

**KENDRIYA VIDYALAYA SANGATHAN**  
**(AGRA REGION)**



**QUESTION BANK/VIDEO LECTURE LINKS**

**INFORMATICS PRACTICES**

**CLASS XII**

**SESSION-2026-27**



## संदेश

मुझे यह जानकर अत्यन्त हर्ष हो रहा है कि केन्द्रीय विद्यालय संगठन, क्षेत्रीय कार्यालय आगरा के मार्गदर्शन में कक्षा 12 इन्फार्मेटिक्स प्रैक्टिसेज प्रश्न बैंक तैयार किया गया है। यह प्रश्न बैंक विद्यार्थियों की शैक्षिक आवश्यकताओं को ध्यान में रखते हुए तैयार किया गया है ताकि वे आत्मविश्वास के साथ बोर्ड परीक्षा में सफलता प्राप्त कर सकें।

इन्फार्मेटिक्स प्रैक्टिसेज एक ऐसा विषय है जिसमें सैद्धांतिक समझ के साथ-साथ व्यावहारिक ज्ञान भी अत्यन्त आवश्यक है। इस प्रश्न बैंक के माध्यम से विद्यार्थियों को विभिन्न प्रकार के प्रश्नों का अभ्यास करने का अवसर मिलेगा, जिससे उनकी तार्किक क्षमता, समस्या समाधान कौशल तथा विश्लेषणात्मक सोच का विकास होगा।

मैं इस प्रश्न बैंक के निर्माण में योगदान देने वाले सभी विषय विशेषज्ञों, शिक्षकों एवं अकादमिक दल के प्रति हार्दिक आभार व्यक्त करती हूँ, जिनके समर्पण और परिश्रम से यह संकलन सम्भव हो पाया है।

मैं सभी विद्यार्थियों से अपेक्षा करती हूँ कि वे इस प्रश्न बैंक का नियमित अभ्यास करें, विषय को जिज्ञासा एवं लगन के साथ समझें तथा आत्मविश्वास के साथ परीक्षा में सफलता प्राप्त करें। मुझे पूर्ण विश्वास है कि यह प्रयास विद्यार्थियों को उत्कृष्ट परिणाम दिलाने में सहायक सिद्ध होगा।

सभी विद्यार्थियों को उज्ज्वल भविष्य के लिए मेरी शुभकामनाएँ।

(श्रीमती इन्दिरा मुद्गल)  
उपायुक्त  
केन्द्रीय विद्यालय संगठन  
क्षेत्रीय कार्यालय, आगरा

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**MRS. RAJNI KARDAM, PGT CS, PM SHRI KENDRIYA VIDYALAYA, KV GREATER NOIDA**

**MRS. NEELAM GUPTA, PGT CS, PM SHRI KENDRIYA VIDYALAYA, BAAD MATHURA**

## CONTENT PREPARATION TEAM

| S.No. | Name of Teacher with KV Name              | Topic Assigned                                            |
|-------|-------------------------------------------|-----------------------------------------------------------|
| 1     | Mr. Sachin Kumar<br>Etah                  | Data Handling using Pandas and<br>Data Visualization      |
| 2     | Mr. Shekhar Godala<br>Jhansi Cantt No. 1  | Data Handling using Pandas and<br>Data Visualization      |
| 3     | Mr. Mitra Bhushan<br>Agra Cantt No. 2     | Database Query using SQL                                  |
| 4     | Mr. Vipin Kumar<br>Noida Sec-24 (Shift-2) | Introduction to Computer<br>Networks and Societal Impacts |

### Video Lecture Links

**CLASS: XII**

**SUBJECT: (065) INFORMATICS PRACTICES**

| S.N. | NAME OF TEACHER<br>WITH KV NAME        | TOPIC                                      | VIDEO LINK                                                                                                                                                                                                                                                                                                                                                                         |
|------|----------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Mr. Harendra Singh<br>Agra No.1 AFS    | Data Handling using<br>Pandas (Series)     | <a href="https://www.youtube.com/watch?v=IHuOtdxixmg">https://www.youtube.com/watch?v=IHuOtdxixmg</a>                                                                                                                                                                                                                                                                              |
| 2    | Mr. Harendra Singh<br>Agra No.1 AFS    | Data Handling using<br>Pandas (Data Frame) | <a href="https://www.youtube.com/watch?v=wHLzfk3OGtQ">https://www.youtube.com/watch?v=wHLzfk3OGtQ</a>                                                                                                                                                                                                                                                                              |
| 3    | Mr. Beena Rani<br>Mathura Cantt        | Data Visualization                         | <a href="https://drive.google.com/drive/folders/1Aj1ZEaj7LgCvSdPflab43Br94Vct_wMh?usp=drive_link">https://drive.google.com/drive/folders/1Aj1ZEaj7LgCvSdPflab43Br94Vct_wMh?usp=drive_link</a>                                                                                                                                                                                      |
| 4    | Mrs. Rajni Kardam<br>KV Greater Noida  | Database Query using<br>SQL                | <a href="https://www.youtube.com/watch?v=XoUF5VyG4-M">https://www.youtube.com/watch?v=XoUF5VyG4-M</a><br>(Part 1 of 2)<br><a href="https://www.youtube.com/watch?v=lrewSI3yIUe">https://www.youtube.com/watch?v=lrewSI3yIUe</a><br>(Part 2 of 2)                                                                                                                                   |
| 5    | Mr. Sachin Bhardwaj<br>NO.1 AFS Hindan | Introduction to<br>Computer Networks       | <a href="https://www.youtube.com/watch?v=i5PrPW-Xck4">https://www.youtube.com/watch?v=i5PrPW-Xck4</a><br>(Part 1 of 3)<br><br><a href="https://www.youtube.com/watch?v=NtXwdwNvM9o">https://www.youtube.com/watch?v=NtXwdwNvM9o</a><br>(Part 2 of 3)<br><br><a href="https://www.youtube.com/watch?v=w3H3oSzZZPc">https://www.youtube.com/watch?v=w3H3oSzZZPc</a><br>(Part 3 of 3) |
| 6    | Mr. Beena Rani<br>Mathura Cantt        | Societal Impacts                           | <a href="https://drive.google.com/file/d/1ifVmpfjAewLQ4wjocy5ZR_U3j5SFE9pko/view?usp=drive_link">https://drive.google.com/file/d/1ifVmpfjAewLQ4wjocy5ZR_U3j5SFE9pko/view?usp=drive_link</a>                                                                                                                                                                                        |

**Topic: Data Handling using Pandas and Data Visualization**  
**Question Type: MCQ (Multiple Choice Questions/Fill in the Blank)**

| Q.N. | Questions                                                                                                                                                                       | Marks |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1   | Which attribute is used to get total number of elements in a Series?<br>a. size                                  b. itemsize<br>c. shape                                d. ndim | 1     |
| Q2   | To display last five rows of a series object 'S', you may write:<br>a. S.Head()<br>b. S.Tail(5)<br>c. S.Head(5)<br>d. S.tail()                                                  | 1     |
| Q3   | To display top five rows of a series object 'S', you may write:<br>a. S.head()<br>b. S.Tail(5)<br>c. S.Head(5)<br>d. S.tail()                                                   | 1     |
| Q4   | _____method in Pandas can be used to change the index of rows and columns of a Series or DataFrame:<br>a. rename()    b. reindex()    c. reframe()    d. none of the above      | 1     |
| Q5   | CSV stands for _____                                                                                                                                                            | 1     |
| Q6   | Pandas Series is: _____<br>a. 2-Dimensional b. 3-Dimensional c. 1 Dimensional d. Multidimensional                                                                               | 1     |
| Q7   | Python pandas was developed by:_____<br>a. Guido van Rossum    b. Travis Oliphant<br>c. Wes McKinney        d. Brendan Eich                                                     | 1     |
| Q8   | The command to install the pandas is:<br>a. install pip pandas    b. install pandas<br>c. pip pandas             d. pip install pandas                                          | 1     |

|     |                                                                                                                                                                                                                                                                                                              |   |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q9  | The name “Pandas” is derived from the term:<br>a. Panel Data                      b. Panel Series<br>c. Python Document              d. Panel Data Frame                                                                                                                                                     | 1 |
| Q10 | We can analyse the data in pandas with<br>a. Series                              b. Data Frame<br>c. Both of the above      d. None of the above                                                                                                                                                             | 1 |
| Q11 | Pandas is a: _____<br>a. Package      b. Language<br>c. Library      d. Software                                                                                                                                                                                                                             | 1 |
| Q12 | Which of the following import statement is not correct?<br>a. import pandas as CLASS12                      b. import pandas as 1pd<br>c. import pandas as pd1                              d. import pandas as pd                                                                                           | 1 |
| Q13 | Which of the following is not an attribute of pandas data frame?<br>a. length              b. T<br>c. Size                  d. shape                                                                                                                                                                         | 1 |
| Q14 | import pandas as pd<br>s=pd.Series([1,2,3,4,5], index=['akram','brijesh','charu','deepika','era'])<br>print(s['charu'])<br>a. 1              b. 2                      c. 3                      d. 4                                                                                                        | 1 |
| Q15 | Difference between loc() and iloc():<br>a. Both are Label indexed based functions.<br>b. Both are Integer position-based functions.<br>c. loc() is label-based function and iloc() integer position-based function.<br>d. loc() is integer position-based function and iloc() index position-based function. | 1 |

### Answers-

| QN.   | Answers     | Marks |
|-------|-------------|-------|
| Ans.1 | a. Size     | 1     |
| Ans.2 | d. s.tail() | 1     |
| Ans.3 | a. s.head() | 1     |

|        |                                                                                                        |   |
|--------|--------------------------------------------------------------------------------------------------------|---|
| Ans.4  | b. <code>reindex()</code>                                                                              | 1 |
| Ans.5  | Comma separated value                                                                                  | 1 |
| Ans.6  | c. 1 Dimensional                                                                                       | 1 |
| Ans.7  | c. Wes McKinney                                                                                        | 1 |
| Ans.8  | d. <code>pip install pandas</code>                                                                     | 1 |
| Ans.9  | a. Panel Data                                                                                          | 1 |
| Ans.10 | c. Both of the above                                                                                   | 1 |
| Ans.11 | c. Library                                                                                             | 1 |
| Ans.12 | b. <code>import pandas as pd</code>                                                                    | 1 |
| Ans.13 | a. length                                                                                              | 1 |
| Ans.14 | c. 3                                                                                                   | 1 |
| Ans.15 | c. <code>loc()</code> is label based function and <code>iloc()</code> integer position based function. | 1 |

### Question Type: MCQ (Multiple Choice Questions)

| Q.N. | Questions                                                                                                                                                                        | Marks |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1   | Which of the following best describes Pandas?<br>(a) Data visualization library      (b) Data manipulation and analysis library<br>(c) Networking library      (d) GUI library   | 1     |
| Q2   | A Series in Pandas is most similar to:<br>(a) Row of a table      (b) Column of a table<br>(c) Whole table      (d) SQL query                                                    | 1     |
| Q3   | Which method is used to view the first 5 rows of a DataFrame?<br>(a) <code>df.top()</code> (b) <code>df.head()</code><br>(c) <code>df.start()</code> (d) <code>df.first()</code> | 1     |
| Q4   | In Pandas, what is the default index when none is specified?<br>(a) 1,2,3...      (b) 0,1,2...<br>(c) A,B,C...      (d) None                                                     | 1     |
| Q5   | Which of the following is not a valid way to create a DataFrame?<br>(a) From dictionary of lists      (b) From list of dictionaries                                              | 1     |

|     |                                                                                                                                                                                                      |   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (c) From Excel/CSV file                      (d) From HTML tags directly                                                                                                                             |   |
| Q6  | Which method is used to remove a column from a DataFrame?<br>(a) df.remove()                      (b) df.del()<br>(c) df.drop()                      (d) df.delete()                                 | 1 |
| Q7  | The command df.loc[2,'Marks'] will:<br>(a) Select the 2nd row and all columns<br>(b) Select row with index label 2 and column 'Marks'<br>(c) Select 2nd column and row 'Marks'<br>(d) Throw an error | 1 |
| Q8  | Which function gives the dimensions (rows × columns) of a DataFrame?<br>(a) df.dim()                      (b) df.shape<br>(c) df.size                      (d) df.length()                           | 1 |
| Q9  | df.iloc[0:3] will select:<br>(a) Rows 0,1,2                      (b) Rows 0,1,2,3<br>(c) Rows 1,2,3                      (d) Row 3 only                                                              | 1 |
| Q10 | Which of the following functions can be applied on a Series?<br>(a) sum(), mean()                      (b) head(), tail()<br>(c) max(), min()                      (d) All of the above              | 1 |
| Q11 | Which Python library is mainly used for data visualization?<br>(a) Seaborn                      (b) Matplotlib<br>(c) Tkinter                      (d) Numpy                                         | 1 |
| Q12 | In Matplotlib, which function is used to display the graph?<br>(a) plt.display()                      (b) plt.show()<br>(c) plt.graph()                      (d) plt.plot()                          | 1 |
| Q13 | Which type of graph is best suited for showing the distribution of marks of students?<br>(a) Line graph                      (b) Bar graph<br>(c) Histogram                      (d) Pie chart       | 1 |
| Q14 | In plt.plot(x,y, marker='o', color='r'), what does 'r' represent?<br>(a) Round marker                      (b) Red color<br>(c) Right side axis                      (d) Row line                    | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                            |   |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q15 | <p>The function <code>plt.savefig("output.png")</code> is used to:</p> <p>(a) Save graph as image file                      (b) Save Python program</p> <p>(c) Save DataFrame                                      (d) Save CSV file</p>                                                                                                                                                   | 1 |
| Q16 | <p>If</p> <pre><b>s = pd.Series([10,20,30], index=['a','b','c'])</b> <b>print(s['b'])</b></pre> <p>The output will be:</p> <p>(a) 10                                                              (b) 20</p> <p>(c) 30                                                              (d) Error</p>                                                                                          | 1 |
| Q17 | <p>Consider:</p> <pre><b>df = pd.DataFrame({'Name': ['Aman','Riya','Raj'], 'Marks': [85,92,78]})</b> <b>print(df.loc[1,'Marks'])</b></pre> <p>The output is:</p> <p>(a) Aman                                                              (b) 92</p> <p>(c) Raj                                                                      (d) Error</p>                                         | 1 |
| Q18 | <p>Given a DataFrame <code>df</code> with column Salary, which command will select all rows with Salary &gt; 50000?</p> <p>(a) <code>df[Salary &gt; 50000]</code>                                      (b) <code>df['Salary'] &gt; 50000</code></p> <p>(c) <code>df[df['Salary'] &gt; 50000]</code>                                      (d) <code>df.select(Salary &gt; 50000)</code></p> | 1 |
| Q19 | <p>If <b><code>df.shape = (5,3)</code></b>, then DataFrame has:</p> <p>(a) 5 columns and 3 rows                                      (b) 3 columns and 5 rows</p> <p>(c) 15 rows                                                              (d) None of these</p>                                                                                                                        | 1 |
| Q20 | <p>Suppose <code>df['Marks'] = [80,90,70,85]</code>, then <code>df['Marks'].mean()</code> gives:</p> <p>(a) 85                                                              (b) 81.25</p> <p>(c) 82.5                                                              (d) 80</p>                                                                                                              | 1 |
| Q21 | <p>Consider:</p> <pre><b>x=[1,2,3]</b> <b>y=[2,4,6]</b> <b>plt.plot(x,y)</b> <b>plt.show()</b></pre>                                                                                                                                                                                                                                                                                       | 1 |



|     |                                                                                                                                                                                                                                                                                                                                           |   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (A) Pandas<br>(C) Matplotlib<br>(B) Numpy<br>(D) Tkinter                                                                                                                                                                                                                                                                                  |   |
| Q29 | Consider the following Series in Python:<br><code>data = pd.Series([5, 2, 3, 7], index = ['a', 'b', 'c', 'd'])</code><br>Which Statement will display all odd values?<br>(A) <code>print(data%2==0)</code><br>(B) <code>print(data(data%2!=0))</code><br>(C) <code>print(data mod 2!=0)</code><br>(D) <code>print(data[data%2!=0])</code> | 1 |
| Q30 | Python Pandas was developed by:<br>(A) Guido van Rossum<br>(B) Travis Oliphant<br>(C) Wes McKinney<br>(D) Brendan Eich                                                                                                                                                                                                                    | 1 |
| Q31 | The name "Pandas" is derived from the term:<br>(A) Panel Data<br>(B) Panel Series<br>(C) Python Document<br>(D) Panel Data Frame                                                                                                                                                                                                          | 1 |
| Q32 | The command to install the Pandas is:<br>(A) Install pip pandas<br>(B) Install pandas<br>(C) pip pandas<br>(D) pip install pandas                                                                                                                                                                                                         | 1 |
| Q33 | Pandas Series is:<br>(A) 2 Dimensional<br>(B) 3 Dimensional<br>(C) 1 Dimensional                                                                                                                                                                                                                                                          | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (D) Multi-Dimensional                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |
| Q34 | <p>What will be the output of the given code?</p> <pre>import pandas as pd s = pd.Series([1,2,3,4,5], index=['akram','brijesh','charu','deepika','era']) print(s['charu'])</pre> <p>(A) 1<br/>(B) 2<br/>(C) 3<br/>(D) 4</p>                                                                                                                                                                                                                                                                                                                                                                                                                           | 1 |
| Q35 | <p>A social science teacher wants to use a pandas series to teach about Indian historical monuments and its states. The series should have the monument names as values and state names as indexes which are stored in the given lists, as shown in the code. Choose the statement which will create the series:</p> <pre>import pandas as pd Monument=['Qutub Minar','Gateway of India', 'Red Fort', 'Taj Mahal'] State=['Delhi','Maharashtra','Delhi','Uttar Pradesh']</pre> <p>(A) S=df.Series(Monument,index=State)<br/>(B) S=pd.Series(State, Monument)<br/>(C) S=pd.Series(Monument,index=State)<br/>(D) S=pd.series (Monument,index=State)</p> | 1 |
| Q36 | <p>Identify the correct option to select first four rows and second to fourth columns from a DataFrame 'Data':</p> <p>(A) display(Data.iloc[1: 4, 2: 4])<br/>(B) display(Data.iloc[1: 5, 2: 5])<br/>(C) print(Data.iloc[0: 4, 1: 4])<br/>(D) print(Data.iloc[1: 4, 2: 4])</p>                                                                                                                                                                                                                                                                                                                                                                         | 1 |
| Q37 | <p>The data of any CSV file can be shown in which of the following software?</p> <p>(A) MS Word<br/>(B) Notepad<br/>(C) Speadsheet</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (D) All of the above                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |
| Q38 | Which method is used to delete row(s) from DataFrame?<br>(A) drop() method<br>(B).del() method<br>(C) .remove() method<br>(D) .delete() method                                                                                                                                                                                                                                                                                                                       | 1 |
| Q39 | Which of the following statement is wrong in context of DataFrame?<br>(A) Two dimensional size is Mutable.<br>(B) Can perform Arithmetic operations on rows and columns.<br>(C) Homogeneous tabular data structure.<br>(D) Create Data Frame from numpy ndarray.                                                                                                                                                                                                     | 1 |
| Q40 | Which attribute is not used with DataFrame?<br>(A) size<br>(B) type<br>(C) empty<br>(D) columns                                                                                                                                                                                                                                                                                                                                                                      | 1 |
| Q41 | Which command will be used to delete 3 and 5 rows of the data frame, assuming the data frame name as DF.<br>(A) DF.drop([2,4],axis=0)<br>(B) DF.drop([2,4],axis=1)<br>(C) DF.drop([3,5],axis=1)<br>(D) DF.drop([3,5])                                                                                                                                                                                                                                                | 1 |
| Q42 | Sudhanshu has written the following code to create a DataFrame with boolean index:<br><b>import numpy as np</b><br><b>import pandas as pd</b><br><b>df = pd.DataFrame (data=[[5, 6, 7]], index= [true, false, True])</b><br><b>print (df)</b><br>While executing the code, she is getting an error, help her to rectify the code:<br>(A) df = pd.DataFrame([True, False. True],data =[ 5 , 6,7])<br>(B) df=pd.DataFrame(data =[ 5, 6 , 7],index=[True, False, True]) | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                      |   |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (C) df=pd.DataFrame([True,false,true],data =[ 5, 6 , 7])<br>(D) df = pd.DataFrame(index=[true/false,true]                                                                                                                                                                                                                                                                                                            |   |
| Q43 | Mr. Raman created a DataFrame from a Numpy array:<br><b>arr = np.array ([[2, 4, 8, ], [3, 9, 27], [4, 16, 64]])</b><br><b>df = pd.DataFrame (arr,index = ['one','two',three'],)</b><br><b>print(df)</b><br>Help him to add a customized column labels to the above DataFrame<br>(A) columns='no','sq','cube'<br>(B) column=['no','sq',cube']<br>(C) columns=['no','sq','cube']<br>(D) columns=[['no', 'sq', 'cube']] | 1 |
| Q44 | What is the minimum number of arguments required for plot() function in matplotlib?<br>(A) 1<br>(B) 2<br>(C) 3<br>(D) 4                                                                                                                                                                                                                                                                                              | 1 |
| Q45 | What does the df.iloc[ ] function allow you to do in a DataFrame?<br>(A) Select rows and columns by labels<br>(B) Select rows and columns by integer position<br>(C) Filter data based on condition<br>(D) Rename columns in the DataFrame                                                                                                                                                                           | 1 |
| Q46 | State whether the following statement is True or False:<br>The index values associated with the series can be altered by assigning new index values.                                                                                                                                                                                                                                                                 |   |
| Q47 | What is not true about Series in pandas.<br>a. With labelled indexes the value at the end index label is excluded in the output.<br>b. A Series is a one-dimensional array containing a sequence of values.<br>c. Each value has a data label associated with it also called its index.<br>d. Positional index takes an integer value that corresponds to its position in the series starting from 0.                |   |
| Q48 | import matplotlib.pyplot as plt                                                                                                                                                                                                                                                                                                                                                                                      |   |

|     |                                                                                                                                                                                                                            |  |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|     | <p>In the above statement matplotlib is a _____ and pyplot is a ____.</p> <p>a. Module, Library</p> <p>b. Library, Alias name</p> <p>c. Library, Module</p> <p>d. Module, Alias name</p>                                   |  |
| Q49 | <p>Which of the following is the correct way to import the Pandas library in Program?</p> <p>a) import pd as pandas</p> <p>b) import pandas</p> <p>c) from pandas import pd</p> <p>d) from pd import pandas</p>            |  |
| Q50 | <p>Which of the following function is used to save the figure/chart?</p> <p>a) save()</p> <p>b) savefigure()</p> <p>c) savefig()</p> <p>d) None of the above</p>                                                           |  |
| Q51 | <p>The command used to give a heading to a graph using matplotlib is _____</p> <p>(a) plt.show()</p> <p>(b) plt.plot()</p> <p>(c) plt.xlabel()</p> <p>(d) plt.title()</p>                                                  |  |
| Q52 | <p>What does CSV stands for:-</p> <p>a) Comma Support Variables</p> <p>b) Comma Spreadsheet Values</p> <p>c) Comma Seperated Values</p> <p>d) Common Specific Values</p>                                                   |  |
| Q53 | <p>Given a Pandas series called Marks, the command which will display the last 2 rows is :</p> <p>a) print(Marks.tail(2))</p> <p>b) print(Marks.Tail(2))</p> <p>c) print(Marks.tails(3))</p> <p>d) print(Marks.tail())</p> |  |

|     |                                                                                                                                                                                                                                                   |  |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Q54 | To create an empty Series object, you can use:<br>(a) pd.Series(empty)<br>(b) pd.Series( )<br>(c) pd.Series(np.NaN)<br>(d) all of these                                                                                                           |  |
| Q55 | In order to draw charts in Python, which of the following statement will be used:<br>(A) import pyplot.matplotlib as pl<br>(B) import matplotlib.pyplot as plt<br>(C) Import matplotlib.pyplot as plt<br>(D) import pyplot from matplotlib as plt |  |

### Answers:

|     |     |     |     |     |      |     |     |     |     |
|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|
| Q1  | Q2  | Q3  | Q4  | Q5  | Q6   | Q7  | Q8  | Q9  | Q10 |
| B   | B   | B   | B   | D   | C    | B   | B   | A   | D   |
| Q11 | Q12 | Q13 | Q14 | Q15 | Q16  | Q17 | Q18 | Q19 | Q20 |
| B   | B   | C   | B   | A   | B    | B   | C   | B   | B   |
| Q21 | Q22 | Q23 | Q24 | Q25 | Q26  | Q27 | Q28 | Q29 | Q30 |
| B   | A   | B   | B   | A   | A    | A   | D   | D   | C   |
| Q31 | Q32 | Q33 | Q34 | Q35 | Q36  | Q37 | Q38 | Q39 | Q40 |
| A   | D   | C   | C   | C   | C    | D   | A   | C   | B   |
| Q41 | Q42 | Q43 | Q44 | Q45 | Q46  | Q47 | Q48 | Q49 | Q50 |
| A   | B   | C   | A   | B   | TRUE | A   | C   | B   | C   |
| Q51 | Q52 | Q53 | Q54 | Q55 |      |     |     |     |     |
| D   | C   | A   | B   | B   |      |     |     |     |     |

### Question Type: MCQ (Multiple Choice Questions)

| Q.N. | Questions                                                                                                                                                                                                                                                                                                                                                                                                                             | Marks |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1   | <p>What is true about Data Visualization?</p> <p>A. Data Visualization is used to communicate information clearly and efficiently to users by the usage of information graphics such as tables and charts.</p> <p>B. Data Visualization helps users in analyzing a large amount of data in a simpler way.</p> <p>C. Data Visualization makes complex data more accessible, understandable, and usable.</p> <p>D. All of the above</p> |       |
| Q2   | <p>Which method is used to save the output of pyplot in the form of image file ?</p> <p>A. savefig('filename')</p> <p>B. save_fig('filename')</p> <p>C. save_figure('filename')</p> <p>D. save_img('filename')</p>                                                                                                                                                                                                                    |       |
| Q3   | <p>Data visualization is also an element of the broader _____.</p> <p>A. deliver presentation architecture</p> <p>B. data presentation architecture</p> <p>C. dataset presentation architecture</p> <p>D. data process architecture</p>                                                                                                                                                                                               |       |
| Q4   | <p>The command used to give a heading to a graph is</p> <p>A. plt.show()</p> <p>B. plt.plot()</p> <p>C. plt.xlabel()</p> <p>D. plt.title()</p>                                                                                                                                                                                                                                                                                        |       |
| Q5   | <p>Common use cases for data visualization include?</p> <p>A. Politics</p> <p>B. Sales and marketing</p> <p>C. Healthcare</p> <p>D. All of the above</p>                                                                                                                                                                                                                                                                              |       |

|     |                                                                                                                                                                                                                                                                                                    |  |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Q6  | Which are pros of data visualization?<br>A. It can be accessed quickly by a wider audience.<br>B. It can misrepresent information<br>C. It can be distracting<br>D. None Of the above                                                                                                              |  |
| Q7  | Which are cons of data visualization?<br>A. It conveys a lot of information in a small space.<br>B. It makes your report more visually appealing.<br>C. Visual data is distorted or excessively used.<br>4. None Of the above                                                                      |  |
| Q8  | Identify the right type of chart using the following hints.<br>Hint 1: This chart is often used to visualize a trend in data over intervals of time.<br>Hint 2: The line in this type of chart is often drawn chronologically.<br>A. Line chart<br>B. Bar chart<br>C. Pie chart<br>D. Scatter plot |  |
| Q9  | Which method is used to plot horizontal bar graph in pyplot ?<br>A. horizontal_bar()<br>B. barh()<br>C. hbar()<br>D. bar()                                                                                                                                                                         |  |
| Q10 | Which method is used to plot histogram in pyplot?<br>A. his()<br>B. hist()<br>C. Hist()<br>D. histogram()                                                                                                                                                                                          |  |

### Answers-

| QN.   | Answers                | Marks |
|-------|------------------------|-------|
| Ans.1 | D) All of the above    | 1     |
| Ans.2 | A) savefig('filename') | 1     |

|        |                                                    |   |
|--------|----------------------------------------------------|---|
| Ans.3  | B) data presentation architecture                  | 1 |
| Ans.4  | D) plt.title()                                     | 1 |
| Ans.5  | D) All of the above                                | 1 |
| Ans.6  | A) It can be accessed quickly by a wider audience. | 1 |
| Ans.7  | C) visual data is distorted or excessively used.   | 1 |
| Ans.8  | A) Line chart                                      | 1 |
| Ans.9  | D) bar()                                           | 1 |
| Ans.10 | B) hist()                                          | 1 |

### **Question Type: Assertion & Reason Type Questions**

- A. Both A and R are true, and R is the correct explanation of A
- B. Both A and R are true, but R is not the correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

| Q.N. | Questions                                                                                                                                                       | Marks |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1   | Assertion (A): A Pandas Series can hold heterogeneous data types.<br>Reason (R): Each element of a Series may belong to a different datatype.                   | 1     |
| Q2   | Assertion (A): A Pandas DataFrame is a two-dimensional labelled data structure.<br>Reason (R): A DataFrame can be considered as a dictionary of Series objects. | 1     |
| Q3   | Assertion (A): The default index of a Series starts from 1.<br>Reason (R): By default, Pandas assigns integer index starting from 0.                            | 1     |
| Q4   | Assertion (A): In Pandas, df.loc[2] accesses data using index labels.<br>Reason (R): .iloc[] is used for accessing rows/columns by integer positions.           | 1     |
| Q5   | Assertion (A): df.head(3) displays the first three rows of a DataFrame.<br>Reason (R): The method df.tail(3) displays the last three rows.                      | 1     |
| Q6   | Assertion (A): In Pandas, drop() function is used to remove rows or columns.<br>Reason (R): Setting axis=1 removes a row from the DataFrame.                    | 1     |
| Q7   | Assertion (A): rename() method in Pandas is used to change column or row labels.                                                                                | 1     |

|     |                                                                                                                                                                                                   |   |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | Reason (R): <code>df.rename(columns={'old':'new'})</code> changes column names.                                                                                                                   |   |
| Q8  | Assertion (A): CSV files can be imported using <code>pd.read_csv()</code> .<br>Reason (R): <code>df.to_csv()</code> is used to export a DataFrame to a CSV file.                                  | 1 |
| Q9  | Assertion (A): Matplotlib is used for data visualization in Python.<br>Reason (R): Functions like <code>plot()</code> , <code>bar()</code> , and <code>hist()</code> are available in Matplotlib. | 1 |
| Q10 | Assertion (A): Line graphs are best suited for comparing categories.<br>Reason (R): Bar graphs are used for showing trends over time.                                                             | 1 |
| Q11 | Assertion (A): <code>plt.plot(x,y)</code> draws a line graph with x on the X-axis and y on the Y-axis.<br>Reason (R): <code>plt.bar(x,y)</code> draws vertical or horizontal bars for comparison. | 1 |
| Q12 | Assertion (A): Histograms are suitable for showing frequency distribution of continuous data.<br>Reason (R): <code>plt.hist(data, bins=5)</code> divides the data into 5 equal intervals.         | 1 |
| Q13 | Assertion (A): <code>plt.title("Graph")</code> is used to give title to a graph.<br>Reason (R): <code>plt.xlabel("X")</code> and <code>plt.ylabel("Y")</code> are used to label the axes.         | 1 |
| Q14 | Assertion (A): In Matplotlib, <code>plt.savefig("graph.png")</code> saves the graph in PNG format.<br>Reason (R): The function <code>plt.show()</code> is used to save the graph file.            | 1 |
| Q15 | Assertion (A): A Pandas Series is mutable.<br>Reason (R): We can change, add, or delete elements in a Series after creation.                                                                      | 1 |
| Q16 | Assertion (A): DataFrame supports both homogeneous and heterogeneous data.<br>Reason (R): Each column of a DataFrame can have a different datatype.                                               | 1 |
| Q17 | Assertion (A): <code>df.shape</code> returns the number of rows and columns of a DataFrame.<br>Reason (R): <code>df.columns</code> returns the number of rows in a DataFrame.                     | 1 |
| Q18 | Assertion (A): Boolean indexing is used for conditional data selection in Pandas.<br>Reason (R): <code>df[df['Marks'] &gt; 80]</code> gives all rows where Marks are greater than 80.             | 1 |
| Q19 | Assertion (A): In Matplotlib, <code>legend()</code> is used to display legends on a graph.<br>Reason (R): Legends describe different plots in the same graph.                                     | 1 |
| Q20 | Assertion (A): A Pandas DataFrame can be created from a dictionary.<br>Reason (R): Each key of the dictionary becomes a column in the DataFrame.                                                  | 1 |
| Q21 | Assertion (A): When using a dictionary to create a Data Frame, values of the Dictionary become the column labels of the Data Frame.                                                               | 1 |

|     |                                                                                                                                                                                                                                         |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | Reason (R): A Data Frame can be thought of as a dictionary of lists/ Series.                                                                                                                                                            |   |
| Q22 | Assertion (A): Like iterations in Python, we can also iterate over DataFrames.<br>Reason (R): There are many ways using which we can iterate over a DataFrame                                                                           | 1 |
| Q23 | ASSERTION (A): The shape attribute returns the number of rows and number of columns available in data frame.<br>REASONING (R): The shape attribute returns the values in form of list.                                                  | 1 |
| Q24 | Assertion (A):- While creating a dataframe with a nested or 2D dictionary, Python interprets the outer dict keys as the columns and the inner keys as the row indices.<br>Reasoning (R):- A column can be deleted using remove command. | 1 |
| Q25 | Assertion (A): You need to import or load the Pandas library first in order to use it.<br>Reason (R): The "pd" is an alias or abbreviation which will be used as a shortcut to access or call pandas functions.                         | 1 |

### Answers:

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Q1  | Q2  | Q3  | Q4  | Q5  | Q6  | Q7  | Q8  | Q9  | Q10 |
| C   | A   | D   | A   | A   | C   | A   | A   | A   | C   |
| Q11 | Q12 | Q13 | Q14 | Q15 | Q16 | Q17 | Q18 | Q19 | Q20 |
| A   | A   | A   | C   | A   | A   | C   | A   | A   | A   |
| Q21 | Q22 | Q23 | Q24 | Q25 | Q26 | Q27 | Q28 | Q29 | Q30 |
| D   | A   | C   | C   | B   |     |     |     |     |     |

### **Question Type: Assertion & Reason Type Questions**

- A. Both A and R are true, and R is the correct explanation of A
- B. Both A and R are true, but R is not the correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

| Q.N. | Questions                                                                                                                                                                                                                                    | Marks |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1    | Assertion (A): DataFrame is a two-dimensional labelled array. Its columns types can be heterogeneous i.e., of varying types.<br>Reason (R): We need a DataFrame with a Boolean index to use the Boolean indexing.                            | 1     |
| 2    | Assertion (A): Iteration is a general term for taking each item of something one after another.<br>Reason (R): <code>itertuples()</code> returns the iterator yielding each index value along with a series containing the data in each row. | 1     |
| 3    | Assertion (A): Indexing can also be known as sub selection.<br>Reason (R): Pandas DataFrame.loc attribute access group of rows and columns by label(s) or a boolean array in the given DataFrame.                                            | 1     |
| 4    | Assertion (A): To delete a column from Panda DataFrame, <code>drop()</code> method is used.<br>Reason (R): Columns are deleted by dropping columns with index label.                                                                         | 1     |
| 5    | Assertion (A): Rows can also be selected by passing integer location.<br>Reason (R): Integer location can be pass to the <code>iloc[]</code> method                                                                                          | 1     |
| 6    | Assertion (A): <code>head()</code> function returns first n rows from the object based on position.<br>Reason (R): n is the selected number of rows whose default value is 3.                                                                | 1     |
| 7    | Assertion (A): List of dictionary can be passed to form a DataFrame.<br>Reason (R): Keys of dictionary are taken as row names by default.                                                                                                    | 1     |
| 8    | Assertion (A): Indexing can also be known as sub selection.<br>Reason (R): Pandas DataFrame.loc attribute access group of rows and columns by label(s) or a Boolean array in the given DataFrame.                                            | 1     |

|    |                                                                                                                                                                                                                                                                            |   |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 9  | Assertion (A): CSV files are available to open in any spreadsheet program, including Google Sheets, Open Office, and Microsoft Excel.<br>Reason (R): Using a spreadsheet program can serve a user's needs better since it has cells where data sorted in rows and columns. | 1 |
| 10 | Assertion (A):- While creating a DataFrame with a nested or 2D dictionary, Python interprets the outer dict keys as the columns and the inner keys as the row indices.<br>Reasoning (R):- A column can be deleted using remove command                                     | 1 |

### Answers:

| QN | Answers                                                                                                                                                                                                                                                                                                                                                                                                                                   | Marks |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1  | Ans. Option (C) is correct.<br>C) Assertion (A) is true, but Reason (R) is false.                                                                                                                                                                                                                                                                                                                                                         | 1     |
| 2  | Ans. Option (C) is correct.<br>Explanation: Iteration is the repetition of a process in order to generate an outcome. The sequence will approach some end point or end value. Each repetition of the process is a single iteration, and the outcome of each iteration is then the starting point of the next iteration.<br>iterrows() returns the iterator yielding each index value along with a series containing the data in each row. | 1     |
| 3  | Ans. Option (D) is correct.<br>Explanation: Indexing can also be known as subse selection.<br>loc takes two single/list/range operator separated by 7. The first one indicates the row and the second one indicates columns.                                                                                                                                                                                                              | 1     |
| 4  | Ans. Option (C) is correct.<br>Explanation: To delete a column from Pandas DataFrame, drop() method is used. Columns are deleted by dropping columns with column names.                                                                                                                                                                                                                                                                   | 1     |
| 5  | Ans. Option (B) is correct.<br>Explanation: To retrieve rows from a DataFrame, a special method is used named DataFrame.loc[]. Rows can also be selected by passing                                                                                                                                                                                                                                                                       | 1     |

|    |                                                                                                                                                                                                                                                                                                                                                                |   |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|    | integer location to <code>iloc[]</code> method.                                                                                                                                                                                                                                                                                                                |   |
| 6  | <p>Ans. Option (C) is correct.</p> <p>Explanation: <code>head()</code> function returns first n rows from the object based on position. It is useful for quickly verifying data. for example, after sorting Syntax, <code>DataFrame.head(n = 5)</code><br/>Here, n is the selected number of rows whose default value is 5.</p>                                | 1 |
| 7  | <p>Ans. Option (C) is correct.</p> <p>Explanation: List of dictionary can be passed to form a DataFrame. Keys of dictionary are taken</p>                                                                                                                                                                                                                      | 1 |
| 8  | <p>Ans. Option (D) is correct.</p> <p>Explanation: Indexing can also be known as subse selection.<code>loc</code> takes two single/list/range operator separated by <code>:</code>. The first one indicates the row and the second one indicates columns.</p>                                                                                                  | 1 |
| 9  | <p>Ans. Option (A) is correct.</p> <p>Explanation: A CSV file stores data, both numbers and text in a plain text. All fields are separated by commas while all records are separated by an elaborate line of characters. A spreadsheet program sorts the data in a CSV file systematically via columns. This helps to filter all the contents in the file.</p> | 1 |
| 10 | Ans. Option (C) is correct.                                                                                                                                                                                                                                                                                                                                    | 1 |

### **Question Type: Short Type Questions-1**

| Q.N. | Questions                                                                                                                                 | Marks |
|------|-------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1   | Write two differences between a Pandas Series and a DataFrame.                                                                            | 2     |
| Q2   | <p>Consider the Series:</p> <pre><b>import pandas as pd</b> <b>s = pd.Series([12, 25, 36, 48, 60])</b></pre> <p>Write Python code to:</p> | 2     |

|     |                                                                                                                                                                                                                                                                                                                     |   |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (i) Display only the first three elements.<br>(ii) Display the sum of elements.                                                                                                                                                                                                                                     |   |
| Q3  | What will be the output of the following code?<br><b>import pandas as pd</b><br><b>s = pd.Series([10,20,30], index=['a','b','c'])</b><br><b>print(s['b'])</b><br><b>print(s[1])</b>                                                                                                                                 | 2 |
| Q4  | Write two ways of creating a DataFrame in Pandas.                                                                                                                                                                                                                                                                   | 2 |
| Q5  | Given the DataFrame:<br><b>df = pd.DataFrame({'Name':['Riya','Aman','Raj'], 'Marks':[85,92,78], 'Grade':['B','A','C']})</b><br>Write code to:<br>(i) Display only the column Marks.                      (ii) Display the second row using iloc.                                                                    | 2 |
| Q6  | Predict the output:<br><b>import pandas as pd</b><br><b>df = pd.DataFrame({'A':[1,2,3],'B':[4,5,6]})</b><br><b>print(df.shape)</b><br><b>print(df.columns)</b>                                                                                                                                                      | 2 |
| Q7  | What is the difference between loc[] and iloc[] in Pandas?                                                                                                                                                                                                                                                          | 2 |
| Q8  | Write code to rename column Marks to Score in the following DataFrame:<br><b>df = pd.DataFrame({'Name':['A','B'],'Marks':[80,90]})</b>                                                                                                                                                                              | 2 |
| Q9  | Write Python code to import a CSV file named students.csv into Pandas and display the first 5 rows.                                                                                                                                                                                                                 | 2 |
| Q10 | Given a DataFrame df, write code to:<br>(i) Drop column Grade.                      (ii) Drop row with index 2.                                                                                                                                                                                                     | 2 |
| Q11 | Rahul's Python program is supposed to create a DataFrame from a dictionary of lists.<br>However, his code has a few mistakes. Identify and correct the errors:<br><b>Import pandas pd</b><br><b>data = {'Name': [Aman, Isha, Neha], 'Age': [22, 24, 23]}</b><br><b>df = pd.dataframe(data)</b><br><b>print (df)</b> | 2 |

|     |                                                                                                                                                                                                                                                                                                                                                                                 |   |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q12 | <p>Complete the given Python code to create a DataFrame with the following output:</p> <pre> City      Population 0  Mumbai    20400000 1   Delhi    16700000 2  Bengaluru   8400000  import ____ as pd data = {'City': ['Mumbai', 'Delhi', '____'], 'Population': [20400000,16700000, 8400000]} df = pd.____(data) print(____) </pre>                                          | 2 |
| Q13 | <p>What do you understand by the size of</p> <p>(i) A Series</p> <p>(ii) A Data Frame</p>                                                                                                                                                                                                                                                                                       | 2 |
| Q14 | <p>Mitali created following data frame using list of dictionaries, but it shows some errors on execution. Help her to find errors and rewrite the correct code.</p> <pre> import pandas as pd d1={'acc':98,'bst':95,'eco':88} d2={'acc':94,'bst':87,'eco':79} d3={'acc':89,'bst':76,'eco':81} df=pd.DataFrame((d1,d2,d3),index=['Meet','Ram','Smita','Rohan']) print(df) </pre> | 2 |
| Q15 | <p>Write the output of the following code:</p> <pre> import pandas as pd students = pd.Series(['Abhay', 'Ananya', 'Javed']) marks = pd.Series([85, 92, 88]) data = {'Name': students, 'Marks': marks} df = pd.DataFrame(data) df.rename(columns={'Name': 'StuName', 'Marks': 'Score'}, inplace=True) print(df) </pre>                                                           | 2 |
| Q16 | Write the output of the following code:                                                                                                                                                                                                                                                                                                                                         |   |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                      |         |       |          |       |       |       |       |       |        |       |  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------|----------|-------|-------|-------|-------|-------|--------|-------|--|
|          | <pre>import pandas as pd states = pd.Series(['Maharashtra', 'Gujarat', 'Kerala']) capitals = pd.Series(['Mumbai', 'Gandhinagar', 'Thiruvananthapuram']) data = {'State': states, 'Capital': capitals} df = pd.DataFrame(data) df.drop(index=1, inplace=True) print(df)</pre>                                                                                                                                         |         |       |          |       |       |       |       |       |        |       |  |
| Q17      | <p>Ravi wants to create a Pandas Series as shown below:</p> <table><tr><td>January</td><td>31</td></tr><tr><td>February</td><td>28</td></tr><tr><td>March</td><td>31</td></tr></table> <p>Help him in writing the code to achieve the desired output.</p>                                                                                                                                                            | January | 31    | February | 28    | March | 31    |       |       |        |       |  |
| January  | 31                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |          |       |       |       |       |       |        |       |  |
| February | 28                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |          |       |       |       |       |       |        |       |  |
| March    | 31                                                                                                                                                                                                                                                                                                                                                                                                                   |         |       |          |       |       |       |       |       |        |       |  |
| Q18      | <p>Sneha is writing a Python program to create a DataFrame using a list of dictionaries. However, her code contains some mistakes. Identify the errors, rewrite the correct code, and underline the corrections made.</p> <pre>Import Pandas as pd D1 = {'Name': 'Rakshit', 'Age': 25} D2 = {'Name': 'Paul', 'Age': 30} D3 = {'Name': 'Ayesha", 'Age': 28} data = [D1,D2,D3) df = pd.Dataframe(data) print(df)</pre> |         |       |          |       |       |       |       |       |        |       |  |
| Q19      | <p>Write python code to create following series which stores employee names as index and their respective salary as data.</p> <table><tr><td>Meet</td><td>50000</td></tr><tr><td>Ram</td><td>65000</td></tr><tr><td>Smita</td><td>68500</td></tr><tr><td>Rohan</td><td>46000</td></tr><tr><td>Riddhi</td><td>56000</td></tr></table>                                                                                 | Meet    | 50000 | Ram      | 65000 | Smita | 68500 | Rohan | 46000 | Riddhi | 56000 |  |
| Meet     | 50000                                                                                                                                                                                                                                                                                                                                                                                                                |         |       |          |       |       |       |       |       |        |       |  |
| Ram      | 65000                                                                                                                                                                                                                                                                                                                                                                                                                |         |       |          |       |       |       |       |       |        |       |  |
| Smita    | 68500                                                                                                                                                                                                                                                                                                                                                                                                                |         |       |          |       |       |       |       |       |        |       |  |
| Rohan    | 46000                                                                                                                                                                                                                                                                                                                                                                                                                |         |       |          |       |       |       |       |       |        |       |  |
| Riddhi   | 56000                                                                                                                                                                                                                                                                                                                                                                                                                |         |       |          |       |       |       |       |       |        |       |  |
| Q20      | How are Data Frames related to Series?                                                                                                                                                                                                                                                                                                                                                                               |         |       |          |       |       |       |       |       |        |       |  |

|                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                              |   |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q21                                                                                                       | <p>Observe the following code and predict the output.</p> <pre> import pandas as pd d1 = {'Item': 'PEN', 'Price': 25} d2 = {'Item': 'PENCIL', 'Price': 10} d3 = {'Item': 'ERASER', 'Price': 5} d4 = {'Item': 'SCALE', 'Price': 20} data = [d1, d2, d3, d4] df = pd.DataFrame(data) print(df) print(df.head(2)) print(df.T) </pre>                                                            |   |
| Q22                                                                                                       | <p>What does the term 'library' signify in Python? Mention one use for each of the following libraries:</p> <p>(i) NumPy                      (ii) Matplotlib</p>                                                                                                                                                                                                                            | 2 |
| Q23                                                                                                       | <p>Amit is writing a Python program to create a DataFrame using list of dictionaries. However, his code contains some mistakes. Identify the errors, rewrite the correct code, and underline the corrections made.</p> <pre> import pandas as pt D1={'Name':'Ram','Age':32} D2={'Name':'Seeta','Age':27} D3={'Name':'Shyam','Age':29} data=[D1,D2,D3] df=pd.Dataframe(data) print(Df) </pre> |   |
| Q24                                                                                                       | <p>Complete the given Python code to get the required output (ignore the dtype attribute) as Output:</p> <pre> New Delhi              New Delhi Madhya Pradesh    Bhopal Tripura                Agartala Code: </pre>                                                                                                                                                                        |   |
| <div> <div>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</div> <div>Page <b>29</b> of <b>183</b></div> </div> |                                                                                                                                                                                                                                                                                                                                                                                              |   |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                              |       |       |         |        |         |       |        |        |           |       |   |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|---------|--------|---------|-------|--------|--------|-----------|-------|---|
|           | <pre>import _____ as pd indx=['New Delhi','Bhopal','_____'] data=['New Delhi', 'Madhya Pradesh', 'Tripura'] s=pd.Series(indx,_____) print(_____)</pre>                                                                                                                                                                                                                                                                       |       |       |         |        |         |       |        |        |           |       |   |
| Q25       | <p>Write a program to create a series object books using a list that stores the number of quantity of books in library of your school.</p> <p>Note: Assume four books' names as index are ["Computer World", "Fun with Mathematics", "Artificial Intelligence", "universe of Physics" having quantities as 30, 25, 20, 2 respectively and also import pandas library properly</p>                                            |       |       |         |        |         |       |        |        |           |       |   |
| Q26       | <p>Sumita is writing a Python program to create a DataFrame using a list of dictionaries. However, her code contains some mistakes. Identify the errors, rewrite the correct code, and underline the corrections made.</p> <p>Import pandas as pd</p> <pre>D1 = ['Name': 'Sumit', 'Age': 35] D2 = {'Name': 'Parul', 'Age': 20} D3 = {'Name': 'Ameesha', 'Age': 38} data = [D1,D2,D3] df = pd.DataFrame(data) print(df)</pre> | 2     |       |         |        |         |       |        |        |           |       |   |
| Q27       | <p>Write a Python Program to create a Pandas Series as shown below using a dictionary. Note that the left column indicates the indices and the right column displays the data.</p> <table border="1"><tr><td>Delhi</td><td>India</td></tr><tr><td>Thimphu</td><td>Bhutan</td></tr><tr><td>Beijing</td><td>China</td></tr><tr><td>Moscow</td><td>Russia</td></tr><tr><td>Kathmandu</td><td>Nepal</td></tr></table>            | Delhi | India | Thimphu | Bhutan | Beijing | China | Moscow | Russia | Kathmandu | Nepal | 2 |
| Delhi     | India                                                                                                                                                                                                                                                                                                                                                                                                                        |       |       |         |        |         |       |        |        |           |       |   |
| Thimphu   | Bhutan                                                                                                                                                                                                                                                                                                                                                                                                                       |       |       |         |        |         |       |        |        |           |       |   |
| Beijing   | China                                                                                                                                                                                                                                                                                                                                                                                                                        |       |       |         |        |         |       |        |        |           |       |   |
| Moscow    | Russia                                                                                                                                                                                                                                                                                                                                                                                                                       |       |       |         |        |         |       |        |        |           |       |   |
| Kathmandu | Nepal                                                                                                                                                                                                                                                                                                                                                                                                                        |       |       |         |        |         |       |        |        |           |       |   |
| Q28       | What is the purpose of the Matplotlib library?                                                                                                                                                                                                                                                                                                                                                                               | 2     |       |         |        |         |       |        |        |           |       |   |
| Q29       | "Series has immutable index". Explain?                                                                                                                                                                                                                                                                                                                                                                                       | 2     |       |         |        |         |       |        |        |           |       |   |
| Q30       | Consider two objects x and y. x is a list whereas y is a series. Both have values 20, 40, 90, 110.                                                                                                                                                                                                                                                                                                                           |       |       |         |        |         |       |        |        |           |       |   |

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What will be the output of the following two statements considering that the above objects have been created already?

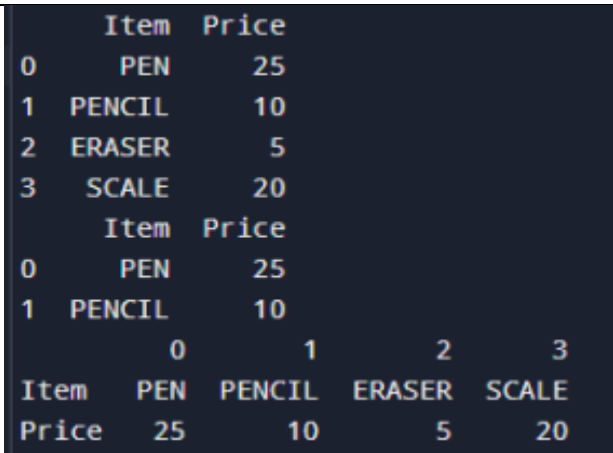
(a) `print (x*2)`

(b) `print (y*2)`

### Answers:

| QN | Answers                                                                                                                                                 | Marks |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1  | Series → 1D labelled array; DataFrame → 2D labelled table.<br>Series has only one column; DataFrame has multiple rows and columns.                      | 2     |
| 2  | (i) <code>s.head(3)</code> (ii) <code>s.sum()</code>                                                                                                    | 2     |
| 3  | Output:<br>20<br>20                                                                                                                                     | 2     |
| 4  | From dictionary of lists.<br>From list of dictionaries.                                                                                                 | 2     |
| 5  | (i) <code>print(df['Marks'])</code> (ii) <code>print(df.iloc[1])</code>                                                                                 | 2     |
| 6  | Output:<br>(3,2)<br><code>Index(['A','B'], dtype='object')</code>                                                                                       | 2     |
| 7  | <code>loc[]</code> → label-based indexing<br><code>iloc[]</code> → integer position-based indexing                                                      | 2     |
| 8  | <code>df.rename(columns={'Marks':'Score'}, inplace=True)</code>                                                                                         | 2     |
| 9  | <code>df = pd.read_csv("students.csv")</code><br><code>print(df.head())</code>                                                                          | 2     |
| 10 | (i) <code>df.drop('Grade', axis=1, inplace=True)</code><br>(ii) <code>df.drop(2, axis=0, inplace=True)</code>                                           | 2     |
| 11 | <code>import pandas as pd</code><br><code>data = {'Name': ['Aman', 'Isha', 'Neha'], 'Age': [22, 24, 23]}</code><br><code>df = pd.DataFrame(data)</code> | 2     |

|                                                                                                           |                                                                                                                                                                                                               |                    |         |         |   |             |        |   |        |                    |   |       |    |   |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------|---------|---|-------------|--------|---|--------|--------------------|---|-------|----|---|
|                                                                                                           | print(df)                                                                                                                                                                                                     |                    |         |         |   |             |        |   |        |                    |   |       |    |   |
| 12                                                                                                        | import pandas as pd<br>data = {'City': ['Mumbai', 'Delhi',<br>'Bengaluru'],'Population':[20400000,16700000,8400000]}<br>df = pd.DataFrame(data)<br>print(df)                                                  | 2                  |         |         |   |             |        |   |        |                    |   |       |    |   |
| 13                                                                                                        | i. Number of values in the Series object<br>ii. A tuple representing the dimensionality of the DataFrame                                                                                                      | 2                  |         |         |   |             |        |   |        |                    |   |       |    |   |
| 14                                                                                                        | import pandas as pd<br>d1={'acc':98,'bst':95,'eco':88}<br>d2={'acc':94,'bst':87,'eco':79}<br>d3={'acc':89,'bst':76,'eco':81}<br>df=pd.DataFrame([d1,d2,d3],index=['Meet','Ram','Smita'])<br>print(df)         | 2                  |         |         |   |             |        |   |        |                    |   |       |    |   |
| 15                                                                                                        | <table> <tr> <td></td><td>StuName</td><td>Score</td></tr> <tr> <td>0</td><td>Abhay</td><td>85</td></tr> <tr> <td>1</td><td>Ananya</td><td>92</td></tr> <tr> <td>2</td><td>Javed</td><td>88</td></tr> </table> |                    | StuName | Score   | 0 | Abhay       | 85     | 1 | Ananya | 92                 | 2 | Javed | 88 | 2 |
|                                                                                                           | StuName                                                                                                                                                                                                       | Score              |         |         |   |             |        |   |        |                    |   |       |    |   |
| 0                                                                                                         | Abhay                                                                                                                                                                                                         | 85                 |         |         |   |             |        |   |        |                    |   |       |    |   |
| 1                                                                                                         | Ananya                                                                                                                                                                                                        | 92                 |         |         |   |             |        |   |        |                    |   |       |    |   |
| 2                                                                                                         | Javed                                                                                                                                                                                                         | 88                 |         |         |   |             |        |   |        |                    |   |       |    |   |
| 16                                                                                                        | <table> <tr> <td></td><td>State</td><td>Capital</td></tr> <tr> <td>0</td><td>Maharashtra</td><td>Mumbai</td></tr> <tr> <td>2</td><td>Kerala</td><td>Thiruvananthapuram</td></tr> </table>                     |                    | State   | Capital | 0 | Maharashtra | Mumbai | 2 | Kerala | Thiruvananthapuram |   |       |    |   |
|                                                                                                           | State                                                                                                                                                                                                         | Capital            |         |         |   |             |        |   |        |                    |   |       |    |   |
| 0                                                                                                         | Maharashtra                                                                                                                                                                                                   | Mumbai             |         |         |   |             |        |   |        |                    |   |       |    |   |
| 2                                                                                                         | Kerala                                                                                                                                                                                                        | Thiruvananthapuram |         |         |   |             |        |   |        |                    |   |       |    |   |
| 17                                                                                                        | import pandas as pd<br>ser_data = {'January': 31, 'February': 28, 'March': 31}<br>s = pd.Series(ser_data)<br>print(s)                                                                                         |                    |         |         |   |             |        |   |        |                    |   |       |    |   |
| 18                                                                                                        | import pandas as pd<br>D1 = {'Name': 'Rakshit', 'Age': 25}<br>D2 = {'Name': 'Paul', 'Age': 30}<br>D3 = {'Name': 'Ayesha', 'Age': 28}<br>data = [D1, D2, D3]                                                   |                    |         |         |   |             |        |   |        |                    |   |       |    |   |
| <div> <div>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</div> <div>Page <b>32</b> of <b>183</b></div> </div> |                                                                                                                                                                                                               |                    |         |         |   |             |        |   |        |                    |   |       |    |   |

|    |                                                                                                                                                                                                                                                                                                           |  |  |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|    | <pre>df = pd.DataFrame(data) print(df)</pre>                                                                                                                                                                                                                                                              |  |  |
| 19 | <pre>import pandas as pd name=[' Meet',' Ram',' Smita',' Rohan',' Riddhi'] s=pd.Series([50000,65000,68500,46000,56000],index=name) print(s)</pre>                                                                                                                                                         |  |  |
| 20 | A DataFrame can be thought of as a table (like an Excel spreadsheet or a SQL table), where each column is a Series. Each Series in a DataFrame represents one column, and all Series in a DataFrame share the same index (the row labels).                                                                |  |  |
| 21 |  <pre> Item Price 0    PEN    25 1  PENCIL    10 2  ERASER     5 3   SCALE    20 Item Price 0    PEN    25 1  PENCIL    10 0      1      2      3 Item  PEN  PENCIL  ERASER  SCALE Price 25     10      5     20 </pre> |  |  |
| 22 | <p>Library: A collection of modules providing functionalities for specific tasks.</p> <p>NumPy is a Python library used for working with arrays.</p> <p>Matplotlib :Used for creating plots</p>                                                                                                           |  |  |
| 23 | <pre>import pandas as <b>pd</b> D1={'Name':"Ram",'Age':32} D2={'Name':"Seeta",'Age':27} D3={'Name':"Shyam",'Age':29} data=[D1,D2,D3] df=pd.Data<b>F</b>rame(data) print(<b>df</b>)</pre>                                                                                                                  |  |  |
| 24 | <pre>import pandas as pd indx=['New Delhi','Bhopal','Agartala'] data=['New Delhi', 'Madhya Pradesh', 'Tripura']</pre>                                                                                                                                                                                     |  |  |

|                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                 |  |  |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|                                                                                                           | <pre>s=pd.Series(indx, data) print(s)</pre>                                                                                                                                                                                                                                                                                                                                     |  |  |
| 25                                                                                                        | <pre>import pandas as pd lib=['Computer World', 'Fun with Mathematics', 'Artificial Intelligence', 'Universe of Physics'] data=[30, 25, 20, 2] books=pd.Series(data, index=lib) print(books)</pre>                                                                                                                                                                              |  |  |
| 26                                                                                                        | <p><b><u>import</u></b> pandas as pd # i will be small in import</p> <p>D1 = {'Name': 'Sumit', 'Age': 35} #Curly brackets will come instead of square bracket</p> <p>D2 = {'Name': 'Parul', 'Age': 20}</p> <p>D3 = {'Name': 'Ameesha', '<b><u>Age</u></b>': 38}</p> <p>data = [D1,D2,D3]</p> <p>df = pd.DataFrame(data) # in DataFrame F should be capital</p> <p>print(df)</p> |  |  |
| 27                                                                                                        | <pre>import pandas as pd data={'Delhi':'India','Thimphu':'Bhutan','Beijing':'China','Moscow':'Russia','Kathmandu':'Ne pal'} country = pd.Series(data) print(country)</pre>                                                                                                                                                                                                      |  |  |
| 28                                                                                                        | <p>Matplotlib provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK+.</p> <p>Matplotlib is designed to be as usable as MATLAB, with the ability to use Python and the advantage of being free and open-source.</p>                                                                        |  |  |
| 29                                                                                                        | <p>Once a series is created, the size or structure of index cannot be changed in place whereas the entire index can be replaced. One cannot add more elements to a series or remove elements from the original series.</p>                                                                                                                                                      |  |  |
| 30                                                                                                        | <p>a) Will give the output as: [20, 40, 90, 110, 20, 40, 90, 110]</p> <p>(b) Will give the output as:</p> <pre>0    40 1    80</pre>                                                                                                                                                                                                                                            |  |  |
| <div> <div>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</div> <div>Page <b>34</b> of <b>183</b></div> </div> |                                                                                                                                                                                                                                                                                                                                                                                 |  |  |

2     180

3     220

Justification: In the first statement, x represents a list so when a list is multiplied by a number, it is replicated that many number of times. The second y represents a series, when a series is multiplied by a value, then each element of the series is multiplied by that number.

### (1- Mark Questions) CBSE BOARD QUESTIONS

|   |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | CBSE<br>Main<br>2026  | In the context of creating a Pandas Series from a dictionary, which of the following statement is correct ?<br><br>(A) The values of the dictionary become the indices of the Series.<br>(B) The keys of the dictionary become the values of the Series.<br>(C) The keys of the dictionary become the indices of the Series.<br>(D) The Series will have default integer indices starting from 0, ignoring the dictionary keys.                           |
| 2 | CBSE<br>Main<br>2026  | In Pandas, when extracting a portion of a Series ser1 using ser1[start:end] with positional indices start and end, which of the following statements is true ?<br><br>(A) The element at the end index is included in the output.<br>(B) The element at the end index is excluded from the output.<br>(C) The elements at both the start and end indices are excluded from the output.<br>(D) The element at the start index is excluded from the output. |
| 3 | CBSE<br>Main<br>2026  | State whether the following statement is True or False :<br><br>In Pandas Series, the Positional index can be a string or an integer.                                                                                                                                                                                                                                                                                                                     |
| 4 | CBSE<br>Compt<br>2026 | State whether the following statement is True or False :<br><br>We need to import the Pandas library to use its data structures.                                                                                                                                                                                                                                                                                                                          |
| 5 | CBSE<br>Compt<br>2026 | State whether the following statement is True or False :<br><br>In Pandas, slicing a Series cannot be done using labelled indexes.                                                                                                                                                                                                                                                                                                                        |
| 6 | CBSE<br>Compt<br>2026 | Aryan is working on a Pandas Series named ser. He has written the code :<br><br>print(ser[::-1])                                                                                                                                                                                                                                                                                                                                                          |

|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                       | <p>This code will print _____</p> <p>(A) Alternate elements<br/>(B) All elements<br/>(C) Last one element<br/>(D) All elements in reverse order</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 7  | CBSE<br>Compt<br>2026 | <p>State whether the following statement is True or False :</p> <p>In Python, Pandas is a high-level data manipulation tool used for analysing data.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 8  | CBSE<br>Compt<br>2026 | <p>In Pandas, what does the term NaN represent ?</p> <p>(A) Not a Name<br/>(B) Nd-array Name<br/>(C) New array Number<br/>(D) Not a Number</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 9  | CBSE<br>Compt<br>2026 | <p>Assertion (A) : While creating a Series from scalar values in Pandas, if the index is not specified, default index starts from 0.<br/>Reason (R) : In a Pandas Series, default indices range from 0 to N-1, where N is the number of data values.</p> <p>Choose the correct option:<br/>(a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).<br/>(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).<br/>(c) Assertion (A) is true, but Reason (R) is false.<br/>(d) Assertion (A) is false, but Reason (R) is true.</p> |
| 10 | CBSE<br>SQP<br>2026   | <p>The default index used in a Pandas Series, if no index is explicitly specified, is _____</p> <p>(A) Strings starting with 'a'<br/>(B) Consecutive integers starting from 1<br/>(C) Random integers<br/>(D) Consecutive integers starting from 0</p>                                                                                                                                                                                                                                                                                                                                                                                         |
| 11 | CBSE<br>SQP           | <p>When two Pandas Series with different indices are added, the result is _____.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

|    |                       |                                                                                                                                                                                                                                                   |
|----|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 2026                  | (A) Error occurs<br>(B) Indices are ignored, and elements are added in order<br>(C) The result has all indices, with missing values filled as NaN<br>(D) Only the common indices are retained in the result                                       |
| 12 | CBSE<br>Main<br>2025  | What is the default index type for a Pandas Series if not explicitly specified ?<br><br>(A) String<br>(B) List<br>(C) Numeric<br>(D) Boolean                                                                                                      |
| 13 | CBSE<br>Main<br>2025  | Which of the following data structure is used for storing one-dimensional labelled data in Python Pandas ?<br><br>(A) Integer<br>(B) Dictionary<br>(C) Series<br>(D) DataFrame                                                                    |
| 14 | CBSE<br>Main<br>2025  | Which of the following Python statements will be used to select a specific element having index as points, from a Pandas Series named ser ?<br><br>(A) ser.element (points)<br>(B) ser.select (points)<br>(C) ser[points]<br>(D) ser.show[points] |
| 15 | CBSE<br>Main<br>2025  | Which of the following libraries defines an ndarray in Python ?<br>(A) pandas<br>(B) numpy<br>(C) matplotlib<br>(D) scipy                                                                                                                         |
| 16 | CBSE<br>Compt<br>2025 | State whether the following statement is True or False :<br><br>"Series data structure of Pandas can hold the value of integer data type only."                                                                                                   |
| 17 | CBSE<br>Compt<br>2025 | To create a Pandas series from an ndarray array1, which of the following statements can be used ?<br>(Note : Assume pd as alias for pandas)                                                                                                       |

|           |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|-----------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------|-------|------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           |                       | (A) pd.array (array1)<br>(B) nd.series (array1)<br>(C) pd.Series (array1)<br>(D)array1.toSeries( )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 18        | CBSE<br>Compt<br>2025 | Assertion (A) : Pandas is a high level data manipulation tool used for analyzing data.<br>Reason (R) : It is very easy to import and export data using the Pandas library which has a very rich set of functions.<br><br>Choose the correct option:<br>(a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).<br>(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).<br>(c) Assertion (A) is true, but Reason (R) is false.<br>(d) Assertion (A) is false, but Reason (R) is true.                                                                                                 |           |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 19        | CBSE<br>SQP<br>2025   | State whether the following statement is True or False:<br><br>Slicing can be used to extract a specific portion from a Pandas Series.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 20        | CBSE<br>SQP<br>2025   | While creating a Series using a dictionary, the keys of the dictionary become:<br><br>(A) Values of the Series<br>(B) Indices of the Series<br>(C) Data type of the Series<br>(D) Name of the Series                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| 21        | CBSE<br>Main<br>2024  | What will be the output of the following Python code?<br><br>import pandas as pd<br>dd = {'One': 1, 'Two': 2, 'Three': 3, 'Seven': 7}<br>rr = pd.Series(dd)<br>rr['Four'] = 4<br>print(rr)<br><br><table><tr><td>(i)</td><td>(ii)</td><td>(iii)</td><td>(iv)</td></tr><tr><td>One     1</td><td>One     1</td><td>Four    4</td><td>One     1</td></tr><tr><td>Two     2</td><td>Two     2</td><td>One     1</td><td>Two     2</td></tr><tr><td>Three   3</td><td>Three   3</td><td>Two     2</td><td>Three   3</td></tr><tr><td>Seven   7</td><td>Four    4</td><td>Three   3</td><td>Seven   7</td></tr><tr><td>Four    4</td><td>Seven   7</td><td>Seven   7</td><td>Four    4</td></tr></table> | (i)       | (ii) | (iii) | (iv) | One     1 | One     1 | Four    4 | One     1 | Two     2 | Two     2 | One     1 | Two     2 | Three   3 | Three   3 | Two     2 | Three   3 | Seven   7 | Four    4 | Three   3 | Seven   7 | Four    4 | Seven   7 | Seven   7 | Four    4 |
| (i)       | (ii)                  | (iii)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (iv)      |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| One     1 | One     1             | Four    4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | One     1 |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| Two     2 | Two     2             | One     1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Two     2 |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| Three   3 | Three   3             | Two     2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Three   3 |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| Seven   7 | Four    4             | Three   3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Seven   7 |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
| Four    4 | Seven   7             | Seven   7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Four    4 |      |       |      |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |

|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |              |              |
|----|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|
|    |                       | dtype: int64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | dtype: int64 | dtype: int64 | dtype: int64 |
| 22 | CBSE<br>Main<br>2024  | Which of the following command will not show the first five rows from the Pandas series named S1?<br><br>(i) S1[0:5]<br>(ii) S1.head()<br>(iii) S1.head(5)<br>(iv) S1.head[0:5]                                                                                                                                                                                                                                                                                                                                                                                               |              |              |              |
| 23 | CBSE<br>Compt<br>2024 | In Pandas library of Python, a one-dimensional array containing a sequence of values of any datatype is known as :<br><br>(A) DataFrame<br>(B) Histogram<br>(C) Series<br>(D) Panel                                                                                                                                                                                                                                                                                                                                                                                           |              |              |              |
| 24 | CBSE<br>Compt<br>2024 | What will be the output of the following Python code ?<br><br><pre>import pandas as pd dd = {'Jan':31,'Feb':28,'Mar':31,'Apr':30} rr = pd.Series(dd) print(rr)</pre> <div> <div>(A)</div> <div>Jan 31<br/>Feb 28<br/>Mar 31<br/>Apr 30<br/>dtype: int64</div> </div> <div> <div>(B)</div> <div>Jan Feb Mar<br/>31 28 31<br/>dtype: int64</div> </div> <div> <div>(C)</div> <div>Jan – 31<br/>Feb – 28<br/>Mar – 31<br/>Apr – 30<br/>dtype: int64</div> </div> <div> <div>(D)</div> <div>Jan<br/>Feb<br/>Mar<br/>Apr<br/>31<br/>28<br/>31<br/>30<br/>dtype: int64</div> </div> |              |              |              |
| 25 | CBSE<br>SQP<br>2024   | Which of the following command will show the last 3 rows from a Pandas Series named NP?<br><br>i. NP.Tail( )<br>ii. NP.tail(3)<br>iii. NP.TAIL(3)<br>iv. All of the above                                                                                                                                                                                                                                                                                                                                                                                                     |              |              |              |

|     |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |      |       |      |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 26  | CBSE<br>SQP<br>2024  | <p>In Python Pandas, while performing mathematical operations on series, index matching is implemented and all missing values are filled in with _____by default.</p> <p>i. Null<br/>ii. Blank<br/>iii. NaN<br/>iv. Zero</p>                                                                                                                                                                                                                                                                                    |      |      |       |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 27  | CBSE<br>SQP<br>2024  | <p>Assertion (A):- To use the Pandas library in a Python program, one must import it.<br/>Reasoning (R): - The only alias name that can be used with the Pandas library is pd.</p> <p>Choose correct option:<br/>i. Both A and R are true and R is the correct explanation for A<br/>ii. Both A and R are true and R is not the correct explanation for A<br/>iii. A is True but R is False<br/>iv. A is false but R is True</p>                                                                                |      |      |       |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 28  | CBSE<br>Main<br>2023 | <p>What will be the output of the following code?</p> <pre>import pandas as pd<br/>myser = pd.Series([0, 0, 0])<br/>print(myser)</pre> <table><tr><td>(i)</td><td>(ii)</td><td>(iii)</td><td>(iv)</td></tr><tr><td>0 0</td><td>0 1</td><td>0 0</td><td>0 0</td></tr><tr><td>0 0</td><td>0 1</td><td>1 0</td><td>1 1</td></tr><tr><td>0 0</td><td>0 2</td><td>2 0</td><td>2 2</td></tr></table>                                                                                                                  | (i)  | (ii) | (iii) | (iv) | 0 0 | 0 1 | 0 0 | 0 0 | 0 0 | 0 1 | 1 0 | 1 1 | 0 0 | 0 2 | 2 0 | 2 2 |
| (i) | (ii)                 | (iii)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | (iv) |      |       |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 0 0 | 0 1                  | 0 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 0  |      |       |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 0 0 | 0 1                  | 1 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1 1  |      |       |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 0 0 | 0 2                  | 2 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2 2  |      |       |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 29  | CBSE<br>Main<br>2023 | <p>Assertion (A) : The output of addition of two series will be NaN, if one of the elements or both the elements have no value(s).<br/>Reason (R) : While performing mathematical operations on a series, by default all missing values are filled in with 0.</p> <p>Choose correct option:<br/>i. Both A and R are true and R is the correct explanation for A<br/>ii. Both A and R are true and R is not the correct explanation for A<br/>iii. A is True but R is False<br/>iv. A is false but R is True</p> |      |      |       |      |     |     |     |     |     |     |     |     |     |     |     |     |
| 30  | CBSE                 | Which of the following is a one-dimensional array containing a sequence of                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |      |       |      |     |     |     |     |     |     |     |     |     |     |     |     |

|    |                           |                                                                                                                                                                         |
|----|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Compt<br>2023             | values in Python ?<br>(a) Relation<br>(b) DataFrame<br>(c) Series<br>(d) Square                                                                                         |
| 31 | CBSE<br>Compt<br>2023     | In Python Pandas, head(n) method returns the first n members of the series.<br>What is the default value of n ?<br>(a) 2<br>(b) 3<br>(c) 4<br>(d) 5                     |
| 32 | CBSE<br>SQP<br>2023       | To display last five rows of a series object 'S', you may write:<br>i. S.Head( )<br>ii. S.Tail(5)<br>iii. S.Head(5)<br>iv. S.tail( )                                    |
| 33 | CBSE<br>SQP<br>2023       | Which of the following statement will import pandas library?<br>i. Import pandas as pd<br>ii. import Pandas as py<br>iii. import pandas as pd<br>iv. import panda as pd |
| 34 | CBSE<br>SQP<br>2022<br>T1 | The name "Pandas" is derived from the term:<br>a. Panel Data<br>b. Panel Series<br>c. Python Document<br>d. Panel Data Frame                                            |
| 35 | CBSE<br>SQP<br>2022<br>T1 | The command to install the pandas is:<br>a. install pip pandas<br>b. install pandas<br>c. pip pandas                                                                    |

|    |                           |                                                                                                                                                                                                                           |
|----|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                           | d. pip install pandas                                                                                                                                                                                                     |
| 36 | CBSE<br>SQP<br>2022<br>T1 | Python pandas was developed by:<br><br>a. Guido van Rossum<br>b. Travis Oliphant<br>c. Wes McKinney<br>d. Brendan Eich                                                                                                    |
| 37 | CBSE<br>SQP<br>2022<br>T1 | Pandas Series is:<br><br>a. 2 Dimensional<br>b. 3 Dimensional<br>c. 1 Dimensional<br>d. Multidimensional                                                                                                                  |
| 38 | CBSE<br>SQP<br>2022<br>T1 | Pandas is a:<br><br>a. Package<br>b. Language<br>c. Library<br>d. Software                                                                                                                                                |
| 39 | CBSE<br>SQP<br>2022<br>T1 | What will be the output of the given code?<br><br>import pandas as pd<br>s = pd.Series([1,2,3,4,5],<br>index=['akram','brijesh','charu','deepika','era'])<br>print(s['charu'])<br><br>a. 1<br>b. 2<br>c. 3<br>d. 4        |
| 40 | CBSE<br>SQP<br>2022<br>T1 | Assuming the given series, named stud, which command will be used to print 5 as output?<br><br>Amit                90<br>Ramesh            100<br>Mahesh            50<br>john                67<br>Abdul              89 |

|    |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                           | <p>Name: Student, dtype: int64</p> <p>a. stud.index<br/>b. stud.length<br/>c. stud.values<br/>d. stud.size</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 41 | CBSE<br>SQP<br>2022<br>T1 | <p>A social science teacher wants to use a pandas series to teach about Indian historical monuments and its states. The series should have the monument names as values and state names as indexes which are stored in the given lists, as shown in the code. Choose the statement which will create the series:</p> <pre>import pandas as pd Monument=['Qutub Minar','Gateway of India','Red Fort','Taj Mahal'] State=['Delhi','Maharashtra','Delhi','Uttar Pradesh']</pre> <p>a. S=df.Series(Monument,index=State)<br/>b. S=pd.Series(State,Monument)<br/>c. S=pd.Series(Monument,index=State)<br/>d. S=pd.series(Monument,index=State)</p> |
| 42 | CBSE<br>SQP<br>2022<br>T1 | <p>Consider the following series named animal:</p> <pre>L      Lion B      Bear E      Elephant T      Tiger W      Wolf dtype: object</pre> <p>Write the output of the command:</p> <pre>print(animal[::-3])</pre> <p>a. L Lion<br/>T Tiger<br/>dtype: object</p> <p>b. B Bear<br/>E Elephant<br/>dtype: object</p> <p>c. W Wolf<br/>B Bear<br/>dtype: object</p> <p>d. W Wolf<br/>T Tiger<br/>dtype: object</p>                                                                                                                                                                                                                             |

### (1- Mark Questions - Answers)

|    |                                                                                           |
|----|-------------------------------------------------------------------------------------------|
| 1  | (C) The keys of the dictionary become the indices of the Series.                          |
| 2  | (B) The element at the end index is excluded from the output.                             |
| 3  | False                                                                                     |
| 4  | True                                                                                      |
| 5  | False                                                                                     |
| 6  | (D) All elements in reverse order                                                         |
| 7  | True                                                                                      |
| 8  | (D) Not a Number                                                                          |
| 9  | (a) Both A and R are true, and R is the correct explanation of A                          |
| 10 | (D) Consecutive integers starting from 0                                                  |
| 11 | (C) The result has all indices, with missing values filled as NaN                         |
| 12 | (C) Numeric                                                                               |
| 13 | (C) Series                                                                                |
| 14 | (C) ser[points]                                                                           |
| 15 | (B) numpy                                                                                 |
| 16 | False                                                                                     |
| 17 | (C) pd.Series(array1)                                                                     |
| 18 | (b) Both A and R are true, but R is not the correct explanation of                        |
| 19 | True                                                                                      |
| 20 | (B) Indices of the Series                                                                 |
| 21 | (i)<br>One      1<br>Two      2<br>Three    3<br>Seven    7<br>Four     4<br>dtype: int64 |

|    |                                                             |
|----|-------------------------------------------------------------|
| 22 | (iv) S1.head[0:5]                                           |
| 23 | (C) Series                                                  |
| 24 | (A)<br>Jan 31<br>Feb 28<br>Mar 31<br>Apr 30<br>dtype: int64 |
| 25 | (ii) NP.tail(3)                                             |
| 26 | (iii) NaN                                                   |
| 27 | (iii) A is True but R is False                              |
| 28 | (iii)<br>0 0<br>1 0<br>2 0<br>dtype: int64                  |
| 29 | (iii) A is True but R is False                              |
| 30 | (c) Series                                                  |
| 31 | (d) 5                                                       |
| 32 | (iv) S.tail( )                                              |
| 33 | (iii) import pandas as pd                                   |
| 34 | (a) Panel Data                                              |
| 35 | (d) pip install pandas                                      |
| 36 | (b) Wes McKinney                                            |
| 37 | (c) 1 Dimensional                                           |
| 38 | (c) Library                                                 |
| 39 | (c) 3                                                       |
| 40 | (d) stud.size                                               |
| 41 | (c) S = pd.Series(Monument,index=State)                     |

|    |                                                |
|----|------------------------------------------------|
| 42 | (c)<br>W    Wolf<br>B    Bear<br>dtype: object |
|----|------------------------------------------------|

**(2 - Mark Questions)**

|   |                       |                                                                                                                                                                                                                                                                                                                                                         |
|---|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | CBSE<br>Main<br>2026  | Write the output of the following code :<br><br>import pandas as pd<br>s1 = pd.Series ([1, 2, 3], index = ['a','b','c'])<br>s2 = pd.Series ([4, 5, 6], index = ['b','c','d'])<br>print(s1 + S2)                                                                                                                                                         |
| 2 | CBSE<br>Main<br>2026  | List any two characteristics of Pandas library in Python.                                                                                                                                                                                                                                                                                               |
| 3 | CBSE<br>Main<br>2026  | Niharika wants to create a Pandas Series using a NumPy array with three elements 'a','b', and 'c', and assign custom indexes 'first','second' and 'third'.<br>Help her complete the code below.<br><br>import pandas as pd<br>import _____ as np<br>arr = np._____(['a' , 'b' , 'c'])<br>s = pd._____(arr,_____=['first','second','third'])<br>print(s) |
| 4 | CBSE<br>Compt<br>2026 | Write the output of the following code :<br><br>import pandas as pd<br>s1 = pd.Series([1, 2, 3], index=['a', 'b', 'c'])<br>s2 = pd.Series([4, 5, 6], index=['b', 'c', 'd'])<br>print(s1 * s2)                                                                                                                                                           |
| 5 | CBSE<br>SQP<br>2026   | Ravi wants to create a Pandas Series as shown below:<br><br>January                31<br>February             28<br>March                 31<br><br>Help him in completing the code below to achieve the desired output.<br>Note: ser_data is a dictionary.                                                                                             |

|    |                 |                                                                                                                                                                                                                                                                                                                                                             |
|----|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                 | <pre>import _____ as pd ser_data = _____ s = pd._____(ser_data) print(s)</pre>                                                                                                                                                                                                                                                                              |
| 6  | CBSE Main 2025  | Explain how we can access elements of a series using slicing. Give an example to support your answer.                                                                                                                                                                                                                                                       |
| 7  | CBSE Main 2025  | <p>Rohit is trying to create a Pandas Series from scalar values. His code has some mistakes. Rewrite the correct code and underline the corrections made.</p> <pre>import pandas data = [50, 15, 40] series = pd.series(data, Index=['x', 'y', 'z']) Print (series)</pre>                                                                                   |
| 8  | CBSE Compt 2025 | <p>Complete the given Python code to get the required output as (ignore the dtype attribute) :</p> <p><u>Output :</u></p> <pre>Dog      Mammal Cat      Mammal Goldfish Fish</pre> <p><u>Code :</u></p> <pre>import _____ as pd data = ['Mammal', 'Mammal', 'Fish'] indx = ['Dog', '_____', 'Goldfish'] s = pd.Series(_____, index=indx) print(_____)</pre> |
| 9  | CBSE SQP 2025   | What is a Series in Python Pandas? Also, give a suitable example to support your answer.                                                                                                                                                                                                                                                                    |
| 10 | CBSE SQP 2025   | What does the term 'library' signify in Python? Mention one use for each of the following libraries: "pandas" and "matplotlib"                                                                                                                                                                                                                              |
| 11 | CBSE SQP        | Complete the given Python code to get the required output (ignore the dtype attribute) as Output:                                                                                                                                                                                                                                                           |

|       | 2025                  | <div> <div>Tamil Nadu</div> <div>Uttar Pradesh</div> <div>Manipur</div> </div> <div> <div>Chennai</div> <div>Lucknow</div> <div>Imphal</div> </div> <p><u>Code:</u></p> <pre>import _____ as pd data = ['Chennai','_____', 'Imphal'] indx = ['Tamil Nadu','Uttar Pradesh','Manipur'] s = pd.Series(_____, indx) print(_____)</pre>                                                                                                                                                                                       |  |              |               |       |              |     |       |         |     |       |           |     |       |        |     |
|-------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------|---------------|-------|--------------|-----|-------|---------|-----|-------|-----------|-----|-------|--------|-----|
| 12    | CBSE<br>Main<br>2024  | <p>The Python code written below has syntactical errors.<br/>Rewrite the correct code and underline the correction(s) made.</p> <pre>import Pandas as pd stud = ['Name':'Ramya','Class':11,'House':'Red'] s = P.Series(s) print(s)</pre>                                                                                                                                                                                                                                                                                 |  |              |               |       |              |     |       |         |     |       |           |     |       |        |     |
| 13    | CBSE<br>Main<br>2024  | <p>Find the output of the following Python code:</p> <pre>import pandas as pd com=pd.Series([45,12,15,200],index=['mouse','printer','webcam','keyb<br/>oard']) print(com[1:3])</pre>                                                                                                                                                                                                                                                                                                                                     |  |              |               |       |              |     |       |         |     |       |           |     |       |        |     |
| 14    | CBSE<br>Compt<br>2024 | <p>Find the output of the following Python code :</p> <pre>import pandas as pd vaccine_qty=pd.Series([10,16,1],index=["Typhoid",<br/>"Tetanus","Hepatitis"]) cost=pd.Series([200,500,800],index=["Typhoid","Tetanus", "Flu"]) print(vaccine_qty + cost)</pre>                                                                                                                                                                                                                                                            |  |              |               |       |              |     |       |         |     |       |           |     |       |        |     |
| 15    | CBSE<br>SQP<br>2024   | <p>Create two series — one to store various product names and the other to store the corresponding price. Each series should have appropriate row label as given below :</p> <table> <thead> <tr> <th></th><th>Product_name</th><th>Product price</th></tr> </thead> <tbody> <tr> <td>B1001</td><td>Butterscotch</td><td>130</td></tr> <tr> <td>V3002</td><td>Vanilla</td><td>100</td></tr> <tr> <td>M4002</td><td>Mango Zap</td><td>150</td></tr> <tr> <td>M4007</td><td>Magnum</td><td>190</td></tr> </tbody> </table> |  | Product_name | Product price | B1001 | Butterscotch | 130 | V3002 | Vanilla | 100 | M4002 | Mango Zap | 150 | M4007 | Magnum | 190 |
|       | Product_name          | Product price                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |              |               |       |              |     |       |         |     |       |           |     |       |        |     |
| B1001 | Butterscotch          | 130                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |              |               |       |              |     |       |         |     |       |           |     |       |        |     |
| V3002 | Vanilla               | 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |              |               |       |              |     |       |         |     |       |           |     |       |        |     |
| M4002 | Mango Zap             | 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |              |               |       |              |     |       |         |     |       |           |     |       |        |     |
| M4007 | Magnum                | 190                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |              |               |       |              |     |       |         |     |       |           |     |       |        |     |

|    |                       |                                                                                                                                                                                                                                                                                                                 |          |     |
|----|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|
|    |                       | C6005                                                                                                                                                                                                                                                                                                           | Cassatta | 200 |
| 16 | CBSE<br>SQP<br>2024   | Predict the output of the given Python code:<br><br><pre>import pandas as pd list1=[-10,-20,-30] ser = pd.Series(list1*2) print(ser)</pre>                                                                                                                                                                      |          |     |
| 17 | CBSE<br>SQP<br>2024   | Complete the given Python code to get the required output as: Rajasthan<br><br><pre>import _____ as pd di = {'Corbett': 'Uttarakhand', 'Sariska': 'Rajasthan', 'Kanha': 'Madhya Pradesh',       'Gir': 'Gujarat'} NP = _____. Series( _____ ) print(NP[ _____ ])</pre>                                          |          |     |
| 18 | CBSE<br>Main<br>2023  | Write a Python program to create a series object, country using a list that stores the capital of each country.<br>Note : Assume four countries to be used as index of the series object are India, UK, Denmark, and Thailand having their capitals as New Delhi, London, Copenhagen, and Bangkok respectively. |          |     |
| 19 | CBSE<br>Main<br>2023  | What will be the output of the following code :<br><br><pre>import pandas as pd sl=pd. Series (data=2* (3,10) ) print (s1)</pre>                                                                                                                                                                                |          |     |
| 20 | CBSE<br>Compt<br>2023 | What will be the output of the following code ?<br><br><pre>import pandas as pd S1=pd.Series(data=[1,7]) S2=pd.Series(S1+S1) print(S2)</pre>                                                                                                                                                                    |          |     |
| 21 | CBSE<br>SQP<br>2023   | Write a program to create a series object using a dictionary that stores the number of students in each house of class 12D of your school.<br>Note: Assume four house names are Beas, Chenab, Ravi and Satluj having 18, 2, 20, 18 students respectively and pandas library has been imported as pd.            |          |     |
| 22 | CBSE<br>SQP           | What will be the output of the following code:                                                                                                                                                                                                                                                                  |          |     |

|    |                        |                                                                                                                                                                                                                    |
|----|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | 2023                   | <pre>import pandas as pd A = pd.Series(data=[35,45,55,40]) print(A&gt;45)</pre>                                                                                                                                    |
| 23 | CBSE<br>SQP<br>2022 T1 | <p>Write the output of the given program:</p> <pre>import pandas as pd S1 = pd.Series([5,6,7,8,10], index=['v','w','x','y','z']) l = [2,6,1,4,6] S2 = pd.Series(l, index=['z','y','a','w','v']) print(S1-S2)</pre> |
| 24 | CBSE<br>SQP<br>2022 T1 | <p>Write the output of the given command:</p> <pre>import pandas as pd s = pd.Series([1,2,3,4,5,6],index=['A','B','C','D','E','F']) print(s[s%2==0])</pre>                                                         |

### (2 - Mark Questions - Answers)

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <p>Output:</p> <p>a NaN</p> <p>b 6.0</p> <p>c 8.0</p> <p>d NaN</p> <p>dtype: float64</p>                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2 | <ol style="list-style-type: none"> <li>1. It provides fast, flexible, and expressive data structures (Series and DataFrame) that make working with structured/labelled data easy.</li> <li>2. It handles missing data (NaN) gracefully and automatically aligns data by index during operations.</li> <li>3. It offers powerful tools for reading/writing data from many formats (CSV, Excel, SQL, JSON, etc.) and for merging, reshaping, and analysing data.</li> <li>4. It is open-source and built on top of NumPy.</li> </ol> |
| 3 | <pre>import pandas as pd import numpy as np arr = np.array(['a', 'b', 'c']) s = pd.Series(arr, index=['first', 'second', 'third']) print(s)</pre>                                                                                                                                                                                                                                                                                                                                                                                  |
| 4 | Output:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <pre> a    NaN b    10.0 c    18.0 d    NaN dtype: float64 </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5 | <pre> import pandas as pd ser_data = {'January': 31, 'February': 28, 'March': 31} s = pd.Series(ser_data) print(s) </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 6 | <p>Slicing lets you extract a range/subset of elements from a Series, similar to slicing a list.</p> <ul style="list-style-type: none"> <li>• Positional slicing — <code>series[start:end]</code> — uses integer positions; the end position is excluded (like normal Python slicing).</li> <li>• Label-based slicing — <code>series['label1':'label2']</code> — uses index labels; here both the start and end labels are included in the result.</li> </ul> <p>Example:</p> <pre> import pandas as pd s = pd.Series([10, 20, 30, 40, 50], index=['a','b','c','d','e']) print(s[1:4])                # positional slicing -&gt; b, c, d                              (end excluded) print(s['b':'d'])            # label-based slicing -&gt; b, c, d                              (end included) </pre> |
| 7 | <p>Corrected code (corrections underlined):</p> <pre> import pandas <u>as pd</u>                # underline: 'as pd' added data = [50, 15, 40] series = pd.<u>S</u>eries(data, <u>i</u>ndex=['x', 'y', 'z'])  # underline: 'Series' (S), 'index' (i) <u>p</u>rint(series)                        # underline: 'print' (lower- case p) </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 8 | <pre> import pandas as pd data = ['Mammal', 'Mammal', 'Fish'] indx = ['Dog', 'Cat', 'Goldfish'] s = pd.Series(data, index=indx) print(s) </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 9 | <p>A Series is a one-dimensional, labelled, array-like object in Pandas that can hold data of any single type (integers, floats, strings, objects, etc.). Each value has an associated label, called the index, which by default is 0,1,2,... but can be customised.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p>Example:</p> <pre>import pandas as pd s = pd.Series([10, 20, 30], index=['a', 'b', 'c']) print(s)</pre> <p>Output:</p> <pre>a    10 b    20 c    30 dtype: int64</pre>                                                                                                                                                                                                                                                                                      |
| 10 | <p>A library is a collection of pre-written, reusable code (functions, classes, and modules) that a programmer can import and use directly, instead of writing that functionality from scratch.</p> <ul style="list-style-type: none"> <li>• pandas: used for data manipulation and analysis — handling structured/tabular data with Series and DataFrame.</li> <li>• matplotlib: used for data visualization — creating graphs, charts, and plots.</li> </ul> |
| 11 | <pre>import pandas as pd data = ['Chennai', 'Lucknow', 'Imphal'] indx = ['Tamil Nadu', 'Uttar Pradesh', 'Manipur'] s = pd.Series(data, indx) print(s)</pre>                                                                                                                                                                                                                                                                                                    |
| 12 | <pre>import <u>p</u>andas as pd                                # underline: 'pandas' (lower-case p) stud = <u>{</u>'Name': 'Ramya', 'Class': 11, 'House': 'Red'<u>}</u>  # underline: curly braces { } instead of [ ] s = pd.<u>S</u>eries(<u>stud</u>)                                # underline: 'pd', argument 'stud' print(s)</pre>                                                                                                                       |
| 13 | <p>Output:</p> <pre>printer      12 webcam      15 dtype: int64</pre>                                                                                                                                                                                                                                                                                                                                                                                          |
| 14 | <pre>Flu          NaN Hepatitis    NaN Tetanus      516.0 Typhoid      210.0 dtype: float64</pre>                                                                                                                                                                                                                                                                                                                                                              |

|    |                                                                                                                                                                                                                                                                                                          |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15 | <pre>import pandas as pd labels = ['B1001', 'V3002', 'M4002', 'M4007', 'C6005'] Product_name = pd.Series(['Butterscotch', 'Vanilla', 'Mango Zap', 'Magnum', 'Cassatta'], index=labels) Product_price = pd.Series([130, 100, 150, 190, 200], index=labels) print(Product_name) print(Product_price)</pre> |
| 16 | <pre>Output: 0  -10 1  -20 2  -30 3  -10 4  -20 5  -30 dtype: int64</pre>                                                                                                                                                                                                                                |
| 17 | <pre>import pandas as pd di = {'Corbett':'Uttarakhand','Sariska':'Rajasthan','Kanha':'Madhya Pradesh','Gir':'Gujarat'} NP = pd.Series(di) print(NP['Sariska'])</pre>                                                                                                                                     |
| 18 | <pre>import pandas as pd country = pd.Series(['New Delhi', 'London', 'Copenhagen', 'Bangkok'], index=['India', 'UK', 'Denmark', 'Thailand']) print(country)</pre>                                                                                                                                        |
| 19 | <pre>Output: 0    3 1   10 2    3 3   10 dtype: int64</pre>                                                                                                                                                                                                                                              |
| 20 | <pre>Output: 0    2 1   14 dtype: int64</pre>                                                                                                                                                                                                                                                            |
| 21 | <pre>import pandas as pd data = {'Beas': 18, 'Chenab': 2, 'Ravi': 20, 'Satluj': 18} s = pd.Series(data) print(s)</pre>                                                                                                                                                                                   |

|    |                                                                                  |
|----|----------------------------------------------------------------------------------|
| 22 | Output:<br>0 False<br>1 False<br>2 True<br>3 False<br>dtype: bool                |
| 23 | Output:<br>a NaN<br>v -1.0<br>w 2.0<br>x NaN<br>y 2.0<br>z 8.0<br>dtype: float64 |
| 24 | Output:<br>B 2<br>D 4<br>F 6<br>dtype: int64                                     |

**(3 - Mark Questions)**

|             |                       |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
|-------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----|---------|----|-----------|----|---------|----|
| 1           | CBSE<br>Main<br>2026  | <p>Write a Python program to create and display a Pandas Series as shown below :</p> <table><tr><td>July</td><td>31</td></tr><tr><td>Aug</td><td>31</td></tr><tr><td>Sept</td><td>30</td></tr><tr><td>Oct</td><td>31</td></tr></table> <p>The index labels are the names of the months – July, Aug, Sept, Oct.<br/>The corresponding scalar values are the number of days in these respective months – 31, 31, 30, 31.</p> | July        | 31 | Aug     | 31 | Sept      | 30 | Oct     | 31 |
| July        | 31                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| Aug         | 31                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| Sept        | 30                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| Oct         | 31                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| 2           | CBSE<br>Compt<br>2026 | <p>Write a Python program to create a NumPy array containing the names of five fruits. Convert it into a Pandas Series with custom indices ['A', 'B', 'C', 'D', 'E'].</p>                                                                                                                                                                                                                                                  |             |    |         |    |           |    |         |    |
| 3           | CBSE<br>Compt<br>2026 | <p>Write a Python program that creates a Pandas Series from a dictionary, where the subjects 'Physics', 'Maths', and 'Chemistry' are keys, and their respective marks 85, 90, and 65 are values.</p> <p>The program should also display the Series.</p> <table><tr><td>Physics</td><td>85</td></tr><tr><td>Maths</td><td>90</td></tr><tr><td>Chemistry</td><td>65</td></tr></table>                                        | Physics     | 85 | Maths   | 90 | Chemistry | 65 |         |    |
| Physics     | 85                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| Maths       | 90                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| Chemistry   | 65                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| 4           | CBSE<br>SQP<br>2026   | <p>Write a Python program to create a Pandas Series as shown below using a ndarray, where the subject names are the indices and the corresponding marks are the values in the series.</p> <table><tr><td>Mathematics</td><td>85</td></tr><tr><td>Science</td><td>90</td></tr><tr><td>English</td><td>78</td></tr><tr><td>History</td><td>88</td></tr></table>                                                              | Mathematics | 85 | Science | 90 | English   | 78 | History | 88 |
| Mathematics | 85                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| Science     | 90                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| English     | 78                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| History     | 88                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| 5           | CBSE<br>Main<br>2025  | <p>Write a Python program to create a Pandas Series as shown below from an ndarray containing the numbers 10, 20, 30, 40, 50 with corresponding indices 'A', 'B', 'C', 'D', 'E'.</p> <table><tr><td>A</td><td>10</td></tr><tr><td>B</td><td>20</td></tr><tr><td>C</td><td>30</td></tr><tr><td>D</td><td>40</td></tr></table>                                                                                               | A           | 10 | B       | 20 | C         | 30 | D       | 40 |
| A           | 10                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| B           | 20                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| C           | 30                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |
| D           | 40                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |             |    |         |    |           |    |         |    |

|   |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                 | E 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 6 | CBSE Compt 2025 | Write a Python program to create a Pandas Series from a scalar value. The Series should have indexes as 'X1','X2','X3','X4','X5' with each value in the Series set to 100.                                                                                                                                                                                                                                                                                                                                       |
| 7 | CBSE SQP 2025   | Write a Python Program to create a Pandas Series as shown below using a dictionary. Note that the left column indicates the indices and the right column displays the data.<br><br><div style="display: flex; justify-content: space-between;"> <div>Russia</div> <div>Moscow</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Hungary</div> <div>Budapest</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Switzerland</div> <div>Bern</div> </div> |
| 8 | CBSE Compt 2023 | Write a program in Python Pandas to create a series "car" from the following Dictionary :<br><br>dic={ "Model": ["Samurai","Accord","CR-V","Nexon"],<br>"Brand": ["Suzuki", "Honda", "Honda", "Tata"],<br>"Make": [1993,1997,1997,2021] }                                                                                                                                                                                                                                                                        |

### (3 - Mark Questions - Answers)

|           |                                                                                                                                                                                                                                                                                         |         |    |       |    |           |    |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|-------|----|-----------|----|
| 1         | <pre>import pandas as pd months = ['July', 'Aug', 'Sept', 'Oct'] days = [31, 31, 30, 31] s = pd.Series(days, index=months) print(s)</pre>                                                                                                                                               |         |    |       |    |           |    |
| 2         | <pre>import pandas as pd import numpy as np arr = np.array(['Apple', 'Banana', 'Cherry', 'Mango', 'Grapes']) s = pd.Series(arr, index=['A', 'B', 'C', 'D', 'E']) print(s)</pre>                                                                                                         |         |    |       |    |           |    |
| 3         | <pre>import pandas as pd data = {'Physics': 85, 'Maths': 90, 'Chemistry': 65} s = pd.Series(data) print(s)</pre> <p>Output:</p> <table style="width: 100%;"> <tr> <td>Physics</td><td>85</td></tr> <tr> <td>Maths</td><td>90</td></tr> <tr> <td>Chemistry</td><td>65</td></tr> </table> | Physics | 85 | Maths | 90 | Chemistry | 65 |
| Physics   | 85                                                                                                                                                                                                                                                                                      |         |    |       |    |           |    |
| Maths     | 90                                                                                                                                                                                                                                                                                      |         |    |       |    |           |    |
| Chemistry | 65                                                                                                                                                                                                                                                                                      |         |    |       |    |           |    |

|   |                                                                                                                                                                                                                                                                                                                                                                               |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | dtype: int64                                                                                                                                                                                                                                                                                                                                                                  |
| 4 | <pre>import pandas as pd import numpy as np marks = np.array([85, 90, 78, 88]) subjects = ['Mathematics', 'Science', 'English', 'History'] s = pd.Series(marks, index=subjects) print(s)</pre>                                                                                                                                                                                |
| 5 | <pre>import pandas as pd import numpy as np arr = np.array([10, 20, 30, 40, 50]) s = pd.Series(arr, index=['A', 'B', 'C', 'D', 'E']) print(s)</pre>                                                                                                                                                                                                                           |
| 6 | <pre>import pandas as pd s = pd.Series(100, index=['X1', 'X2', 'X3', 'X4', 'X5']) print(s)</pre>                                                                                                                                                                                                                                                                              |
| 7 | <pre>import pandas as pd data = {'Russia': 'Moscow', 'Hungary': 'Budapest', 'Switzerland': 'Bern'} s = pd.Series(data) print(s)</pre>                                                                                                                                                                                                                                         |
| 8 | <pre>import pandas as pd dic = {"Model": ["Samurai", "Accord", "CR-V", "Nexon"],       "Brand": ["Suzuki", "Honda", "Honda", "Tata"],       "Make": [1993, 1997, 1997, 2021]} car = pd.Series(dic) print(car)</pre> <p>Output:</p> <pre>Model    [Samurai, Accord, CR-V, Nexon] Brand     [Suzuki, Honda, Honda, Tata] Make      [1993, 1997, 1997, 2021] dtype: object</pre> |

### **Question Type: Short Type Questions-2**

| <b>Q.N.</b> | <b>Questions</b>                                                                                                                                                                                                                                                                                                                                                                                | <b>Marks</b> |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------|-------|---|------------|-----|---|------------|-----|---|----------------------|-----|---|--------------|-----|---|
| 1           | Write a Python code to create a DataFrame stock with appropriate column headings from the list given below:<br>[[101,'Gurman',98], [102,'Rajveer',95], [103,'Samar' ,96], [104,'Yuvraj',88]]                                                                                                                                                                                                    | 2            |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 2           | Write a Python code to create a DataFrame 'Stock' by using list:<br><table><thead><tr><th></th><th>Name</th><th>Price</th></tr></thead><tbody><tr><td>0</td><td>Nancy Drew</td><td>150</td></tr><tr><td>1</td><td>Hardy boys</td><td>180</td></tr><tr><td>2</td><td>Diary of a wimpy kid</td><td>225</td></tr><tr><td>3</td><td>Harry Potter</td><td>500</td></tr></tbody></table>              |              | Name | Price | 0 | Nancy Drew | 150 | 1 | Hardy boys | 180 | 2 | Diary of a wimpy kid | 225 | 3 | Harry Potter | 500 | 2 |
|             | Name                                                                                                                                                                                                                                                                                                                                                                                            | Price        |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 0           | Nancy Drew                                                                                                                                                                                                                                                                                                                                                                                      | 150          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 1           | Hardy boys                                                                                                                                                                                                                                                                                                                                                                                      | 180          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 2           | Diary of a wimpy kid                                                                                                                                                                                                                                                                                                                                                                            | 225          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 3           | Harry Potter                                                                                                                                                                                                                                                                                                                                                                                    | 500          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 3           | Write a Python code to create a DataFrame 'Stock' by using dictionary method:<br><table><thead><tr><th></th><th>Name</th><th>Price</th></tr></thead><tbody><tr><td>0</td><td>Nancy Drew</td><td>150</td></tr><tr><td>1</td><td>Hardy boys</td><td>180</td></tr><tr><td>2</td><td>Diary of a wimpy kid</td><td>225</td></tr><tr><td>3</td><td>Harry Potter</td><td>500</td></tr></tbody></table> |              | Name | Price | 0 | Nancy Drew | 150 | 1 | Hardy boys | 180 | 2 | Diary of a wimpy kid | 225 | 3 | Harry Potter | 500 | 2 |
|             | Name                                                                                                                                                                                                                                                                                                                                                                                            | Price        |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 0           | Nancy Drew                                                                                                                                                                                                                                                                                                                                                                                      | 150          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 1           | Hardy boys                                                                                                                                                                                                                                                                                                                                                                                      | 180          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 2           | Diary of a wimpy kid                                                                                                                                                                                                                                                                                                                                                                            | 225          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 3           | Harry Potter                                                                                                                                                                                                                                                                                                                                                                                    | 500          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 4           | Write a Python code to create a DataFrame 'Stock' by using Series method:<br><table><thead><tr><th></th><th>Name</th><th>Price</th></tr></thead><tbody><tr><td>0</td><td>Nancy Drew</td><td>150</td></tr><tr><td>1</td><td>Hardy boys</td><td>180</td></tr><tr><td>2</td><td>Diary of a wimpy kid</td><td>225</td></tr><tr><td>3</td><td>Harry Potter</td><td>500</td></tr></tbody></table>     |              | Name | Price | 0 | Nancy Drew | 150 | 1 | Hardy boys | 180 | 2 | Diary of a wimpy kid | 225 | 3 | Harry Potter | 500 | 2 |
|             | Name                                                                                                                                                                                                                                                                                                                                                                                            | Price        |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 0           | Nancy Drew                                                                                                                                                                                                                                                                                                                                                                                      | 150          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 1           | Hardy boys                                                                                                                                                                                                                                                                                                                                                                                      | 180          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 2           | Diary of a wimpy kid                                                                                                                                                                                                                                                                                                                                                                            | 225          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 3           | Harry Potter                                                                                                                                                                                                                                                                                                                                                                                    | 500          |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |
| 5           | Find output of following code import pandas as pd<br>Year1={'Q1':[5000,10],'Q2':[8000,20],'Q3':[12000,30],'Q4':[18000,4 0]}<br>df=pd.DataFrame(Year1)<br>print(df)                                                                                                                                                                                                                              | 2            |      |       |   |            |     |   |            |     |   |                      |     |   |              |     |   |

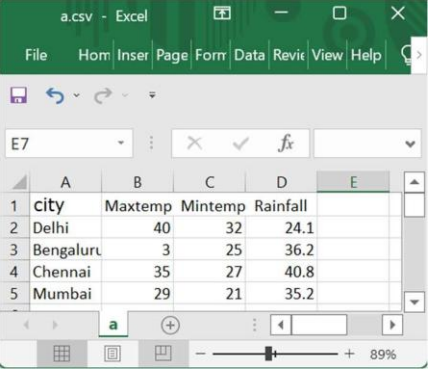
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |         |         |          |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|----------|---------|----------|---|-------|----|----|------|---|-----------|----|----|------|---|---------|----|----|------|---|--------|----|----|------|---|
| 6  | Find output of following code<br>import pandas as pd<br>Year1={'Q1':[5000,10],'Q2':[8000,20],'Q3':[12000,30],'Q4':[18000,40]}<br>totSales={1:Year1}<br>df=pd.DataFrame(totSales)<br>print(df)                                                                                                                                                                                                                                                                                                       | 2       |         |          |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 7  | Write a Python code to create a DataFrame with appropriate column headings from the csv file given below:<br><table><tr><td></td><td>city</td><td>Maxtemp</td><td>Mintemp</td><td>Rainfall</td></tr><tr><td>0</td><td>Delhi</td><td>40</td><td>32</td><td>24.1</td></tr><tr><td>1</td><td>Bengaluru</td><td>31</td><td>25</td><td>36.2</td></tr><tr><td>2</td><td>Chennai</td><td>35</td><td>27</td><td>40.8</td></tr><tr><td>3</td><td>Mumbai</td><td>29</td><td>21</td><td>35.2</td></tr></table> |         | city    | Maxtemp  | Mintemp | Rainfall | 0 | Delhi | 40 | 32 | 24.1 | 1 | Bengaluru | 31 | 25 | 36.2 | 2 | Chennai | 35 | 27 | 40.8 | 3 | Mumbai | 29 | 21 | 35.2 | 3 |
|    | city                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Maxtemp | Mintemp | Rainfall |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 0  | Delhi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 40      | 32      | 24.1     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 1  | Bengaluru                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 31      | 25      | 36.2     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 2  | Chennai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 35      | 27      | 40.8     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 3  | Mumbai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 29      | 21      | 35.2     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 8  | Write a Python code to create a DataFrame 'temp' by using list:<br><table><tr><td></td><td>city</td><td>Maxtemp</td><td>Mintemp</td><td>Rainfall</td></tr><tr><td>0</td><td>Delhi</td><td>40</td><td>32</td><td>24.1</td></tr><tr><td>1</td><td>Bengaluru</td><td>31</td><td>25</td><td>36.2</td></tr><tr><td>2</td><td>Chennai</td><td>35</td><td>27</td><td>40.8</td></tr><tr><td>3</td><td>Mumbai</td><td>29</td><td>21</td><td>35.2</td></tr></table>                                           |         | city    | Maxtemp  | Mintemp | Rainfall | 0 | Delhi | 40 | 32 | 24.1 | 1 | Bengaluru | 31 | 25 | 36.2 | 2 | Chennai | 35 | 27 | 40.8 | 3 | Mumbai | 29 | 21 | 35.2 | 3 |
|    | city                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Maxtemp | Mintemp | Rainfall |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 0  | Delhi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 40      | 32      | 24.1     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 1  | Bengaluru                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 31      | 25      | 36.2     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 2  | Chennai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 35      | 27      | 40.8     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 3  | Mumbai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 29      | 21      | 35.2     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 9  | Write a Python code to create a DataFrame 'temp' by using dictionary method:<br><table><tr><td></td><td>city</td><td>Maxtemp</td><td>Mintemp</td><td>Rainfall</td></tr><tr><td>0</td><td>Delhi</td><td>40</td><td>32</td><td>24.1</td></tr><tr><td>1</td><td>Bengaluru</td><td>31</td><td>25</td><td>36.2</td></tr><tr><td>2</td><td>Chennai</td><td>35</td><td>27</td><td>40.8</td></tr><tr><td>3</td><td>Mumbai</td><td>29</td><td>21</td><td>35.2</td></tr></table>                              |         | city    | Maxtemp  | Mintemp | Rainfall | 0 | Delhi | 40 | 32 | 24.1 | 1 | Bengaluru | 31 | 25 | 36.2 | 2 | Chennai | 35 | 27 | 40.8 | 3 | Mumbai | 29 | 21 | 35.2 | 3 |
|    | city                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Maxtemp | Mintemp | Rainfall |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 0  | Delhi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 40      | 32      | 24.1     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 1  | Bengaluru                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 31      | 25      | 36.2     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 2  | Chennai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 35      | 27      | 40.8     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 3  | Mumbai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 29      | 21      | 35.2     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 10 | Write a Python code to create a DataFrame 'temp' by using Series method:<br><table><tr><td></td><td>city</td><td>Maxtemp</td><td>Mintemp</td><td>Rainfall</td></tr><tr><td>0</td><td>Delhi</td><td>40</td><td>32</td><td>24.1</td></tr><tr><td>1</td><td>Bengaluru</td><td>31</td><td>25</td><td>36.2</td></tr><tr><td>2</td><td>Chennai</td><td>35</td><td>27</td><td>40.8</td></tr><tr><td>3</td><td>Mumbai</td><td>29</td><td>21</td><td>35.2</td></tr></table>                                  |         | city    | Maxtemp  | Mintemp | Rainfall | 0 | Delhi | 40 | 32 | 24.1 | 1 | Bengaluru | 31 | 25 | 36.2 | 2 | Chennai | 35 | 27 | 40.8 | 3 | Mumbai | 29 | 21 | 35.2 | 3 |
|    | city                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Maxtemp | Mintemp | Rainfall |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 0  | Delhi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 40      | 32      | 24.1     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 1  | Bengaluru                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 31      | 25      | 36.2     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 2  | Chennai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 35      | 27      | 40.8     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 3  | Mumbai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 29      | 21      | 35.2     |         |          |   |       |    |    |      |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |

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**Answers:**

| QN | Answers                                                                                                                                                                                                     | Marks |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1  | <pre>import pandas as pd d=[[101,'Gurman',98],[102,'Rajveer',95],[103,'Samar',96],[104,'Yuvraj',88]] c=['sno','Name','Score'] stock=pd.DataFrame(d,columns=c) print(stock)</pre>                            | 2     |
| 2  | <pre>d=[['Nancy Drew',150],['Hardy boys',180],['Diary of a wimpy kid',225],['Harry Potter',500]] c=['Name','Price'] stock=pd.DataFrame(d,columns=c) print(stock)</pre>                                      | 2     |
| 3  | <pre>import pandas as pd d={'Name':['Nancy Drew','Hardy boys','Diary of a wimpy kid','Harry Potter'] Price:[150,180,225,500]} stock =pd.DataFrame(d) print(stock)</pre>                                     | 2     |
| 4  | <pre>import pandas as pd s1=pd.Series(['Nancy Drew','Hardy boys','Diary of a wimpy kid','Harry Potter']) s2=pd.Series([150,180,225,500]) d ={'Name':s1,'Price':s2} stock=pd.DataFrame(d) print(stock)</pre> | 2     |
| 5  | <pre>Q1    Q2    Q3    Q4 0    5000  8000 12000 18000 1     10    20   30    40</pre>                                                                                                                       | 2     |
| 6  | <pre>0      1 Q1  [5000, 10] Q2  [8000, 20] Q3  [12000, 30]</pre>                                                                                                                                           | 2     |

|    |                                                                                                                                                                                                                                                                   |   |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 7  |  <pre> import pandas as pd df=pd.read_csv(r"C:\Users\rasha\OneDrive\Desktop\a.csv") print(df) </pre>                                                                             | 3 |
| 8  | <pre> import pandas as pd  d=[['Delhi',40,32,24.1],['Bengaluru',31,25,36.2],['Chennai',35,27,40.8], ,['Mumbai',29,21,35.2]]  c=['city','Maxtemp','Mintemp','Rainfall']  temp=pd.DataFrame(d,columns=c)  print(temp) </pre>                                        | 3 |
| 9  | <pre> import pandas as pd  d={'city':['Delhi','Bengaluru','Chennai','Mumbai'], 'Maxtemp':[40,31,35,29],     'Mintemp':[32,25,27,21], 'Rainfall':[24.1,36.2,40.8,35.2]}  temp=pd.DataFrame(d) Stock =pd.DataFrame(d)  print(temp) </pre>                           | 3 |
| 10 | <pre> import pandas as pd  s1=pd.Series(['Delhi','Bengaluru','Chennai','Mumbai']) s2=pd.Series([40,31,35,29]) s3=pd.Series([32,25,27,21]) s4=pd.Series([24.1,36.2,40.8,35.2])  d={'city':s1,'Maxtemp':s2,'Mintemp':s3,'Rainfall':s4}  temp=pd.DataFrame(d) </pre> | 3 |

|  |             |  |
|--|-------------|--|
|  | print(temp) |  |
|--|-------------|--|

### **Question Type: Long Type Questions-1**

| Q.N. | Questions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Marks       |       |       |       |     |   |     |          |     |     |   |     |           |     |     |   |     |             |     |    |   |     |           |     |    |   |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------|-------|-------|-----|---|-----|----------|-----|-----|---|-----|-----------|-----|-----|---|-----|-------------|-----|----|---|-----|-----------|-----|----|---|
| 1    | <p>Consider the given DataFrame:</p> <table><thead><tr><th></th><th>Pcd</th><th>title</th><th>Price</th><th>qty</th></tr></thead><tbody><tr><td>0</td><td>P01</td><td>Notebook</td><td>85</td><td>500</td></tr><tr><td>1</td><td>P02</td><td>Pencilbox</td><td>76</td><td>200</td></tr><tr><td>2</td><td>P03</td><td>WaterBottle</td><td>129</td><td>50</td></tr><tr><td>3</td><td>P04</td><td>SchoolBag</td><td>730</td><td>70</td></tr></tbody></table> <p>Write suitable Python statements for the following:</p> <ul style="list-style-type: none"><li>i. Add a column called ACC_NO with the following data:<br/>[135,153,225,442].</li><li>ii. Add a new Record</li><li>iii. Remove the column qty.</li><li>iv. Remove first and third rows from DataFrame</li></ul> |             | Pcd   | title | Price | qty | 0 | P01 | Notebook | 85  | 500 | 1 | P02 | Pencilbox | 76  | 200 | 2 | P03 | WaterBottle | 129 | 50 | 3 | P04 | SchoolBag | 730 | 70 | 4 |
|      | Pcd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | title       | Price | qty   |       |     |   |     |          |     |     |   |     |           |     |     |   |     |             |     |    |   |     |           |     |    |   |
| 0    | P01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Notebook    | 85    | 500   |       |     |   |     |          |     |     |   |     |           |     |     |   |     |             |     |    |   |     |           |     |    |   |
| 1    | P02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Pencilbox   | 76    | 200   |       |     |   |     |          |     |     |   |     |           |     |     |   |     |             |     |    |   |     |           |     |    |   |
| 2    | P03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | WaterBottle | 129   | 50    |       |     |   |     |          |     |     |   |     |           |     |     |   |     |             |     |    |   |     |           |     |    |   |
| 3    | P04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SchoolBag   | 730   | 70    |       |     |   |     |          |     |     |   |     |           |     |     |   |     |             |     |    |   |     |           |     |    |   |
| 2    | <p>Consider the given DataFrame df:</p> <table><thead><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th></tr></thead><tbody><tr><td>0</td><td>50</td><td>80</td><td>120</td><td>180</td></tr><tr><td>1</td><td>110</td><td>120</td><td>130</td><td>140</td></tr></tbody></table> <p>Write suitable Python statements for the following:</p> <ul style="list-style-type: none"><li>i. Add a column called E with the following data: [14,220].</li><li>ii. Add a new record with appropriate values.</li><li>iii. Remove the column A, C.</li><li>iv. Remove first and second rows from DataFrame.</li></ul>                                                                                                                                                             |             | A     | B     | C     | D   | 0 | 50  | 80       | 120 | 180 | 1 | 110 | 120       | 130 | 140 | 4 |     |             |     |    |   |     |           |     |    |   |
|      | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | B           | C     | D     |       |     |   |     |          |     |     |   |     |           |     |     |   |     |             |     |    |   |     |           |     |    |   |
| 0    | 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 80          | 120   | 180   |       |     |   |     |          |     |     |   |     |           |     |     |   |     |             |     |    |   |     |           |     |    |   |
| 1    | 110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 120         | 130   | 140   |       |     |   |     |          |     |     |   |     |           |     |     |   |     |             |     |    |   |     |           |     |    |   |

| 3 | <p>Consider the given DataFrame 'temp':</p> <table><thead><tr><th></th><th>city</th><th>Maxtemp</th><th>Mintemp</th><th>Rainfall</th></tr></thead><tbody><tr><td>0</td><td>Delhi</td><td>40</td><td>32</td><td>24.1</td></tr><tr><td>1</td><td>Bengaluru</td><td>31</td><td>25</td><td>36.2</td></tr><tr><td>2</td><td>Chennai</td><td>35</td><td>27</td><td>40.8</td></tr><tr><td>3</td><td>Mumbai</td><td>29</td><td>21</td><td>35.2</td></tr></tbody></table> <p>Write suitable Python statements for the following:</p> <ul style="list-style-type: none"><li>i. Add a column called area with the following data:<br/>[135455,153330,225000,442540].</li><li>ii. Add a new city named 'calcutta having maxtemp 20,mintemp 12 and rainfall</li><li>iii. Remove the column rainfall.</li><li>iv. iv.Remove first and third rows from DataFrame</li></ul> |         | city    | Maxtemp  | Mintemp | Rainfall | 0 | Delhi | 40   | 32    | 24.1  | 1 | Bengaluru | 31 | 25 | 36.2 | 2 | Chennai | 35 | 27 | 40.8 | 3 | Mumbai | 29 | 21 | 35.2 | 4 |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|----------|---------|----------|---|-------|------|-------|-------|---|-----------|----|----|------|---|---------|----|----|------|---|--------|----|----|------|---|
|   | city                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Maxtemp | Mintemp | Rainfall |         |          |   |       |      |       |       |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 0 | Delhi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 40      | 32      | 24.1     |         |          |   |       |      |       |       |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 1 | Bengaluru                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 31      | 25      | 36.2     |         |          |   |       |      |       |       |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 2 | Chennai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 35      | 27      | 40.8     |         |          |   |       |      |       |       |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 3 | Mumbai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 29      | 21      | 35.2     |         |          |   |       |      |       |       |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 4 | <p>Consider the given DataFrame df:</p> <table><thead><tr><th></th><th>Qtr1</th><th>Qtr2</th><th>Qtr3</th><th>Qtr4</th></tr></thead><tbody><tr><td>0</td><td>5000</td><td>8000</td><td>12000</td><td>18000</td></tr><tr><td>1</td><td>10</td><td>20</td><td>30</td><td>40</td></tr></tbody></table> <p>Write suitable Python statements for the following:</p> <ul style="list-style-type: none"><li>i. Add a column called Qtr5 with the following data: [1444,20].</li><li>ii. Add a new record with appropriate values.</li><li>iii. Remove the column Qtr1, Qtr3.</li><li>iv. iv.Remove first and second rows from DataFrame.</li></ul>                                                                                                                                                                                                                 |         | Qtr1    | Qtr2     | Qtr3    | Qtr4     | 0 | 5000  | 8000 | 12000 | 18000 | 1 | 10        | 20 | 30 | 40   |   |         |    |    |      |   |        |    |    |      |   |
|   | Qtr1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Qtr2    | Qtr3    | Qtr4     |         |          |   |       |      |       |       |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 0 | 5000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8000    | 12000   | 18000    |         |          |   |       |      |       |       |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |
| 1 | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 20      | 30      | 40       |         |          |   |       |      |       |       |   |           |    |    |      |   |         |    |    |      |   |        |    |    |      |   |

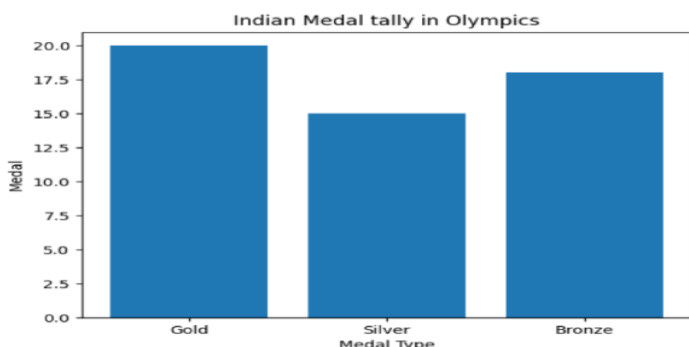
### Answers:

| Q.N. | ANSWERS                                                                                                                                                                                                                        | Marks |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1    | <ol style="list-style-type: none"> <li>temp['ACC_NO ']=[135,153,225,442]</li> <li>temp.loc[4]=['p05','bigbook',20,20]</li> <li>temp.drop(['qty'],axis=1,inplace=True)</li> <li>temp.drop([0,2],axis=0,inplace=True)</li> </ol> | 4     |

|   |                                                                                                                                                                                                                                          |   |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 2 | i. <code>df['E']=[14,220]</code><br>ii. <code>df.loc[2]=[11,22,33,40,50]</code><br>iii. <code>df.drop(['A','C'],axis=1,inplace=True)</code><br>iv. <code>df.drop([0,1],axis=0,inplace=True)</code>                                       | 4 |
| 3 | i. <code>temp['area ']=[135,150,200,440]</code><br>ii. <code>temp.loc[4]=['calcutta',20,12,10.2,252522]</code><br>iii. <code>temp.drop(['rainfall'],axis=1,inplace=True)</code><br>iv. <code>temp.drop([0,2],axis=0,inplace=True)</code> |   |
| 4 | i. <code>df['Qtr5']=[1444,20]</code><br>ii. <code>df.loc[2]=[11,22,33,40,50]</code><br>iii. <code>df.drop(['Qtr1','Qtr3'],axis=1,inplace=True)</code><br>iv. <code>df.drop([0,1],axis=0,inplace=True)</code>                             |   |

### **Question Type: Long Type Questions-2**

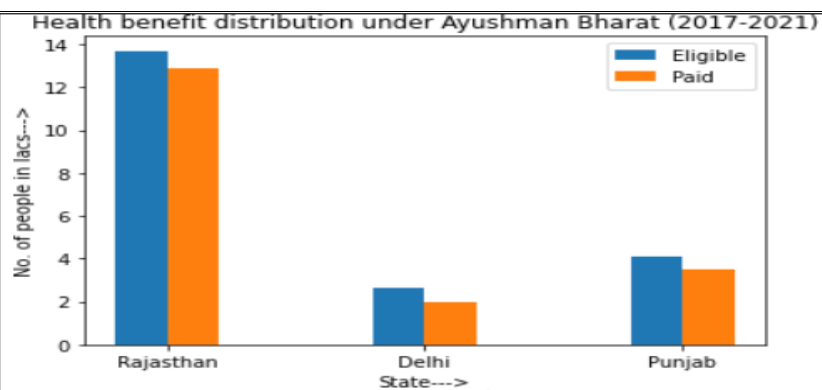
| Q1     | <div>Consider the DataFrame df shown below:</div> <div>DataFrame: df</div> <table><tr><th>BookID</th><th>Title</th><th>Author</th><th>Year</th><th>Price</th></tr><tr><td>0</td><td>The Alchemist</td><td>Paulo Coelho</td><td>1988</td><td>499</td></tr><tr><td>1</td><td>The Da VinciCode</td><td>Dan Brown</td><td>2003</td><td>350</td></tr><tr><td>2</td><td>Sapiens</td><td>Yuval Noah Harari</td><td>2011</td><td>599</td></tr><tr><td>3</td><td>Atomic Habits</td><td>James Clear</td><td>2018</td><td>450</td></tr><tr><td>4</td><td>Becoming</td><td>Michelle Obama</td><td>2018</td><td>550</td></tr></table> <div>Write Python statements for the DataFrame df to:</div> <div>I. Print the first three rows of the DataFrame df.</div> <div>II. Display titles of all the books.</div> <div>III. Remove the column Price.</div> <div>IV. Display the data of the 'Title' column from indexes 1 to 3 (both included).</div> | BookID            | Title | Author | Year | Price | 0 | The Alchemist | Paulo Coelho | 1988 | 499 | 1 | The Da VinciCode | Dan Brown | 2003 | 350 | 2 | Sapiens | Yuval Noah Harari | 2011 | 599 | 3 | Atomic Habits | James Clear | 2018 | 450 | 4 | Becoming | Michelle Obama | 2018 | 550 | 5 |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|--------|------|-------|---|---------------|--------------|------|-----|---|------------------|-----------|------|-----|---|---------|-------------------|------|-----|---|---------------|-------------|------|-----|---|----------|----------------|------|-----|---|
| BookID | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Author            | Year  | Price  |      |       |   |               |              |      |     |   |                  |           |      |     |   |         |                   |      |     |   |               |             |      |     |   |          |                |      |     |   |
| 0      | The Alchemist                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Paulo Coelho      | 1988  | 499    |      |       |   |               |              |      |     |   |                  |           |      |     |   |         |                   |      |     |   |               |             |      |     |   |          |                |      |     |   |
| 1      | The Da VinciCode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Dan Brown         | 2003  | 350    |      |       |   |               |              |      |     |   |                  |           |      |     |   |         |                   |      |     |   |               |             |      |     |   |          |                |      |     |   |
| 2      | Sapiens                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Yuval Noah Harari | 2011  | 599    |      |       |   |               |              |      |     |   |                  |           |      |     |   |         |                   |      |     |   |               |             |      |     |   |          |                |      |     |   |
| 3      | Atomic Habits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | James Clear       | 2018  | 450    |      |       |   |               |              |      |     |   |                  |           |      |     |   |         |                   |      |     |   |               |             |      |     |   |          |                |      |     |   |
| 4      | Becoming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Michelle Obama    | 2018  | 550    |      |       |   |               |              |      |     |   |                  |           |      |     |   |         |                   |      |     |   |               |             |      |     |   |          |                |      |     |   |

|     | V. Rename the column name 'Title' to 'Book_Title'.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |        |        |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------|--------|-------|------|---------|---------------|-----------|-----|--------|------|----------------|-----------|-----|------|-----|----------------|------------|------|------|-----|------------------|------------|-----|------|---|
| Q2  | <p>Consider the following data frame book and answer the questions.</p> <table><thead><tr><th></th><th>Title</th><th>Author</th><th>Price</th><th>Year</th></tr></thead><tbody><tr><td>101</td><td>India Shining</td><td>Milan Sen</td><td>520</td><td>2024</td></tr><tr><td>102</td><td>Indian Tourism</td><td>Romit Ray</td><td>650</td><td>2023</td></tr><tr><td>103</td><td>Indian Culture</td><td>Dhruv Jain</td><td>270</td><td>2023</td></tr><tr><td>104</td><td>Indian Festivals</td><td>Kishan Roy</td><td>300</td><td>2022</td></tr></tbody></table> <p>Write Python statements for the Data Frame book to:</p> <p>i. Print the first two rows of the Data Frame book.</p> <p>ii. Display author of all the books.</p> <p>iii. Add the column Publisher.</p> <p>iv. Display the Title, Author and Price of books with row index 102 and 103.</p> <p>v. Rename the column name 'Year' to 'Year of Publish'</p> |            | Title  | Author | Price | Year | 101     | India Shining | Milan Sen | 520 | 2024   | 102  | Indian Tourism | Romit Ray | 650 | 2023 | 103 | Indian Culture | Dhruv Jain | 270  | 2023 | 104 | Indian Festivals | Kishan Roy | 300 | 2022 | 5 |
|     | Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Author     | Price  | Year   |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| 101 | India Shining                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Milan Sen  | 520    | 2024   |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| 102 | Indian Tourism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Romit Ray  | 650    | 2023   |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| 103 | Indian Culture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Dhruv Jain | 270    | 2023   |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| 104 | Indian Festivals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Kishan Roy | 300    | 2022   |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| Q3  | <p>During an Olympic Games, write Python code to plot a bar chart for India’s medal tally as shown below:</p> <p>This bar chart represents Medal Category=['Gold', 'Silver', 'Bronze'] and Number of Medal=[20,15,18] as shown in figure. Also give code to save the figure as ‘aa.jpg’.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3          |        |        |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| Q4  | <p>Give the output of the command that follow based on the DataFrame DF below:</p> <table><thead><tr><th></th><th>AUTHOR</th><th>PRICE</th><th>QTY</th></tr></thead><tbody><tr><td>C1</td><td>WILLIAM</td><td>1500</td><td>42</td></tr><tr><td>C2</td><td>AGATHA</td><td>1300</td><td>85</td></tr><tr><td>C3</td><td>LEO</td><td>600</td><td>48</td></tr><tr><td>C4</td><td>ALEXANDER</td><td>1200</td><td>17</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            | AUTHOR | PRICE  | QTY   | C1   | WILLIAM | 1500          | 42        | C2  | AGATHA | 1300 | 85             | C3        | LEO | 600  | 48  | C4             | ALEXANDER  | 1200 | 17   | 5   |                  |            |     |      |   |
|     | AUTHOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PRICE      | QTY    |        |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| C1  | WILLIAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1500       | 42     |        |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| C2  | AGATHA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1300       | 85     |        |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| C3  | LEO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 600        | 48     |        |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |
| C4  | ALEXANDER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1200       | 17     |        |       |      |         |               |           |     |        |      |                |           |     |      |     |                |            |      |      |     |                  |            |     |      |   |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |       |       |       |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|------|----|----|------|----|----|------|----|----|------|----|----|---|----|----|---|----|----|---|----|----|---|----|----|---|
|      | <div>C5JIN80015</div> <div>C6CAO170020</div> <div>a) &gt;&gt;&gt; DF['PRICE']&gt;=1000</div> <div>b) &gt;&gt;&gt; DF[DF['QTY']&lt;=50]</div> <div>c) &gt;&gt;&gt; DF['QTY']%5</div> <div>d) &gt;&gt;&gt; DF.iloc[[2,3],[1,2]]</div> <div>e)&gt;&gt;&gt;DF.QTY[2]=300</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |       |       |       |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| Q5   | <div>Atul has stored some data in a DataFrame “MDF” as shown below. He wants to shift the data to CSV file. Write commands for questions that follow:</div> <div><table><tr><td>YEAR</td><td>SALES</td><td>LOSS</td></tr><tr><td>2001</td><td>85</td><td>42</td></tr><tr><td>2002</td><td>75</td><td>15</td></tr><tr><td>2003</td><td>64</td><td>62</td></tr><tr><td>2004</td><td>93</td><td>78</td></tr><tr><td>2005</td><td>67</td><td>52</td></tr></table></div> <div>a) What is the full form of CSV</div> <div>b) A CSV file can take ‘;’ character as separator</div> <div>A) TrueB) False</div> <div>c) To convert the above DataFrame “MDF” to a CSV file “TEXT.CSV”</div> <div>d) To read and display the CSV file “TEXT.CSV” thus formed without header</div> <div>e) To delete the column LOSS</div> | YEAR  | SALES | LOSS  | 2001  | 85    | 42    | 2002 | 75 | 15 | 2003 | 64 | 62 | 2004 | 93 | 78 | 2005 | 67 | 52 | 5 |    |    |   |    |    |   |    |    |   |    |    |   |
| YEAR | SALES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | LOSS  |       |       |       |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| 2001 | 85                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 42    |       |       |       |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| 2002 | 75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 15    |       |       |       |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| 2003 | 64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 62    |       |       |       |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| 2004 | 93                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 78    |       |       |       |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| 2005 | 67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 52    |       |       |       |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| Q6   | <div>Write the code in Pandas to create the following DataFrames <b>df1</b> and <b>df2</b>.</div> <div><table><tr><td></td><td>mark1</td><td>mark2</td><td></td><td>mark1</td><td>mark2</td></tr><tr><td>0</td><td>10</td><td>20</td><td>0</td><td>10</td><td>20</td></tr><tr><td>1</td><td>40</td><td>45</td><td>1</td><td>40</td><td>45</td></tr><tr><td>2</td><td>15</td><td>30</td><td>2</td><td>15</td><td>30</td></tr><tr><td>3</td><td>40</td><td>70</td><td>3</td><td>40</td><td>70</td></tr></table></div> <div>Write the commands to do the following operations on the DataFrames given below:</div> <div>(i) To add DataFrames df1 and df2.</div>                                                                                                                                                   |       | mark1 | mark2 |       | mark1 | mark2 | 0    | 10 | 20 | 0    | 10 | 20 | 1    | 40 | 45 | 1    | 40 | 45 | 2 | 15 | 30 | 2 | 15 | 30 | 3 | 40 | 70 | 3 | 40 | 70 | 5 |
|      | mark1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | mark2 |       | mark1 | mark2 |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| 0    | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 20    | 0     | 10    | 20    |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| 1    | 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 45    | 1     | 40    | 45    |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| 2    | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 30    | 2     | 15    | 30    |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |
| 3    | 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 70    | 3     | 40    | 70    |       |       |      |    |    |      |    |    |      |    |    |      |    |    |   |    |    |   |    |    |   |    |    |   |    |    |   |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |        |        |        |     |       |    |     |     |        |    |     |     |      |    |     |     |         |    |     |     |         |    |     |   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-----|-------|----|-----|-----|--------|----|-----|-----|------|----|-----|-----|---------|----|-----|-----|---------|----|-----|---|
|     | (ii) To subtract df2 from df1.<br>(iii) To Rename column marki as marks1 in both the DataFrames df1 and df2.<br>(iv) To change index label of df1 from 0 to zero and from 1 to one.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |        |        |        |     |       |    |     |     |        |    |     |     |      |    |     |     |         |    |     |     |         |    |     |   |
| Q7  | Consider the DataFrame below and answer the questions that follow:<br><br><table><tr><td></td><td>Name</td><td>Weight</td><td>Height</td></tr><tr><td>A_1</td><td>Pawan</td><td>50</td><td>153</td></tr><tr><td>A 2</td><td>Piyush</td><td>60</td><td>165</td></tr><tr><td>A 3</td><td>Prem</td><td>40</td><td>160</td></tr><tr><td>A 4</td><td>Prakash</td><td>70</td><td>145</td></tr><tr><td>A 5</td><td>Prateek</td><td>55</td><td>160</td></tr></table><br>(a) Which command will produce the following output to extract only a part of dataframe?<br>Piyush 60<br>Prem 40<br>Prakash 70<br>(b) What is the correct syntax to display the record of Piyush?<br>(i) df_data[df_data['Name']='Piyush']<br>(ii) df_data[df_data['Name']=='Piyush']<br>(iii) df_data[df_data.Name=='Piyush']<br>(iv) df_data['Name']=='Piyush'<br>(c) What is the output of the following command?<br><b>&gt;&gt;&gt; df_data.max()</b><br>(d) How do you display only the index of the dataframe df_data?<br>(e) What is the shape of the dataframe df_data? |        | Name   | Weight | Height | A_1 | Pawan | 50 | 153 | A 2 | Piyush | 60 | 165 | A 3 | Prem | 40 | 160 | A 4 | Prakash | 70 | 145 | A 5 | Prateek | 55 | 160 | 3 |
|     | Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Weight | Height |        |        |     |       |    |     |     |        |    |     |     |      |    |     |     |         |    |     |     |         |    |     |   |
| A_1 | Pawan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 50     | 153    |        |        |     |       |    |     |     |        |    |     |     |      |    |     |     |         |    |     |     |         |    |     |   |
| A 2 | Piyush                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 60     | 165    |        |        |     |       |    |     |     |        |    |     |     |      |    |     |     |         |    |     |     |         |    |     |   |
| A 3 | Prem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 40     | 160    |        |        |     |       |    |     |     |        |    |     |     |      |    |     |     |         |    |     |     |         |    |     |   |
| A 4 | Prakash                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 70     | 145    |        |        |     |       |    |     |     |        |    |     |     |      |    |     |     |         |    |     |     |         |    |     |   |
| A 5 | Prateek                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 55     | 160    |        |        |     |       |    |     |     |        |    |     |     |      |    |     |     |         |    |     |     |         |    |     |   |
| Q8  | The heights of 10 students of eighth grade are given below:<br><br><b>Height_cms=[145,141,142,142,143,144,141,140,143,144]</b><br><br>Write suitable Python code to generate a histogram based on the given data, along with an appropriate chart title and both axis labels.<br><br>Also give suitable python statement to save this chart.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5      |        |        |        |     |       |    |     |     |        |    |     |     |      |    |     |     |         |    |     |     |         |    |     |   |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |         |         |          |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|---------|----------|---------|----------|---|--------|-----|-----|-----|------|---|--------|-----|-----|-----|------|---|---------|-----|-----|-----|------|---|---------|----|----|----|------|--|
| Q9  | <p>Ekam, a Data Analyst with a multinational brand has designed the DataFrame df that contains the four quarter's sales data of different stores as shown below:</p> <table><tr><td></td><td>Store</td><td>Qtr1</td><td>Qtr2</td><td>Qtr3</td><td>Qtr4</td></tr><tr><td>0</td><td>Store1</td><td>300</td><td>240</td><td>450</td><td>230</td></tr><tr><td>1</td><td>Store2</td><td>350</td><td>340</td><td>403</td><td>210</td></tr><tr><td>2</td><td>Store3</td><td>250</td><td>180</td><td>145</td><td>160</td></tr></table> <p>Answer the following questions:</p> <p>i. Predict the output of the following python statement:</p> <p>a. print(df.size)</p> <p>b. print(df[1:3])</p> <p>ii. Delete the last row from the DataFrame.</p> <p>iii. Write Python statement to add a new column Total_Sales which is the addition of all the 4 quarter sales.</p>                                                                                              |         | Store   | Qtr1    | Qtr2     | Qtr3    | Qtr4     | 0 | Store1 | 300 | 240 | 450 | 230  | 1 | Store2 | 350 | 340 | 403 | 210  | 2 | Store3  | 250 | 180 | 145 | 160  | 4 |         |    |    |    |      |  |
|     | Store                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Qtr1    | Qtr2    | Qtr3    | Qtr4     |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
| 0   | Store1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 300     | 240     | 450     | 230      |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
| 1   | Store2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 350     | 340     | 403     | 210      |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
| 2   | Store3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 250     | 180     | 145     | 160      |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
| Q10 | <p>Ram designed the DataFrame df that contains the temperature of different cities as shown below:</p> <table><tr><td></td><td>City</td><td>Maxtemp</td><td>Mintemp</td><td>Avgtemp</td><td>Rainfall</td></tr><tr><td>0</td><td>Delhi</td><td>40</td><td>32</td><td>35</td><td>24.1</td></tr><tr><td>1</td><td>Mumbai</td><td>31</td><td>23</td><td>27</td><td>32.6</td></tr><tr><td>2</td><td>Chennai</td><td>29</td><td>21</td><td>25</td><td>26.2</td></tr><tr><td>3</td><td>Lucknow</td><td>38</td><td>18</td><td>24</td><td>25.5</td></tr></table> <p>Write python statement for the DataFrame df to :</p> <p>(a) print the size of the dataframe df</p> <p>(b) Print the first two rows of the DataFrame df</p> <p>(c) Delete the last row from the DataFrame df.</p> <p>(d) Write python statement to add a new city named 'Kolkata' having Maxtemp 28, Mintemp 19, Avgtemp 24, Rainfall 20.1</p> <p>(e) Rename the column 'City' to 'Green City'</p> |         | City    | Maxtemp | Mintemp  | Avgtemp | Rainfall | 0 | Delhi  | 40  | 32  | 35  | 24.1 | 1 | Mumbai | 31  | 23  | 27  | 32.6 | 2 | Chennai | 29  | 21  | 25  | 26.2 | 3 | Lucknow | 38 | 18 | 24 | 25.5 |  |
|     | City                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Maxtemp | Mintemp | Avgtemp | Rainfall |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
| 0   | Delhi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 40      | 32      | 35      | 24.1     |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
| 1   | Mumbai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 31      | 23      | 27      | 32.6     |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
| 2   | Chennai                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 29      | 21      | 25      | 26.2     |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
| 3   | Lucknow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 38      | 18      | 24      | 25.5     |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |
| Q11 | <p>Write down the python code to draw the bar chart using the diagram given below, also save the output as a svg.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4       |         |         |          |         |          |   |        |     |     |     |      |   |        |     |     |     |      |   |         |     |     |     |      |   |         |    |    |    |      |  |



Q12 Write a python program to plot a line chart based on the given data to showcase the trend of loan applications received by the banks from 2014 to 2018.

**Financial Year                      Number of Applications Received**

**2014-15                                  254420**

**2015-16                                  261257**

**2016-17                                  215422**

**2017-18                                  242433**

**2018-19                                  238989**

Q13 What are the purpose of following statements

**1. df.columns**

**2. df.iloc[ : , :-5]**

**3. df[2:8]**

**4. df[ : ]**

**5. df.iloc[ : -4 , : ]**

Q14 Plot the following data using a line plot:

| Day          | 1    | 2    | 3    | 4    | 5    | 6    | 7    |
|--------------|------|------|------|------|------|------|------|
| Tickets Sold | 2000 | 2800 | 3000 | 2500 | 2300 | 2500 | 1000 |

- Before displaying the plot display "Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday" in place of Day 1, 2, 3, 4, 5, 6, 7
- Change the color of the line to 'Magenta'.

Q15 Collect data about colleges in Delhi University or any other university of your choice and number of courses they run for Science, Commerce and Humanities, store it in a CSV file and present it using a bar plot.

| Q16           | Collect the minimum and maximum temperature of your city for a month and present it using a histogram plot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|---------------|------|----|----|-----|------|-------------------------|-----|-----|-----|---------|-------|--------|-----|-------|----|----|----|----|-------|----|----|----|----|-------|----|----|----|----|-------|----|----|----|----|-------|----|----|----|----|--|
| Q17           | 4. Plot the following data on line chart: <table><tr><td>Runs in Overs</td><td>10</td><td>20</td></tr><tr><td>MI</td><td>110</td><td>224</td></tr><tr><td>RCB</td><td>85</td><td>210</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |        | Runs in Overs | 10   | 20 | MI | 110 | 224  | RCB                     | 85  | 210 | 5   |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| Runs in Overs | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20    |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| MI            | 110                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 224   |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| RCB           | 85                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 210   |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| Q18           | Write code to plot a line chart to depict the run rate of T20 match from given data: <table><tr><td>Overs</td><td>Runs</td></tr><tr><td>5</td><td>45</td></tr><tr><td>10</td><td>79</td></tr><tr><td>15</td><td>145</td></tr><tr><td>20</td><td>234</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |        | Overs         | Runs | 5  | 45 | 10  | 79   | 15                      | 145 | 20  | 234 | 5       |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| Overs         | Runs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| 5             | 45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| 10            | 79                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| 15            | 145                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| 20            | 234                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| Q19           | Plot following data on bar graph:<br>English: 56,78,90,34<br>Science: 65,77,54,32<br>Maths: 45,67,43,41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |        | 5             |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| Q20           | Consider that a survey has to be done on how much distance the following vehicles have covered in a span of five days. The data collected can be plotted in different plotting methods. plot the data using <b>Line plot</b> : <table><tr><th colspan="5">BIKES</th></tr><tr><th rowspan="2">DAYS</th><th colspan="4">DISTANCE COVERED IN KMS</th></tr><tr><th>ENFIELD</th><th>HONDA</th><th>YAHAMA</th><th>KTM</th></tr><tr><td>DAY 1</td><td>50</td><td>80</td><td>70</td><td>80</td></tr><tr><td>DAY 2</td><td>40</td><td>20</td><td>20</td><td>20</td></tr><tr><td>DAY 3</td><td>70</td><td>20</td><td>60</td><td>20</td></tr><tr><td>DAY 4</td><td>80</td><td>50</td><td>40</td><td>50</td></tr><tr><td>DAY 5</td><td>20</td><td>60</td><td>60</td><td>60</td></tr></table> |       |        | BIKES         |      |    |    |     | DAYS | DISTANCE COVERED IN KMS |     |     |     | ENFIELD | HONDA | YAHAMA | KTM | DAY 1 | 50 | 80 | 70 | 80 | DAY 2 | 40 | 20 | 20 | 20 | DAY 3 | 70 | 20 | 60 | 20 | DAY 4 | 80 | 50 | 40 | 50 | DAY 5 | 20 | 60 | 60 | 60 |  |
| BIKES         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| DAYS          | DISTANCE COVERED IN KMS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |        |               |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
|               | ENFIELD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | HONDA | YAHAMA | KTM           |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| DAY 1         | 50                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 80    | 70     | 80            |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| DAY 2         | 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20    | 20     | 20            |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| DAY 3         | 70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20    | 60     | 20            |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| DAY 4         | 80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 50    | 40     | 50            |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |
| DAY 5         | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 60    | 60     | 60            |      |    |    |     |      |                         |     |     |     |         |       |        |     |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |       |    |    |    |    |  |

### Answers:

| Q.N. | ANSWERS                                                                                                                                                                                  | Marks |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1    | I. <code>print(df.head(3))</code><br>II. Display titles of all the books. <code>print(df['Title'])</code><br>III. Remove the column Price.<br><code>df = df.drop('Price', axis=1)</code> | 5     |

|   |                                                                                                                                                                                                                                                        |   |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|   | <pre>print(df) IV. Display the data of the 'Title' column from indexes 1 to 3 (both included). print(df.loc[1:3, 'Title']) V. Rename the column name 'Title' to 'Book_Title'. df.rename(columns={'Title': 'Book_Title'}, inplace=True) print(df)</pre> |   |
| 2 | <pre>i. book.head(2) ii. book.loc[:, 'Author'] iii. book['PUBLISHER']=list of appropriate publisher names iv. book.loc[:, 102:103] v. book=book.rename({'Year': 'Year of Publish ', axis='columns'})</pre>                                             | 5 |
| 3 | <pre>import matplotlib.pyplot as plt Category=['Gold','Silver','Bronze'] Medal=[20,15,18] plt.bar(Category,Medal) plt.ylabel('Medal') plt.xlabel('Category') plt.title('Indian Medal tally in Olympics') plt.show() plt.savefig("aa.jpg")</pre>        |   |
| 4 | <pre>a) C1 True C2 True C3 False C4 True C5 False C6 True b) AUTHOR PRICE QTY C1 WILLIAM 1500 42</pre>                                                                                                                                                 |   |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |       |     |    |     |    |    |      |    |        |       |     |             |     |     |  |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|-----|----|-----|----|----|------|----|--------|-------|-----|-------------|-----|-----|--|
|             | <p>C3    LEO                      600            48</p> <p>C4    ALEXANDER            1200           17</p> <p>C5    JIN                        800            15</p> <p>C6    CAO                      1700           20</p> <p>c)</p> <p>C1 2</p> <p>C2 0</p> <p>C3 3</p> <p>C4 2</p> <p>C5 0</p> <p>C6 0</p> <p>d)</p> <table> <tr> <td></td><td>PRICE</td><td>QTY</td></tr> <tr> <td>C3</td><td>600</td><td>48</td></tr> <tr> <td>C4</td><td>1200</td><td>17</td></tr> </table> <p>e)</p> <table> <tr> <td>AUTHOR</td><td>PRICE</td><td>QTY</td></tr> <tr> <td>LEO TOLSTOY</td><td>600</td><td>300</td></tr> </table> |     | PRICE | QTY | C3 | 600 | 48 | C4 | 1200 | 17 | AUTHOR | PRICE | QTY | LEO TOLSTOY | 600 | 300 |  |
|             | PRICE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | QTY |       |     |    |     |    |    |      |    |        |       |     |             |     |     |  |
| C3          | 600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 48  |       |     |    |     |    |    |      |    |        |       |     |             |     |     |  |
| C4          | 1200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 17  |       |     |    |     |    |    |      |    |        |       |     |             |     |     |  |
| AUTHOR      | PRICE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | QTY |       |     |    |     |    |    |      |    |        |       |     |             |     |     |  |
| LEO TOLSTOY | 600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 300 |       |     |    |     |    |    |      |    |        |       |     |             |     |     |  |
| 5           | <p>a) Comma Separated Values</p> <p>b) True</p> <p>c) MDF.to_csv("TEXT.CSV")</p> <p>d)    import pandas as pd</p> <p>      pd.read_csv("TEXT.CSV",header=None)</p> <p>e) del MDF['LOSS']</p>                                                                                                                                                                                                                                                                                                                                                                                                                              |     |       |     |    |     |    |    |      |    |        |       |     |             |     |     |  |
| 6           | <p>import numpy as np</p> <p>import pandas as pd</p> <p>df1=pd.DataFrame({'mark1': [10, 40, 15, 40],'mark2': [20, 45, 30, 70]})</p> <p>df2=pd.DataFrame({'mark1':[10,20,25,50],'mark2': [15, 25, 30, 30]})</p> <p>print(df1)</p> <p>print(df2)</p> <p>(i) print (df1.add(df2))</p>                                                                                                                                                                                                                                                                                                                                        |     |       |     |    |     |    |    |      |    |        |       |     |             |     |     |  |



|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 10 | (a) print(df.size)<br>(b) df[0:2] or df.loc[0:1] or df.iloc[0:2]<br>(c) df=df.drop(3,axis=0) or df.drop(3,axis=0,inplace=True)<br>(d) df.loc[3]=['Kolkata',28,19,24,20.1]<br>(e) df.rename(columns={'City':'Green City'}, inplace=True)                                                                                                                                                                                                                                                                 | 5 |
| 11 | import matplotlib.pyplot as plt<br>import numpy as np x=np.array([1,2,3])<br>state=['Rajasthan','Delhi','Punjab']<br>eligible=[13.7,2.6,4.1]<br>paid=[12.9,2.0,3.5]<br>plt.bar(x-1,eligible,width=.2,label='Eligible')<br>plt.bar(x+1,paid,width=.2,label='Paid')<br>plt.xticks(ticks=x, labels=state)<br>plt.xlabel('State--->')<br>plt.ylabel('No. of people in lacs--->')<br>plt.title('Health benefit distribution under Ayushman Bharat (2017-2021)')<br>plt.legend()<br>plt.savefig('health.svg') | 4 |
| 12 | import matplotlib.pyplot as plt<br>session=['2014-15','2015-16','2016-17','2017-18','2018-19']<br>loan_applications=[254420,261257,215422,242433,238989]<br>plt.plot(session,loan_applications,'r:x')<br>plt.xlabel('Session--->')<br>plt.ylabel('Applications--->')<br>plt.title('Loan applications received by the banks of India')<br>plt.show()                                                                                                                                                     | 4 |
| 13 | 1. It displays the names of columns of the Dataframe.<br>2. It will display all columns except the last 5 columns.<br>3. It displays all columns with row index 2 to 7.<br>4. It will display entire dataframe with all rows and columns.                                                                                                                                                                                                                                                               | 5 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|    | 5. It will display all rows except the last 4 four rows.                                                                                                                                                                                                                                                                                                                                                                     |  |
| 14 | <pre> import pandas as pd  import matplotlib.pyplot as plt x=["Mon","Tue","Wed","Thu","Fri","Sat","Sun"] y=[2000,2800,3000,2500,2300,2500,1000]  plt.plot(x,y,color="magenta",marker="*", label="No. of tickets")  plt.title("Day wise Tickets sold ")  plt.xlabel("Days")  plt.ylabel("No of tickets sold")  plt.legend()  plt.grid(True)  plt.savefig("d:\ Tickets.jpg")  plt.show()</pre>                                 |  |
| 15 | <pre> import pandas as pd  import matplotlib.pyplot as p  df=pd.read_csv("D:\Python\IP NCERT XII Chapter 4\data.csv", index_col=0) print(df)  df.plot(kind="bar")  p.title("Stream wise number of courses ") p.xlabel("Stream")  p.ylabel("No of Courses") p.xticks(rotation="15") p.legend()  p.show()</pre>                                                                                                                |  |
| 16 | <pre> import pandas as pd  import matplotlib.pyplot as plt  min_temp=[6,5,6,5,5,5,4,9,11,12,14,15,12,13,11,11,8,7,10,10,9,9,7,8,9,5,6,6,7,10]  max_temp=[16,15,15,16,18,19,15,14,18,27,17,20,17,18,15,16,14,17,20,17,18,15,16]  plt.hist(min_temp,bins=5,color="brown",edgecolor="black") plt.title("Minimum Temperatures in city During Fenruary 2021") plt.ylabel("Frequency")  plt.xlabel("Temperature") plt.show()</pre> |  |
| 17 | <pre> import matplotlib.pyplot as mpp overs = [10,20]  mi = [110,224]</pre>                                                                                                                                                                                                                                                                                                                                                  |  |

|    |                                                                                                                                                                                  |  |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|    | <pre> mpp.plot(overs,mi,'blue') rcb=[109,210] mpp.plot(overs,rcb,'red') mpp.xlabel('Runs') mpp.ylabel('Overs') mpp.title('Match Summary') mpp.show() </pre>                      |  |
| 18 | <pre> import matplotlib as pp overs = [5,10,15,20] runs = [54,79,145,234] pp.plot(overs,runs) pp.xlabel('Overs') pp.ylabel('Runs') pp.show() </pre>                              |  |
| 19 | <pre> import matplotlib.pyplot as pp eng = [56,78,90,34] sci = [65,77,54,32] maths=[45,67,43,41] pp.bar(eng,sci,maths) pp.xlabel('Marks') pp.ylabel('Subjects') pp.show() </pre> |  |
| 20 | <pre> import matplotlib.pyplot as plt x = [1,2,3,4,5] y = [50,40,70,80,20] y2 = [80,20,20,50,60] y3 = [70,20,60,40,60] </pre>                                                    |  |

```

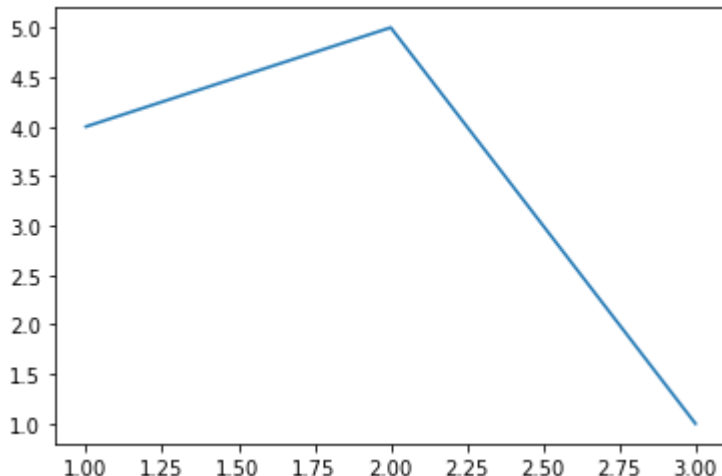
y4 = [80,20,20,50,60]
plt.plot(x,y,'g',label='Enfield', linewidth=5)
plt.plot(x,y2,'c',label='Honda',linewidth=5)
plt.plot(x,y3,'k',label='Yahama',linewidth=5)
plt.plot(x,y4,'y',label='KTM',linewidth=5)
plt.title('bike details in line plot')
plt.ylabel(' Distance in kms') plt.xlabel('Days')
plt.legend()
plt.show()

```

### **BORAD PAPERS QUESTIONS Section-A (1- Mark Questions)**

|   |                       |                                                                                                                                                                                                                                                                                                                                           |
|---|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | CBSE<br>Main<br>2026  | <p>In which scenario is a bar chart preferred over a line chart ?</p> <p>(A) To visualise monthly temperature trends over a year.<br/>         (B) To compare the number of students in different classes.<br/>         (C) To show stock price movements over time.<br/>         (D) To analyse trends in website traffic over days.</p> |
| 2 | CBSE<br>Compt<br>2026 | <p>While plotting a histogram in Python, the _____ of each column (bar) in the histogram is proportional to the number of data points contained in that bin.</p> <p>(A) Length<br/>         (B) Width<br/>         (C) Height<br/>         (D) Volume</p>                                                                                 |
| 3 | CBSE<br>Compt<br>2026 | <p>Mention any two main purposes of plotting data.</p>                                                                                                                                                                                                                                                                                    |
| 4 | CBSE<br>Main<br>2025  | <p>In Python which function of matplotlib library is used to save a plot ?</p> <p>(A) save ( )<br/>         (B) saveplot ( )<br/>         (C) export ( )<br/>         (D) savefig ( )</p>                                                                                                                                                 |

|    |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | CBSE<br>Compt<br>2025    | What is data visualization ? Also mention its any one main purpose.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 6  | CBSE<br>SQP<br>2025      | By default, the plot() function of Matplotlib draws a _____ plot.<br><br>(A) histogram<br>(B) column<br>(C) bar<br>(D) line                                                                                                                                                                                                                                                                                                                                                                             |
| 7  | CBSE<br>SQP<br>2025      | Which Matplotlib plot is best suited to represent changes in data over time?<br><br>(A) Bar plot<br>(B) Histogram<br>(C) Line plot<br>(D) Histogram & Bar plot                                                                                                                                                                                                                                                                                                                                          |
| 8  | CBSE<br>Compt<br>2023    | Assertion (A): In order to be able to use Python's data visualization library, we need to import the pyplot module from matplotlib library.<br>Reason (R): The pyplot module houses a variety of functions required to create and customize charts or graphs.<br><br>Choose correct option:<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True |
| 9  | CBSE<br>Compt<br>2022 T1 | Out of the following, which function cannot be used for customization of charts in Python?<br><br>a. xlabel ( )<br>b. colour ( )<br>c. title ( )<br>d. xticks ( )                                                                                                                                                                                                                                                                                                                                       |
| 10 | CBSE<br>Compt<br>2022 T1 | What is the minimum number of arguments required for plot() function in matplotlib?<br><br>a. 1<br>b. 2                                                                                                                                                                                                                                                                                                                                                                                                 |

|    |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                          | c. 3<br>d. 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 11 | CBSE<br>Compt<br>2022 T1 | <p>_____ is the function to save the graph.</p> <p>a. savefig ( )<br/> b. savefigure ( )<br/> c. savegraph ( )<br/> d. savechart ( )</p>                                                                                                                                                                                                                                                                                                                                       |
| 12 | CBSE<br>Compt<br>2022 T1 | <p>Observe the following figure. Identify the coding for obtaining this as output.</p>  <pre> import matplotlib.pyplot as plt plt.plot ([1,2],[4,5]) plt.show ( )  import matplotlib.pyplot as plt plt.plot ([1,2,3],[4,5,1]) plt.show ( )  import matplotlib.pyplot as plt plt.plot ([2,3],[5,1]) plt.show ( )  import matplotlib.pyplot as plt plt.plot ([1,3],[4,1]) plt.show ( ) </pre> |
| 13 | CBSE<br>Compt<br>2022 T1 | <p>Read the statements given below and identify the right option to draw a histogram.</p>                                                                                                                                                                                                                                                                                                                                                                                      |

|    |                    |                                                                                                                                                                                                                                                                                                                                                                                 |
|----|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                    | <p>Statement A: To make a Histogram with Matplotlib, we can use the plt.hist() function.</p> <p>Statement B: The bin parameter is compulsory to create histogram.</p> <p>a. Statement A and B are correct<br/> b. Statement A and B are incorrect<br/> c. Statement A is correct, but Statement B is incorrect<br/> d. Statement A is incorrect, but Statement B is correct</p> |
| 14 | CBSE Compt 2022 T1 | <p>Which graph should be used where each column represents a range of values, and the height of a column corresponds to how many values are in that range?</p> <p>a. plot<br/> b. line<br/> c. bar<br/> d. histogram</p>                                                                                                                                                        |

### Section-A (1- Mark Questions)

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | (B) To compare the number of students in different classes.                                                                                                                                                                                                                                                                                                                                                                                              |
| 2 | (C) Height                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 3 | <p>Any two of the following:</p> <ol style="list-style-type: none"> <li>1. To visually identify patterns, trends, and relationships in data that are not obvious from raw numbers.</li> <li>2. To communicate data findings clearly and effectively to others, aiding better and faster decision-making.</li> <li>3. To quickly compare different categories or values of data.</li> <li>4. To spot outliers, anomalies, or gaps in the data.</li> </ol> |
| 4 | (D) savefig()                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 5 | <p>Data visualization is the graphical representation of data/information using visual elements such as charts, graphs, and plots (bar charts, line charts, histograms, etc.)</p> <p>It makes large or complex data easier to understand at a glance, helping to identify patterns, trends, and relationships, and communicate insights effectively for decision-making</p>                                                                              |
| 6 | (D) line                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 7 | (C) Line plot                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|    |                                                                                    |
|----|------------------------------------------------------------------------------------|
| 8  | (i) Both A and R are true, and R is the correct explanation for A                  |
| 9  | (b) colour()                                                                       |
| 10 | (a) 1                                                                              |
| 11 | (a) savefig()                                                                      |
| 12 | (ii)<br>import matplotlib.pyplot as plt<br>plt.plot([1,2,3],[4,5,1])<br>plt.show() |
| 13 | (c) Statement A is correct, but Statement B is incorrec                            |
| 14 | (d) histogram                                                                      |

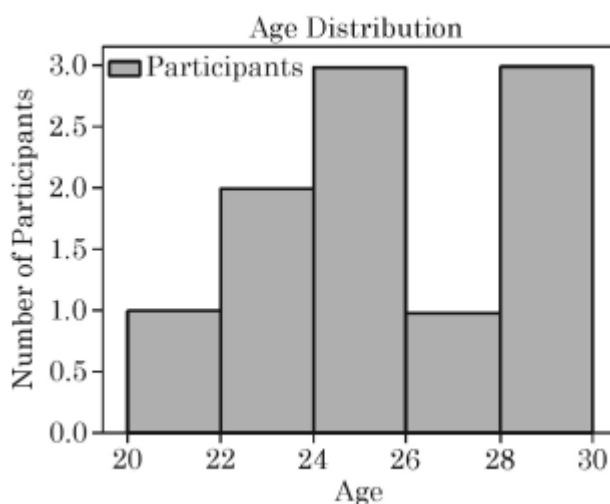
## Section - B (4 - Mark Questions)

1  
CBSE  
Main  
2026

Ms. Anjali, a data analyst, has been assigned the task of creating a histogram to display the age distribution of ten participants in a workshop. She has been provided with the following list of their ages :

Ages = [22, 25, 24, 28, 30, 24, 29, 27, 21, 23]

She has started writing a Python program for it. However, the code is incomplete. Help her complete the program by filling in the missing parts, so that the histogram as shown below is displayed.



```
import matplotlib.pyplot as plt
Ages = [22, 25, 24, 28, 30, 24, 29, 27, 21, 23]
binsize=[20,22,24,26,28,30]
plt._____(Ages, bins=binsize, edgecolor = 'black', label =
'Participants')
_____.xlabel('Age')
plt.ylabel('Number of Participants')
plt.title("Age Distribution")
plt._____
_____
```

# Statement-1  
# Statement-2  
  
# Statement-3  
# Statement-4

I. Write the suitable code for the blank space in the line marked as Statement-1 which plots the histogram.

II. Fill in the blank in Statement-2 to use the correct alias of the required module to set the label on x axis.

III. Fill in the blank in Statement-3 with the correct Python code to display the legend on the graph.

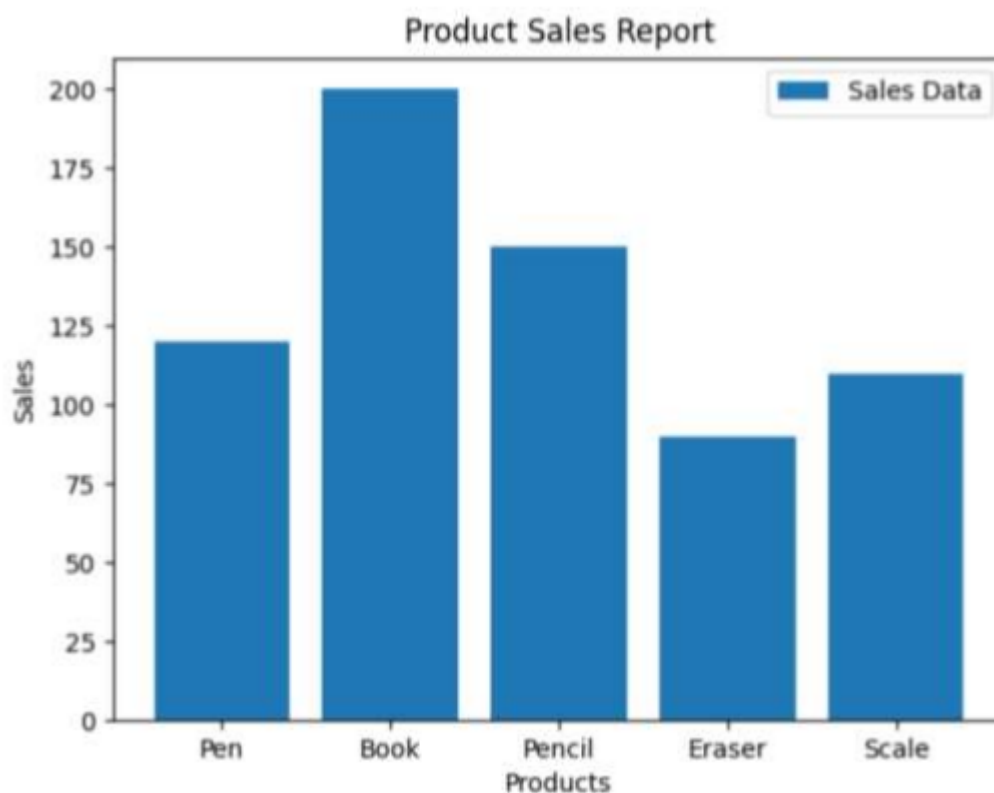
IV. Fill in the blank in Statement-4 with the appropriate Python code to display the graph.

2 CBSE  
Compt  
2026

A data analyst wants to compare the sales of 5 products through a bar chart based on the following sales data :

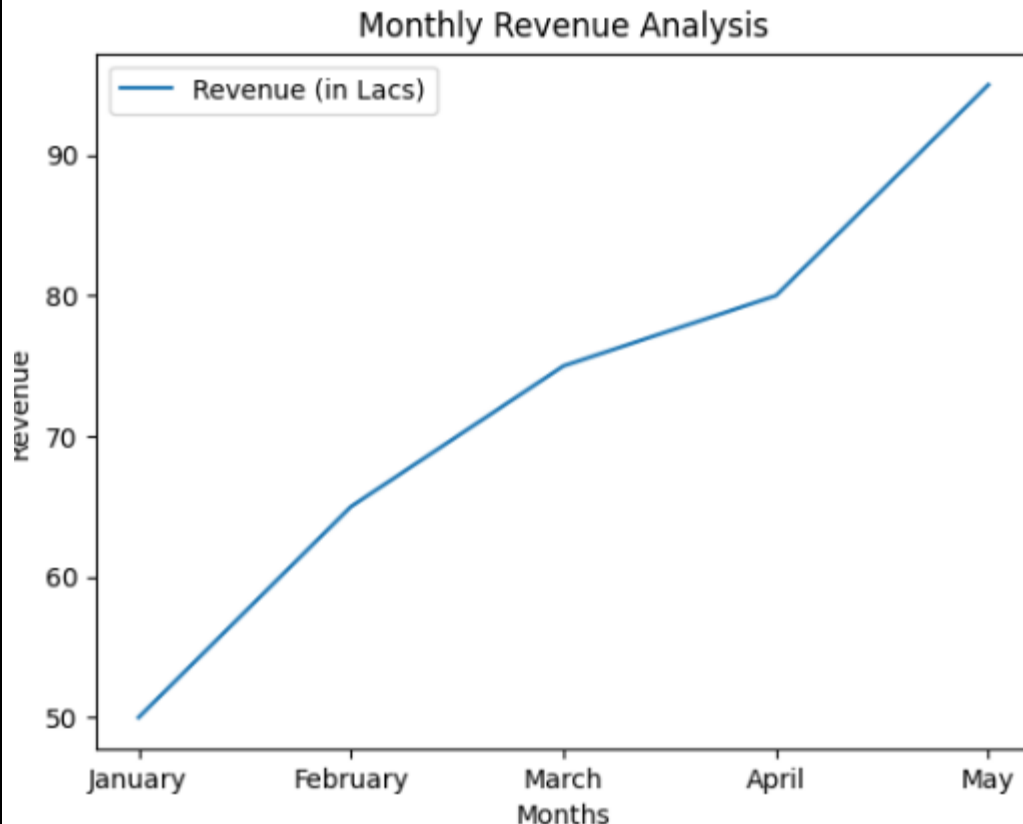
| Product | Sales |
|---------|-------|
| Pen     | 120   |
| Book    | 200   |
| Pencil  | 150   |
| Eraser  | 90    |
| Scale   | 110   |

He has started writing the Python code for it, but it is not complete. Help him by filling in the blanks in the given Python program so that the bar graph as shown below is displayed.



```
import matplotlib.pyplot as plt
Products = [_____] # Statement-1
Sales = [120, 200, 150, 90, 110]
plt.bar(_____, Sales, label='Sales Data') # Statement-2
plt.xlabel('Products')
plt.ylabel('Sales')
```

|          |                     | <pre>plt.legend() plt._____('Product Sales Report') plt._____('sales.png') plt.show()</pre> <p># Statement-3<br/># Statement-4</p> <p>(i) Refer to the graph shown above and fill in the blank in Statement-1 with suitable Python code.<br/>(ii) Write the suitable code for the blank space in the line marked as Statement-2, which plots the bar graph with the appropriate data.<br/>(iii) Fill in the blank in Statement-3 with the correct Python code to set the title of the graph.<br/>(iv) Fill in the blank in Statement-4 with the appropriate Python code to save the graph as an image file named 'sales.png'.</p> |       |                   |         |    |          |    |       |    |       |    |     |    |
|----------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------|---------|----|----------|----|-------|----|-------|----|-----|----|
| 3        | CBSE<br>SQP<br>2026 | <p>Rohan, a business analyst, is working on a Python program to create a line graph that represents the monthly revenue (in lakhs) of a company over five months. However, some parts of his code are incomplete. Help Rohan by filling in the blanks in the following Python program.</p> <table><tr><th>Month</th><th>Revenue (in Lacs)</th></tr><tr><td>January</td><td>50</td></tr><tr><td>February</td><td>65</td></tr><tr><td>March</td><td>75</td></tr><tr><td>April</td><td>80</td></tr><tr><td>May</td><td>95</td></tr></table>                                                                                          | Month | Revenue (in Lacs) | January | 50 | February | 65 | March | 75 | April | 80 | May | 95 |
| Month    | Revenue (in Lacs)   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                   |         |    |          |    |       |    |       |    |     |    |
| January  | 50                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                   |         |    |          |    |       |    |       |    |     |    |
| February | 65                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                   |         |    |          |    |       |    |       |    |     |    |
| March    | 75                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                   |         |    |          |    |       |    |       |    |     |    |
| April    | 80                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                   |         |    |          |    |       |    |       |    |     |    |
| May      | 95                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |                   |         |    |          |    |       |    |       |    |     |    |



Help Rohan to complete the code.

\_\_\_\_\_ as plt

#Statement-

1

Months = ['January', 'February', 'March', 'April', 'May']

Revenue = [50, 65, 75, 80, 95]

#Statement-

2

plt.xlabel('Months')

plt.ylabel('Revenue')

#Statement-

3

#Statement-

4

plt.legend()

plt.show()

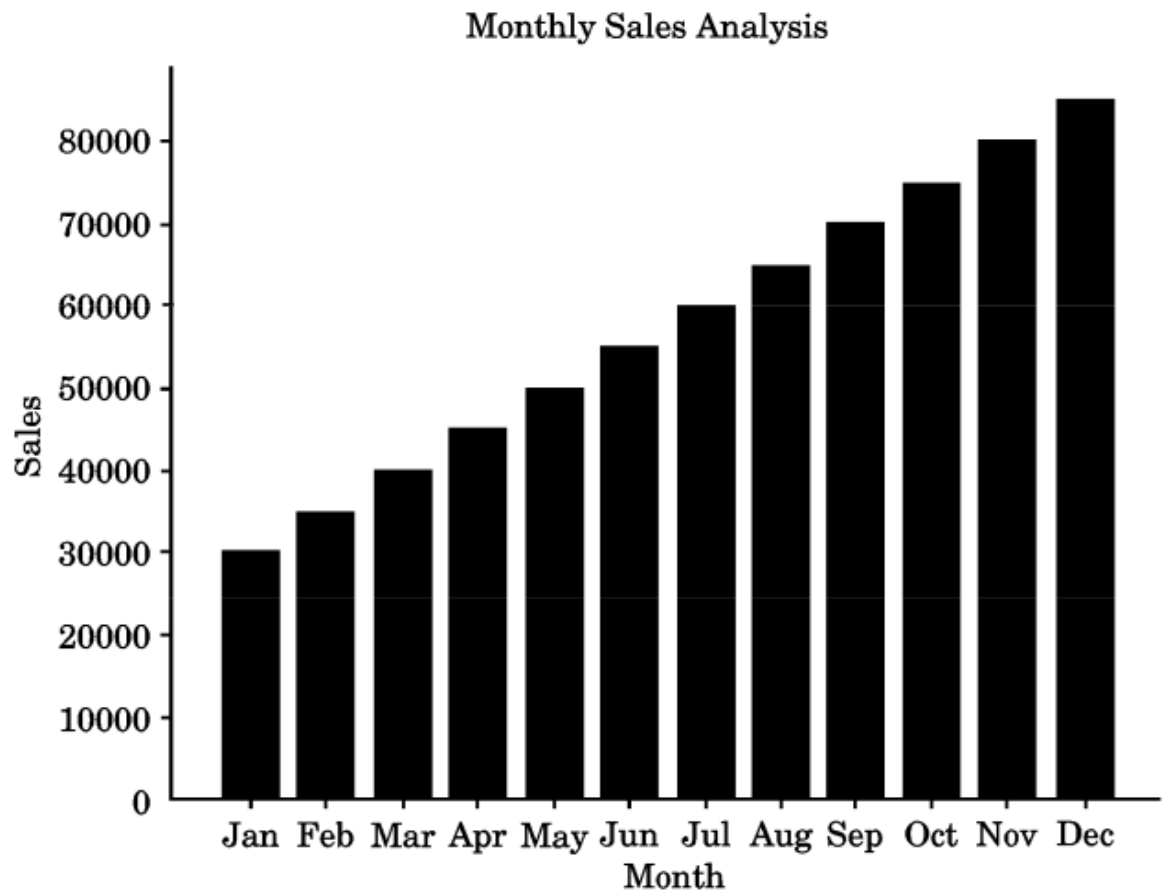
I. Write suitable code for Statement-1

II. Write the suitable code for the blank space in the line marked as Statement-2, which plots the line graph with the appropriate data and includes a label for the legend.

III. Fill in the blank in Statement-3 with the correct Python code to set the title of the graph.

|       |                | IV. Fill in the blank in Statement-4 with the appropriate Python code to save the graph as an image file named monthly_revenue.png.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |             |       |    |       |    |       |    |       |    |       |    |
|-------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------|-------|----|-------|----|-------|----|-------|----|-------|----|
| 4     | CBSE Main 2025 | <p>Gurkirat has to fill in the blanks in the given Python program that generates a line plot as shown below. The given line plot represents the temperature (in degree Celcius) over five days as given in the table :</p> <table><tr><th>Days</th><th>Temperature</th></tr><tr><td>Day 1</td><td>30</td></tr><tr><td>Day 2</td><td>32</td></tr><tr><td>Day 3</td><td>31</td></tr><tr><td>Day 4</td><td>29</td></tr><tr><td>Day 5</td><td>28</td></tr></table> <pre>import _____ as plt                                     # Statement-1 1 days = ['Day 1', 'Day 2', 'Day 3', 'Day 4', 'Day 5'] temp = [30, 32, 31, 29, 28] plt._____ (days, temp)                                     # Statement-2 2 plt.xlabel('_____')                                         # Statement-3 3 plt.ylabel ('Temperature') plt.title('_____')                                           # Statement-4 plt.show()</pre> <p>Write the missing statements according to the given specifications :</p> <p>(i) Write the suitable code to import the required module in the blank space in the line marked as Statement-1.</p> <p>(ii) Fill in the blank in Statement-2 with a suitable Python function name</p> | Days | Temperature | Day 1 | 30 | Day 2 | 32 | Day 3 | 31 | Day 4 | 29 | Day 5 | 28 |
| Days  | Temperature    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |             |       |    |       |    |       |    |       |    |       |    |
| Day 1 | 30             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |             |       |    |       |    |       |    |       |    |       |    |
| Day 2 | 32             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |             |       |    |       |    |       |    |       |    |       |    |
| Day 3 | 31             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |             |       |    |       |    |       |    |       |    |       |    |
| Day 4 | 29             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |             |       |    |       |    |       |    |       |    |       |    |
| Day 5 | 28             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |             |       |    |       |    |       |    |       |    |       |    |

|       |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
|-------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
|       |                       | to create a line plot.<br>(iii) Refer to the graph shown and fill in the blank in Statement-3 to display the appropriate label for x-axis.<br>(iv) Refer to the graph shown and fill in the blank in Statement-4 to display the suitable chart title.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| 5     | CBSE<br>Compt<br>2025 | <p>You are a data analyst at a retail company. The company wants to analyse its monthly sales data for the year 2024 to identify trends and make informed business decisions. The sales data has the following structure :</p> <table><tr><td>Month</td><td>Sales</td></tr><tr><td>Jan</td><td>30000</td></tr><tr><td>Feb</td><td>35000</td></tr><tr><td>Mar</td><td>40000</td></tr><tr><td>Apr</td><td>45000</td></tr><tr><td>May</td><td>50000</td></tr><tr><td>Jun</td><td>55000</td></tr><tr><td>Jul</td><td>60000</td></tr><tr><td>Aug</td><td>65000</td></tr><tr><td>Sep</td><td>70000</td></tr><tr><td>Oct</td><td>75000</td></tr><tr><td>Nov</td><td>80000</td></tr><tr><td>Dec</td><td>85000</td></tr></table> | Month | Sales | Jan | 30000 | Feb | 35000 | Mar | 40000 | Apr | 45000 | May | 50000 | Jun | 55000 | Jul | 60000 | Aug | 65000 | Sep | 70000 | Oct | 75000 | Nov | 80000 | Dec | 85000 |
| Month | Sales                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Jan   | 30000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Feb   | 35000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Mar   | 40000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Apr   | 45000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| May   | 50000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Jun   | 55000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Jul   | 60000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Aug   | 65000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Sep   | 70000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Oct   | 75000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Nov   | 80000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
| Dec   | 85000                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |

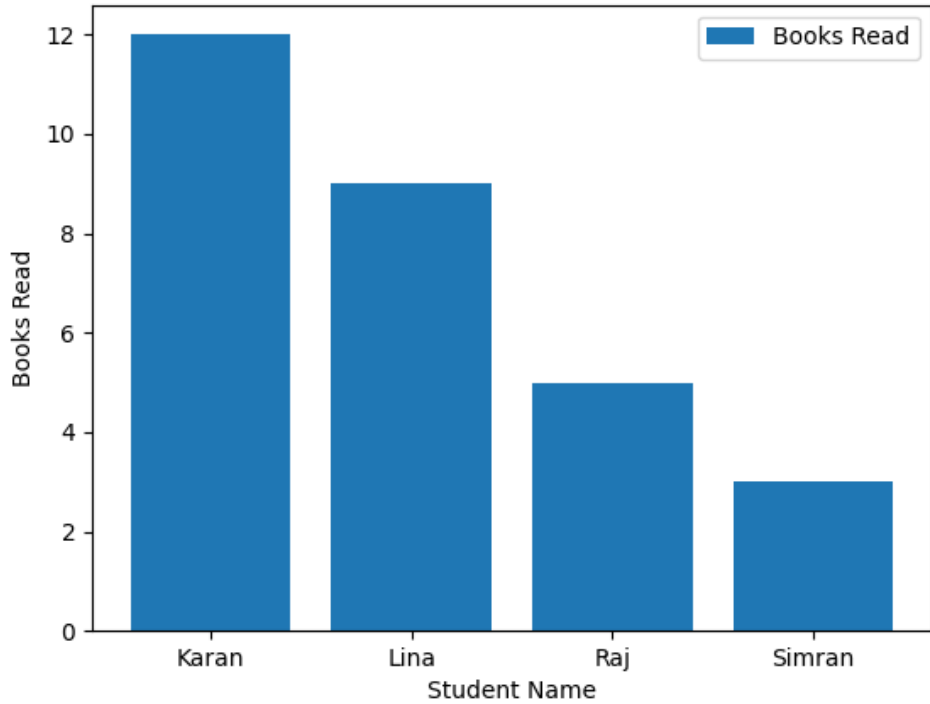


Complete the Python code to generate the following bar chart :

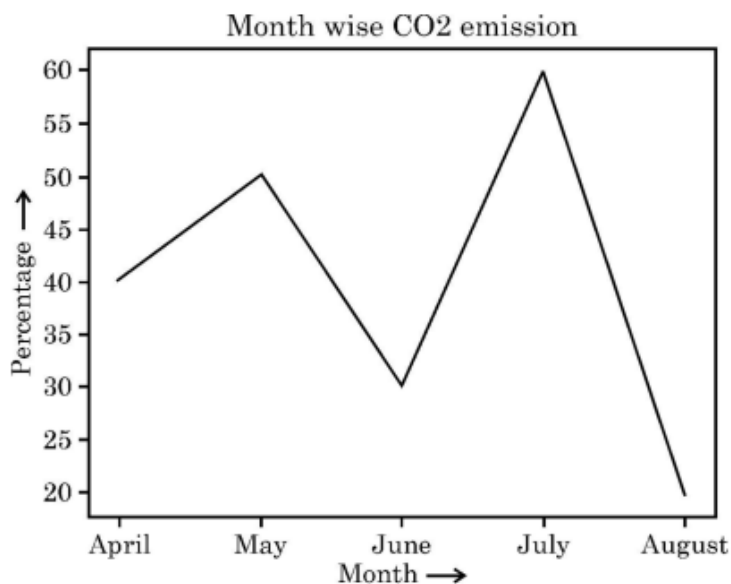
```
import _____ as plt #
Statement-1
import pandas as pd
months=['Jan','Feb','Mar','Apr','May','Jun','Jul','Aug','Sep','Oct','Nov','Dec']
sales=[30000,35000,40000,45000,50000,55000,60000,65000,70000,75000,80000,85000]
plt.bar(_____) #Statement-2
plt.title("_____")
#Statement-3
plt.xlabel("Month")
plt.ylabel("_____")
#Statement-4
plt.show()
```

(i) Write the Python code to import the required library , marked as Statement-1.

|  |  |                                                                                                                                                                                                                                                 |
|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | (ii) Write the Python code to draw the bar graph marked as Statement-2.<br>(iii) Write the Python code to add title to the graph marked as Statement-3.<br>(iv) Write Python code to add appropriate ylabel to the graph marked as Statement-4. |
|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

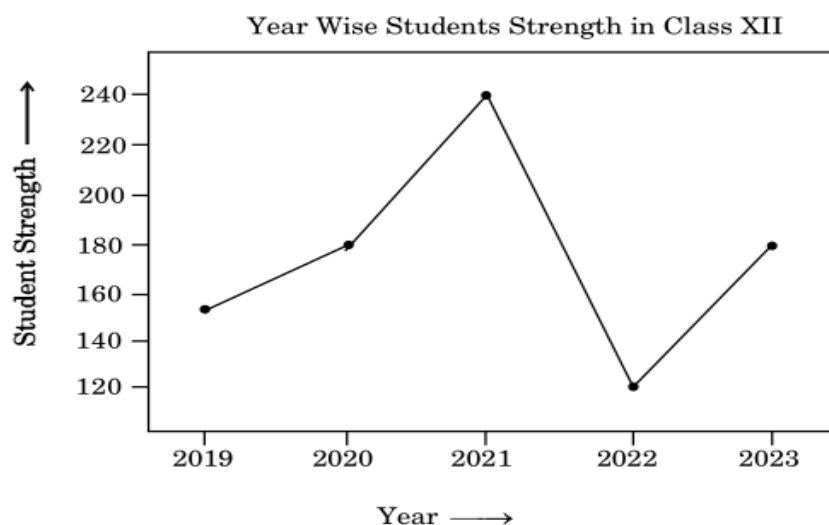
| 6            | CBSE<br>SQP<br>2025 | <p>During a practical exam, a student Ankita has to fill in the blanks in a Python Marks program that generates a bar chart. This bar chart represents the number of books read by four students in one month.</p> <table><tr><th>Student Name</th><th>Books Read</th></tr><tr><td>Karan</td><td>12</td></tr><tr><td>Lina</td><td>9</td></tr><tr><td>Raj</td><td>5</td></tr><tr><td>Simran</td><td>3</td></tr></table> <p>Help Ankita to complete the code.</p> <p style="text-align: center;">Number of Books Read by Students</p>  <pre>import _____ as plt 1 students = ['Karan', 'Lina', 'Raj', 'Simran'] books_read = [12, 9, 5, 3] plt.bar( students, _____, label='Books Read')</pre> <p>#Statement-1</p> <p>#Statement-</p> | Student Name | Books Read | Karan | 12 | Lina | 9 | Raj | 5 | Simran | 3 |
|--------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------|-------|----|------|---|-----|---|--------|---|
| Student Name | Books Read          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |            |       |    |      |   |     |   |        |   |
| Karan        | 12                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |            |       |    |      |   |     |   |        |   |
| Lina         | 9                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |            |       |    |      |   |     |   |        |   |
| Raj          | 5                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |            |       |    |      |   |     |   |        |   |
| Simran       | 3                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |            |       |    |      |   |     |   |        |   |

|   |                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                      | <pre> 2 plt.xlabel('Student Name') plt._____('Books Read') 3 plt.legend() plt.title('____') 4 plt.show() </pre> <p>#Statement-1</p> <p>#Statement-2</p> <p>I. Write the suitable code for the import statement in the blank space in the line marked as Statement-1.</p> <p>II. Refer to the graph shown above and fill in the blank in Statement-2 with suitable Python code.</p> <p>III. Fill in the blank in Statement-3 with the name of the function to set the label on the y-axis.</p> <p>IV. Refer the graph shown above and fill the blank in Statement-4 with suitable Chart Title.</p> |
| 7 | CBSE<br>Main<br>2024 | <p>The inventory management software of a grocery shop stores the price of all fruits as follows:</p> <pre> Fruits=['Apple','Guava','Papaya','Grapes','Mango'] Price=[150,70,50,30,120] </pre> <p>Write suitable Python code to generate a Bar Chart on the given data. Also add the chart title and label for the X and Y axis. Also add a suitable statement to save this chart with the name fruits.png.</p>                                                                                                                                                                                   |
| 8 | CBSE<br>Main<br>2024 | <p>Write suitable Python code to draw the following line chart <b>“CO2 Emission”</b> having title and label for X and Y axis as shown below.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |



Also give a suitable Python statement to save this chart with the name, **emission.png**.

|      |                       |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |      |     |      |     |      |     |      |     |      |     |
|------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------|------|-----|------|-----|------|-----|------|-----|------|-----|
| 9    | CBSE<br>Compt<br>2024 | <p>Akriti keeps the calorie count of different food items as follows :</p> <p>Food = ['Apple','Banana','Rice','Wheat','Carrot']<br/>Calorie = [72,105,204,455,52]</p> <p>Write a Python code to generate a Bar Chart on the given data, having suitable Chart Title and labels for X and Y axis. Also add suitable statement to save this chart with the name calorie.png.</p>                      |      |                  |      |     |      |     |      |     |      |     |      |     |
| 10   | CBSE<br>Compt<br>2024 | <p>Consider the following data :</p> <table><tr><td>Year</td><td>Student Strength</td></tr><tr><td>2019</td><td>150</td></tr><tr><td>2020</td><td>180</td></tr><tr><td>2021</td><td>240</td></tr><tr><td>2022</td><td>120</td></tr><tr><td>2023</td><td>180</td></tr></table> <p>Write a Python code to draw the following line chart having title and labels for x and y axis as shown below :</p> | Year | Student Strength | 2019 | 150 | 2020 | 180 | 2021 | 240 | 2022 | 120 | 2023 | 180 |
| Year | Student Strength      |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |      |     |      |     |      |     |      |     |      |     |
| 2019 | 150                   |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |      |     |      |     |      |     |      |     |      |     |
| 2020 | 180                   |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |      |     |      |     |      |     |      |     |      |     |
| 2021 | 240                   |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |      |     |      |     |      |     |      |     |      |     |
| 2022 | 120                   |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |      |     |      |     |      |     |      |     |      |     |
| 2023 | 180                   |                                                                                                                                                                                                                                                                                                                                                                                                     |      |                  |      |     |      |     |      |     |      |     |      |     |



Also give suitable Python statement to save this chart with name, stud.png.

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SQP  
2024

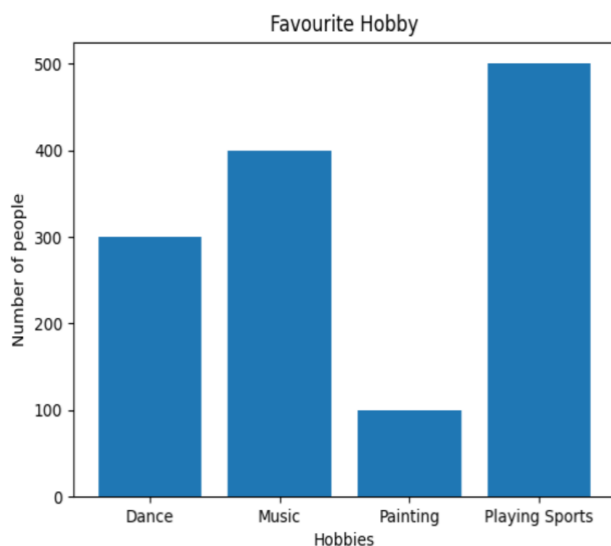
The heights of 10 students of eighth grade are given below:

Height\_cms=[145,141,142,142,143,144,141,140,143,144]

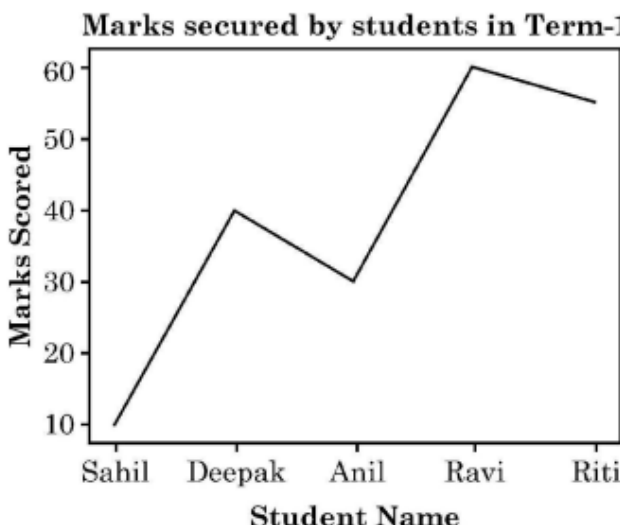
Write suitable Python code to generate a histogram based on the given data, along with an appropriate chart title and both axis labels. Also give suitable python statement to save this chart.

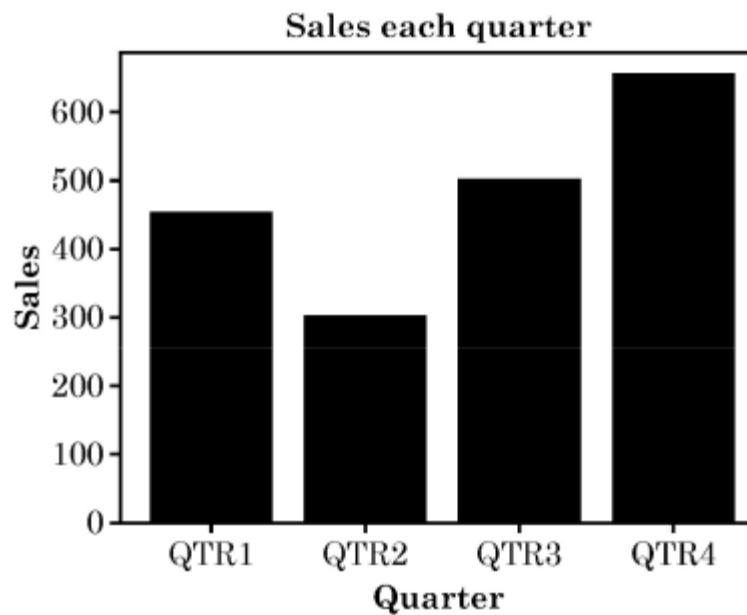
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SQP  
2024

Write suitable Python code to create 'Favourite Hobby' Bar Chart as shown below:



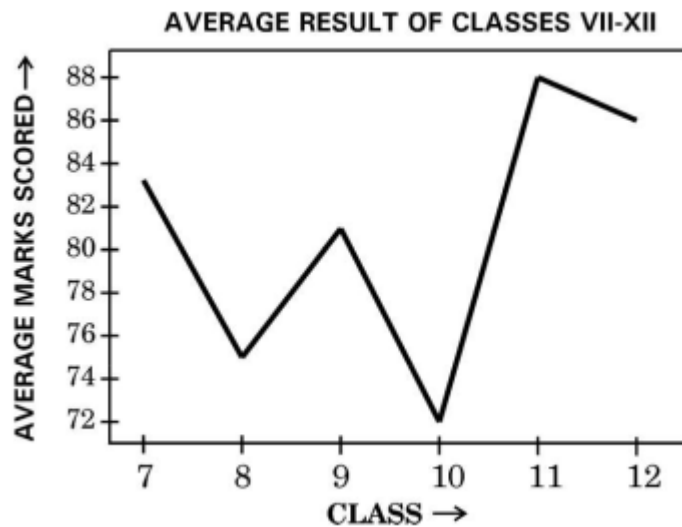
Also give suitable python statement to save this chart.

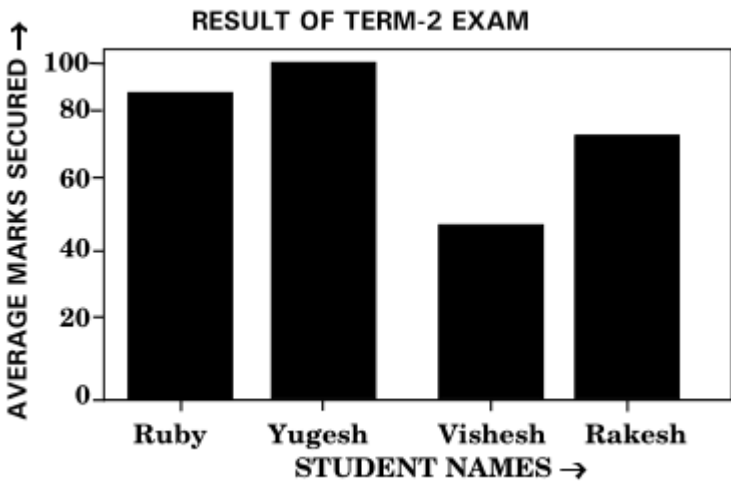
| 13           | CBSE<br>Main<br>2023 | <p>Consider the following graph. Write the Python code to plot it. Also add the Title, label for X and Y axis. Use the following data for plotting the graph</p> <pre>smarks=[10,40,30,60,55] sname=["Sahil", "Deepak", "Anil", "Ravi","Riti"]</pre>  <table><caption>Marks secured by students in Term-1</caption><tr><th>Student Name</th><th>Marks Scored</th></tr><tr><td>Sahil</td><td>10</td></tr><tr><td>Deepak</td><td>40</td></tr><tr><td>Anil</td><td>30</td></tr><tr><td>Ravi</td><td>60</td></tr><tr><td>Riti</td><td>55</td></tr></table> | Student Name | Marks Scored | Sahil | 10 | Deepak | 40 | Anil | 30 | Ravi | 60 | Riti | 55 |
|--------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|-------|----|--------|----|------|----|------|----|------|----|
| Student Name | Marks Scored         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |              |       |    |        |    |      |    |      |    |      |    |
| Sahil        | 10                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |              |       |    |        |    |      |    |      |    |      |    |
| Deepak       | 40                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |              |       |    |        |    |      |    |      |    |      |    |
| Anil         | 30                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |              |       |    |        |    |      |    |      |    |      |    |
| Ravi         | 60                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |              |       |    |        |    |      |    |      |    |      |    |
| Riti         | 55                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |              |       |    |        |    |      |    |      |    |      |    |
| 14           | CBSE<br>Main<br>2023 | <p>Write Python code to draw the following bar graph representing the total sales in each quarter. Add the Title, Label for X-axis and Y-axis. Use the following data for plotting the graph :</p> <pre>sales=[450,300,500,650] qtr=["QTR1", "QTR2", "QTR3", "QTRA"]</pre>                                                                                                                                                                                                                                                                                                                                                                |              |              |       |    |        |    |      |    |      |    |      |    |

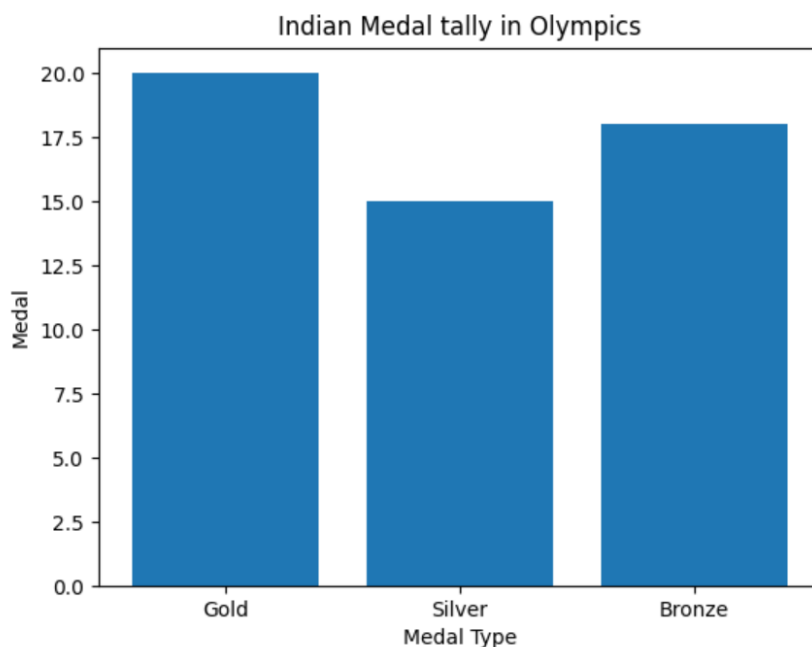


15 CBSE Compt 2023 Consider the following graph. Write the Python code to plot it. Also add the Title and Label for X and Y axis. Use the following data to draw the graph.

| Class | Marks |
|-------|-------|
| 7     | 83    |
| 8     | 75    |
| 9     | 81    |
| 10    | 72    |
| 11    | 88    |
| 12    | 86    |



|         |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |      |    |        |    |         |    |        |    |
|---------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|------|----|--------|----|---------|----|--------|----|
| 16      | CBSE<br>Compt<br>2023 | <p>Write a Python code to draw the following bar graph representing the average marks secured by each student in Term-2 Exam. Add the Title and Label for X-axis and Y-axis. Use the following data to draw the graph :</p> <table><tr><td>Names</td><td>Average Marks</td></tr><tr><td>Ruby</td><td>84</td></tr><tr><td>Yugesh</td><td>92</td></tr><tr><td>Vishesh</td><td>45</td></tr><tr><td>Rakesh</td><td>72</td></tr></table>  | Names | Average Marks | Ruby | 84 | Yugesh | 92 | Vishesh | 45 | Rakesh | 72 |
| Names   | Average Marks         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |      |    |        |    |         |    |        |    |
| Ruby    | 84                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |      |    |        |    |         |    |        |    |
| Yugesh  | 92                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |      |    |        |    |         |    |        |    |
| Vishesh | 45                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |      |    |        |    |         |    |        |    |
| Rakesh  | 72                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |               |      |    |        |    |         |    |        |    |
| 17      | CBSE<br>SQP<br>2023   | <p>Write Python code to plot a bar chart for India's medal tally as shown below:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |               |      |    |        |    |         |    |        |    |



Also give suitable python statement to save this chart.

|    |               |                                                                                                                                                                                                             |
|----|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18 | CBSE SQP 2023 | <p>Write a python program to plot a line chart based on the given data to depict the changing weekly average temperature in Delhi for four weeks.</p> <p>Week=[1,2,3,4]<br/>Avg_week_temp=[40,42,38,44]</p> |
|----|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Section - B (4 - Mark Questions - Answers)

|   |                                                                                                                                                                                           |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <p>I. hist<br/>II. plt<br/>III. legend()<br/>IV. plt.show()</p>                                                                                                                           |
| 2 | <p>(i) 'Pen', 'Book', 'Pencil', 'Eraser', 'Scale'<br/>(ii) Products<br/>(iii) title<br/>(iv) savefig</p>                                                                                  |
| 3 | <p>I. import matplotlib.pyplot<br/>II. plt.plot(Months, Revenue, label='Revenue (in Lacs)')<br/>III. plt.title('Monthly Revenue Analysis')<br/>IV. plt.savefig('monthly_revenue.png')</p> |

|   |                                                                                                                                                                                                                                                                                                      |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | (i) matplotlib.pyplot<br>(ii) plot<br>(iii) 'Days'<br>(iv) 'Temperature Over 5 Days'                                                                                                                                                                                                                 |
| 5 | (i) matplotlib.pyplot<br>(ii) months, sales<br>(iii) 'Monthly Sales Analysis'<br>(iv) 'Sales'                                                                                                                                                                                                        |
| 6 | I. matplotlib.pyplot<br>II. books_read<br>III. ylabel<br>IV. 'Number of Books Read by Students'                                                                                                                                                                                                      |
| 7 | import matplotlib.pyplot as plt<br>Fruits = ['Apple', 'Guava', 'Papaya', 'Grapes', 'Mango']<br>Price = [150, 70, 50, 30, 120]<br>plt.bar(Fruits, Price)<br>plt.title('Fruit Prices')<br>plt.xlabel('Fruits')<br>plt.ylabel('Price')<br>plt.savefig('fruits.png')<br>plt.show()                       |
| 8 | import matplotlib.pyplot as plt<br>Month = ['April', 'May', 'June', 'July', 'August']<br>Percentage = [40, 50, 30, 60, 20]<br>plt.plot(Month, Percentage)<br>plt.title('Month wise CO2 emission')<br>plt.xlabel('Month')<br>plt.ylabel('Percentage')<br>plt.savefig('emission.png')<br>plt.show()    |
| 9 | import matplotlib.pyplot as plt<br>Food = ['Apple', 'Banana', 'Rice', 'Wheat', 'Carrot']<br>Calorie = [72, 105, 204, 455, 52]<br>plt.bar(Food, Calorie)<br>plt.title('Calorie Count of Food Items')<br>plt.xlabel('Food Items')<br>plt.ylabel('Calorie')<br>plt.savefig('calorie.png')<br>plt.show() |

|    |                                                                                                                                                                                                                                                                                                                                  |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10 | <pre> import matplotlib.pyplot as plt Year = ['2019', '2020', '2021', '2022', '2023'] Strength = [150, 180, 240, 120, 180] plt.plot(Year, Strength, marker='o', color='black') plt.title('Year Wise Students Strength in Class XII') plt.xlabel('Year') plt.ylabel('Student Strength') plt.savefig('stud.png') plt.show() </pre> |
| 11 | <pre> import matplotlib.pyplot as plt Height_cms = [145,141,142,142,143,144,141,140,143,144] plt.hist(Height_cms, edgecolor='black') plt.title('Height Distribution of Students') plt.xlabel('Height (in cm)') plt.ylabel('Number of Students') plt.savefig('height.png') plt.show() </pre>                                      |
| 12 | <pre> import matplotlib.pyplot as plt Hobbies = ['Dance', 'Music', 'Painting', 'Playing Sports'] People = [300, 400, 100, 500] plt.bar(Hobbies, People) plt.title('Favourite Hobby') plt.xlabel('Hobbies') plt.ylabel('Number of people') plt.savefig('hobby.png') plt.show() </pre>                                             |
| 13 | <pre> import matplotlib.pyplot as plt smarks = [10, 40, 30, 60, 55] sname = ['Sahil', 'Deepak', 'Anil', 'Ravi', 'Riti'] plt.plot(sname, smarks) plt.title('Marks secured by students in Term-1') plt.xlabel('Student Name') plt.ylabel('Marks Scored') plt.show() </pre>                                                         |
| 14 | <pre> import matplotlib.pyplot as plt sales = [450, 300, 500, 650] qtr = ['QTR1', 'QTR2', 'QTR3', 'QTR4'] plt.bar(qtr, sales, color='black') plt.title('Sales each quarter') plt.xlabel('Quarter') </pre>                                                                                                                        |

|    |                                                                                                                                                                                                                                                                                        |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <pre>plt.ylabel('Sales') plt.show()</pre>                                                                                                                                                                                                                                              |
| 15 | <pre>import matplotlib.pyplot as plt Class = [7, 8, 9, 10, 11, 12] Marks = [83, 75, 81, 72, 88, 86] plt.plot(Class, Marks, color='black', linewidth=2) plt.title('AVERAGE RESULT OF CLASSES VII-XII') plt.xlabel('CLASS') plt.ylabel('AVERAGE MARKS SCORED') plt.show()</pre>          |
| 16 | <pre>import matplotlib.pyplot as plt Names = ['Ruby', 'Yugesh', 'Vishesh', 'Rakesh'] Average_Marks = [84, 92, 45, 72] plt.bar(Names, Average_Marks, color='black') plt.title('RESULT OF TERM-2 EXAM') plt.xlabel('STUDENT NAMES') plt.ylabel('AVERAGE MARKS SECURED') plt.show()</pre> |
| 17 | <pre>import matplotlib.pyplot as plt Medal_Type = ['Gold', 'Silver', 'Bronze'] Medal_Count = [20, 15, 18] plt.bar(Medal_Type, Medal_Count) plt.title("Indian Medal tally in Olympics") plt.xlabel('Medal Type') plt.ylabel('Medal') plt.savefig('medal_tally.png') plt.show()</pre>    |
| 18 | <pre>import matplotlib.pyplot as plt Week = [1, 2, 3, 4] Avg_week_temp = [40, 42, 38, 44] plt.plot(Week, Avg_week_temp) plt.title('Weekly Average Temperature in Delhi') plt.xlabel('Week') plt.ylabel('Average Temperature') plt.show()</pre>                                         |

## Topic: Database Query using SQL

### Question Type: MCQ (Multiple Choice Questions/Fill in the Blank)-1

| Q.N. | Questions                                                                                                                                    | Marks |
|------|----------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1   | MySQL is a<br>(a) RDBMS (b) OSS (c) Device Driver (d) Server OS                                                                              | 1     |
| Q2   | To store fractional value in a column the data type of the column must be –<br>(a) Float or Double (b) integer or bigint (c) Varchar (d) Bit | 1     |
| Q3   | To store Name of Students, What will be the required datatype.<br>(a) Integer (b) Varchar (c) Date (d) Char                                  | 1     |
| Q4   | The correct format of Date in MySQL is<br>(a) DD-MM-YY (b) DD-MM-YYYY (c) YYYY-MM-DD (d) MM-DD-YYYY                                          | 1     |
| Q5   | The correct format of Time in MySQL is<br>(a) HH:MM:SS (b) SS:MM:HH (c) HH:MM (d) HH:SS:MM                                                   | 1     |
| Q6   | A table can have _____ primary key(s)<br>(a) One (b) Two (c) Three (d) Any Number of                                                         | 2     |
| Q7   | DDL Stands for –<br>(a) Data Definition Language (b) Database Definition Language<br>(c) Database Data Language (d) Data Describe Language   | 2     |
| Q8   | A database is technically a collection of _____<br>(a) Data (b) tables (c) files (d) functions                                               | 2     |
| Q9   | The create command is used to create –<br>(a) Database (b) Tables (c) both database & tables (d) Nothing                                     | 2     |
| Q10  | To add records to a table, _____ command is used<br>(a) insert (b) add (c) select (d) input                                                  | 3     |

### Answers:

|     |     |     |     |     |         |          |     |          |     |
|-----|-----|-----|-----|-----|---------|----------|-----|----------|-----|
| Q1  | Q2  | Q3  | Q4  | Q5  | Q6      | Q7       | Q8  | Q9       | Q10 |
| (a) | (a) | (b) | (c) | (a) | (a) One | (a) Data | (b) | (c) both | (a) |

|       |                    |         |                |          |  |                        |        |                      |        |
|-------|--------------------|---------|----------------|----------|--|------------------------|--------|----------------------|--------|
| RDBMS | Float or<br>Double | Varchar | YYYY-<br>MM-DD | HH:MM:SS |  | Definition<br>Language | tables | database<br>& tables | insert |
|-------|--------------------|---------|----------------|----------|--|------------------------|--------|----------------------|--------|

**Question Type: MCQ (Multiple Choice Questions/Fill in the Blank)-2**

| QN | Questions                                                                                                                                                                                                                 | Marks |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1 | Select year('2025-09-12') will return<br>(a) 25            (b) 2025            (c) 12            (d) 2012                                                                                                                 | 1     |
| Q2 | To remove leading and trailing spaces from a string the function used is –<br>(a) ltrim()            (b) rtrim()            (c) trimboth()            (d) trim()                                                          | 1     |
| Q3 | Select power(2,5) will return<br>(a) 25            (b) 10            (c) 32            (d) 52                                                                                                                             | 1     |
| Q4 | What will be the output of the following SQL statement?<br>SELECT MOD(25,4);<br>(a) 5            (b) 6            (c) 1            (d) 0                                                                                  | 1     |
| Q5 | Select monthname('2025-09-10'); will return<br>(a) 09            (b) sep            (c) september            (d) october                                                                                                  | 1     |
| Q6 | The dayname() function requires a _____ and returns the _____<br>(a) integer value , day No            (b) integer value ,day name<br>(c) date , day no.            (d) date , day name                                   | 2     |
| Q7 | The now() function returns the –<br>(a) date only            (b) time only<br>(c) date and time in timestamp format            (d) date and day                                                                           | 2     |
| Q8 | Which of the following is not an integer type –<br>(a) smallint            (b) mediumint<br>(c) bigint            (d) clob                                                                                                | 2     |
| Q9 | To solve the arithmetic expression $\sqrt{2} + \sqrt{3}$ the correct SQL query would be –<br>(a) select sqrt(2+3) ;            (b) select sqrt(2,3);<br>(c) select sqrt(2) + sqrt(3) ;            (d) sqrt(2) + sqrt(3) ; | 2     |

|     |                                                                                                                                 |                      |   |
|-----|---------------------------------------------------------------------------------------------------------------------------------|----------------------|---|
| Q10 | DAYOFYEAR() is a built-in function that returns the day of the year for a given date, as a number from<br>(a) 1-12<br>(c) 1-366 | (b) 1-365<br>(d) 1-7 | 3 |
|-----|---------------------------------------------------------------------------------------------------------------------------------|----------------------|---|

**Answers:**

|          |            |        |       |               |                    |                                       |          |                                |          |
|----------|------------|--------|-------|---------------|--------------------|---------------------------------------|----------|--------------------------------|----------|
| Q1       | Q2         | Q3     | Q4    | Q5            | Q6                 | Q7                                    | Q8       | Q9                             | Q10      |
| (b) 2025 | (d) trim() | (c) 32 | (c) 1 | (c) september | (d) date ,day name | (c) date and time in timestamp format | (d) clob | (c) select sqrt(2) + sqrt(3) ; | (c)1-366 |

**Question Type: MCQ (Multiple Choice Questions/Fill in the Blank)-3**

| QN | Questions                                                                                                                                                                    | Marks |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1 | Arranging rows of a MySQL table either in ascending or descending form is done by –<br>(a) group by clause (b) order by clause (c) having clause (d) sort by clause          | 1     |
| Q2 | The default sorting order in MySQL is –<br>(a) ascending (b) descending (c) no default order (d) according to size                                                           | 1     |
| Q3 | In a MySQL query the <b>order by</b> clause would be positioned at the –<br>(a) first place (b) last place<br>(c) between group by and having (d) between where and group by | 1     |
| Q4 | To group rows and perform operations on grouped data which of the following is used –<br>(a) group by clause (b) order by clause (c) where clause (d) having clause          | 1     |
| Q5 | To filter groups created by group by clause which of the following clause is used –<br>(a) where clause (b) having clause (c) order by clause (d) None of these              | 1     |
| Q6 | The <b>having</b> clause is always used with <b>group by</b> clause - (True / False)                                                                                         | 2     |
| Q7 | We can filter rows using <b>where</b> clause before they are grouped using group by.                                                                                         | 2     |

|     |                                                                                                                                                                                                                                                  |   |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (True/False)                                                                                                                                                                                                                                     |   |
| Q8  | We can create nested groups using two or more levels of grouping. (True/False)                                                                                                                                                                   | 2 |
| Q9  | The correct order of where , having , order by and group by is –<br>(a) where , group by , having , order by<br>(b) where, having, group by , order by<br>(c) having , group by , order by, where<br>(d) All of these cannot be used in a query. | 2 |
| Q10 | Which keyword is used for sorting the data in descending order in Mysql?<br>a) DESC      b) ASC      c) ALTER      d) MODIFY                                                                                                                     | 3 |

### Answers:

|                           |                  |                   |                              |                         |      |      |      |     |         |
|---------------------------|------------------|-------------------|------------------------------|-------------------------|------|------|------|-----|---------|
| Q1                        | Q2               | Q3                | Q4                           | Q5                      | Q6   | Q7   | Q8   | Q9  | Q10     |
| (b)<br>order by<br>clause | (a)<br>ascending | (b) last<br>place | (a)<br>group<br>by<br>clause | (b)<br>having<br>clause | True | True | True | (a) | a) DESC |

### Question Type: Assertion – Reason Type Questions

| QN | QUESTIONS                                                                                                                                                                                                                                                                                                                                                                  | MARKS |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1  | Assertion(A) : Alter table query can be used to add a column in a table<br>Reasoning(R) : Alter is a DML Query and is used to make changes in the table design<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True | 1     |
| 2  | Assertion (A): FLOAT and DOUBLE are data types<br>Reason (R): Both can hold any number upto 23 digits<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A                                                                                                                           | 1     |

|   |                                                                                                                                                                                                                                                                                                                                                                                   |   |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|   | iii. A is True but R is False<br>iv. A is false but R is True                                                                                                                                                                                                                                                                                                                     |   |
| 3 | Assertion (A): The HAVING clause is used with aggregate functions<br>Reason (R): WHERE clause places condition on individual rows<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True                                     | 1 |
| 4 | Assertion(A):- Sum() & Avg() are aggregate Functon<br>Reasoning (R.)- These can work on multiple function<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True                                                             | 1 |
| 5 | Assertion (A): The PRIMARY KEY constraint is given with column<br>Reasoning (R): NULL values are not allowed to be entered using the NOT NULL constraint<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True              | 1 |
| 6 | <b>Assertion (A):</b> COUNT(*) counts all rows in a table.<br><b>Reason (R):</b> COUNT(*) counts rows irrespective of whether individual columns contain NULL values.<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True | 1 |
| 7 | <b>Assertion (A):</b> HAVING can replace ORDER BY when we want to sort records.<br><b>Reason (R):</b> ORDER BY is specifically used for sorting the result.                                                                                                                                                                                                                       | 1 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                          |   |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|    | i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True                                                                                                                                                                                                 |   |
| 8  | <b>Assertion (A):</b> The output of ROUND(1434.56,-1) is 1430.<br><b>Reason (R):</b> A negative value of the second argument of ROUND() specifies rounding to the left of the decimal point.<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True | 1 |
| 9  | <b>Assertion (A):</b> If NOW() returns 2026-08-17 08:30:25, then DATE(NOW()) returns 2026-08-17.<br><b>Reason (R):</b> DATE() extracts the date part from a date-time value.<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True                 | 1 |
| 10 | <b>Assertion (A):</b> If NOW() returns 2026-08-17 08:30:25, then MONTH(NOW()) returns August.<br><b>Reason (R):</b> MONTH() extracts the month component from a date.<br>i. Both A and R are true and R is the correct explanation for A<br>ii. Both A and R are true and R is not the correct explanation for A<br>iii. A is True but R is False<br>iv. A is false but R is True                        | 1 |

### **Answers:**

|            |            |           |          |           |          |           |          |          |           |
|------------|------------|-----------|----------|-----------|----------|-----------|----------|----------|-----------|
| <b>1</b>   | <b>2</b>   | <b>3</b>  | <b>4</b> | <b>5</b>  | <b>6</b> | <b>7</b>  | <b>8</b> | <b>9</b> | <b>10</b> |
| <b>iii</b> | <b>iii</b> | <b>ii</b> | <b>i</b> | <b>ii</b> | <b>i</b> | <b>iv</b> | <b>i</b> | <b>i</b> | <b>iv</b> |

### **Question Type: Short Type Questions**

| <b>QN</b> | <b>Questions</b>                                                                                                                                                                                                                                                                                                                                                                                 | <b>Marks</b> |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Q1        | Explain the cardinality and degree of a table.                                                                                                                                                                                                                                                                                                                                                   | 2            |
| Q2        | What is the significance of NULL ? Is it same as Zero ? Explain                                                                                                                                                                                                                                                                                                                                  | 2            |
| Q3        | Differentiate between <b><i>varchar</i></b> and <b><i>char</i></b> . Which should be used when?                                                                                                                                                                                                                                                                                                  | 2            |
| Q4        | <p>Samarth writes the following commands with respect to a table <b><i>library</i></b> having fields <b><i>book_id, book_name, price, author, pages, publication</i></b> etc.</p> <p>Command1 : select count(*) from library</p> <p>Command2 : select count(author) from library.</p> <p>He gets the output 658 for first command but 653 for second. Explain the output with justification.</p> | 2            |
| Q5        | What is the use of concat() function. Explain with example.                                                                                                                                                                                                                                                                                                                                      | 2            |
| Q6        | Write SQL queries to remove leading and trailing spaces from the string ' CBSE '                                                                                                                                                                                                                                                                                                                 | 2            |
| Q7        | <p>Consider a SQL string : 'Interpreter'. Write commands to display :</p> <p>(i) Inter      (ii) preter</p>                                                                                                                                                                                                                                                                                      | 2            |
| Q8        | What is the purpose of aggregate functions, and how do they differ from scalar functions?                                                                                                                                                                                                                                                                                                        | 2            |
| Q9        | <p>Predict the output of the following queries:</p> <p>i)      SELECT SUBSTR('INDIA IS BEST', -4 ,3)</p> <p>ii)     SELECT CONCAT('WELCOME' , RIGHT("NEHA SINGH", 5));</p>                                                                                                                                                                                                                       |              |
| Q10       | <p>Consider the same string 'Examination' Write SQL commands to display:</p> <p>i. The position of the substring 'min' in the string 'Examination'</p> <p>ii.    The last 5 letters of the string</p>                                                                                                                                                                                            |              |

### **Answers:**

| QN | Answers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Marks |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1  | Cardinality refers to the number of rows in the table while degree refers to the number of columns.                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2     |
| 2  | Null is a specifier. NULL represents the <b>absence of a value</b> or <b>unknown value</b> in a table column. Zero is not same as NULL. Zero is a valid integer value. NULL has no datatype while Zero in integer type. Zero is compared with = operator. Null cannot be compared against any value using = operator.                                                                                                                                                                                                                                  | 2     |
| 3  | Varchar and char both data types are used to store strings/text. varchar is used to store variable length strings such as name, city etc. char data type is used to store fixed-length strings such as PAN No ,Aadhar No , Mobile No. etc. In terms of storage, char will fill the remaining bytes with spaces if the length of actual string is less than the size of char. Varchar does not fill the remaining bytes with spaces and thus saves bytes on storage.                                                                                    | 2     |
| 4  | This is because in the first case the count() functions returns the total number of rows/records in the table. In second case the count() function counts the valid values in the author column of the library table. This column contains 03 NULL values. Which are ignored by the count() function.                                                                                                                                                                                                                                                  | 2     |
| 5  | Concat() function is used either to join two or more strings (text) or to join two or more columns of a table containing string(tex).<br>Example – Select concat('super','sonic');<br>Output: supersonic                                                                                                                                                                                                                                                                                                                                               | 2     |
| 6  | SELECT LTRIM(' CBSE '); removes leading spaces.<br>SELECT RTRIM(' CBSE '); removes trailing spaces.<br>SELECT TRIM(' CBSE '); To remove both:                                                                                                                                                                                                                                                                                                                                                                                                          | 2     |
| 7  | (i) Select left('Interpreter',5) ;                      (ii) Select right('Interpreter',6) ;                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2     |
| 8  | <b>Aggregate functions</b> , operate on a set of rows and return a single summary value for that set (e.g., SUM of salaries, COUNT of employees). They are typically used with GROUP BY clauses to perform calculations on groups of data. Ex – sum() ,avg(), count() etc.<br><b>Scalar functions</b> , on the other hand, operate on a single value and return a single value for each row processed (e.g., UPPER() / LOWER () converts a string to uppercase/lowercase for each individual string). They do not summarize data across multiple rows. | 2     |

|    |                                                                                                                               |  |
|----|-------------------------------------------------------------------------------------------------------------------------------|--|
| 9  | i) BES<br>ii) WELCOME SINGH                                                                                                   |  |
| 10 | i. select instr("Examination","min");<br>OR<br>select position("min" in "Examination");<br>ii. select right("Examination",5); |  |

### Question Type: Long Type Questions

| QN                      | Questions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Marks    |       |          |            |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|----------|------------|------------------|-------|-----|----------|-------------------|-------|----------|------------|-------------------------|--------|--------|------|-------------------|------------|-----|-----------|-------------------|-------|----------|------------|-------------------|-------|-------|-------|-------------------|----|----|-------|---|
| Q1                      | <div>Observe the following printers table carefully -</div> <table><tr><td>Pname</td><td>make</td><td>features</td><td>Price</td></tr><tr><td>HP Laserjet 1020</td><td>HP</td><td>BW</td><td>13500</td></tr><tr><td>Epson Inkjet L360</td><td>Epson</td><td>Color</td><td>11000</td></tr><tr><td>Canon Lasershot LBP 290</td><td>Canon</td><td>BW</td><td>8100</td></tr><tr><td>HP Laserjet P1008</td><td>HP</td><td>BW</td><td>7200</td></tr><tr><td>Epson Inkjet L365</td><td>Epson</td><td>Color</td><td>13000</td></tr><tr><td>Canon Pixma G1000</td><td>Canon</td><td>Color</td><td>69000</td></tr><tr><td>HP Laserjet P1566</td><td>HP</td><td>BW</td><td>12000</td></tr></table> <div>(i) To display the details of those printers whose price falls in the range 6000 to 11000<br/>(ii) To add a new column ability that will take values like ‘WiFi’, ‘Ethernet’ ‘ Cloud Computing’ etc.<br/>(iii) Command to show the minimum and maximum cost of HP Printers<br/>(iv) To delete the records of Canon Printers<br/>(v) To remove the table printers along with all records.</div> | Pname    | make  | features | Price      | HP Laserjet 1020 | HP    | BW  | 13500    | Epson Inkjet L360 | Epson | Color    | 11000      | Canon Lasershot LBP 290 | Canon  | BW     | 8100 | HP Laserjet P1008 | HP         | BW  | 7200      | Epson Inkjet L365 | Epson | Color    | 13000      | Canon Pixma G1000 | Canon | Color | 69000 | HP Laserjet P1566 | HP | BW | 12000 | 5 |
| Pname                   | make                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | features | Price |          |            |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| HP Laserjet 1020        | HP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BW       | 13500 |          |            |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| Epson Inkjet L360       | Epson                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Color    | 11000 |          |            |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| Canon Lasershot LBP 290 | Canon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | BW       | 8100  |          |            |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| HP Laserjet P1008       | HP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BW       | 7200  |          |            |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| Epson Inkjet L365       | Epson                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Color    | 13000 |          |            |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| Canon Pixma G1000       | Canon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Color    | 69000 |          |            |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| HP Laserjet P1566       | HP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BW       | 12000 |          |            |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| Q2                      | <div>Observe the following <i>teachers</i> table –</div> <div><i>teachers</i></div> <table><tr><th>Empcode</th><th>post</th><th>gender</th><th>dept</th><th>salary</th><th>panno</th></tr><tr><td>101</td><td>Lecturer</td><td>male</td><td>IT</td><td>15000.00</td><td>ABCPD1234F</td></tr><tr><td>102</td><td>Reader</td><td>female</td><td>FA</td><td>25000.00</td><td>FGHPL5678K</td></tr><tr><td>103</td><td>Professor</td><td>male</td><td>HM</td><td>35000.00</td><td>JKLMR2345P</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Empcode  | post  | gender   | dept       | salary           | panno | 101 | Lecturer | male              | IT    | 15000.00 | ABCPD1234F | 102                     | Reader | female | FA   | 25000.00          | FGHPL5678K | 103 | Professor | male              | HM    | 35000.00 | JKLMR2345P | 5                 |       |       |       |                   |    |    |       |   |
| Empcode                 | post                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | gender   | dept  | salary   | panno      |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| 101                     | Lecturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | male     | IT    | 15000.00 | ABCPD1234F |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| 102                     | Reader                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | female   | FA    | 25000.00 | FGHPL5678K |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |
| 103                     | Professor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | male     | HM    | 35000.00 | JKLMR2345P |                  |       |     |          |                   |       |          |            |                         |        |        |      |                   |            |     |           |                   |       |          |            |                   |       |       |       |                   |    |    |       |   |

|     |           |        |     |          |            |
|-----|-----------|--------|-----|----------|------------|
| 104 | Lecturer  | male   | IT  | 20000.0  | QRSTC6789N |
| 105 | Reader    | female | HM  | 27000.0  | MNOPD3456L |
| 106 | Professor | female | FA  | 36000.00 | ZXCVP7890A |
| 107 | Lecturer  | female | FA  | 40000.00 | LKJHQ4321M |
| 108 | Reader    | male   | IT  | 38000.00 | WERTR5678Z |
| 109 | Professor | male   | LAW | 48000.00 | BNMCD8765X |

Write the SQL Commands to -

- write the create table query for the given table using suitable datatypes and constraints ,assume that empcode is primary key, default post is lecturer, gender must be either male or female, panno must be given and non duplicate.
- add a row to the **teachers** table with the following data -  
empcode = 110, post = 'Professor' gender = 'male' dept = 'Basic Science',  
salary = 65000.00
- Write the SQL query to remove the column **dept** from the above table.
- Write the SQL query to display records of all male teachers of IT department.
- Write the SQL query to increase the salary of all female teachers by 2%.
- select all records where panno contains 34 at any place.

- Q3 Write the SQL functions (command) which will perform the following operations -
- To divide the number 20 by 3 and obtain the remainder.
  - To find the position of the occurrence of the word 'date' in the word 'candidate'
  - To display the current date.
  - To truncate the value 256.357 to 2 decimal places.
  - To display the current date and time.

- Q4 Consider the table GAMES given below:

| Gcode | Games_Name   | Type    | Number | Prize_Money | Schedule_Date |
|-------|--------------|---------|--------|-------------|---------------|
| 101   | Carrom Board | Indoor  | 2      | 5000        | 23.01.2004    |
| 102   | Badminton    | Outdoor | 2      | 12000       | 12.122003     |
| 103   | Table Tennis | Indoor  | 4      | 8000        | 14.02.2004    |
| 105   | Chess        | Indoor  | 2      | 9000        | 01.01.2004    |
| 108   | Lawn Tennis  | Outdoor | 4      | 25000       | 19.03.1994    |

Write SQL commands for the following:

- To display details of those games which are having Prize Money more than 7000;
- To display sum of Prize Money for each type of GAME.
- To display the total number of games available in the above table GAMES.

| Q5    | <div>Satyam, a database analyst has created the following table:</div> <table><tr><th>RegNo</th><th>SName</th><th>Stream</th><th>Optional</th><th>Marks</th></tr><tr><td>S1001</td><td>Akshat</td><td>Science</td><td>CS</td><td>99</td></tr><tr><td>S1002</td><td>Harshit</td><td>Commerce</td><td>IP</td><td>95</td></tr><tr><td>S1003</td><td>Devika</td><td>Humanities</td><td>IP</td><td>100</td></tr><tr><td>S1004</td><td>Manreen</td><td>Commerce</td><td>IP</td><td>98</td></tr><tr><td>S1005</td><td>Gaurave</td><td>Humanities</td><td>IP</td><td>82</td></tr><tr><td>S1006</td><td>Saurave</td><td>Science</td><td>CS</td><td>NULL</td></tr><tr><td>S1007</td><td>Bhaskar</td><td>Science</td><td>CS</td><td>95</td></tr><tr><td>S1007</td><td>Bhaskar</td><td>Science</td><td>CS</td><td>96</td></tr></table> <div>He has written following queries:</div> <div><div>i. select sum (Marks) from student where Optional= 'IP' and STREAM= 'Commerce';</div><div>ii. select max (Marks) + min (Marks) from student where Optional = 'CS';</div><div>iii. select avg (Marks) from student where Optional = 'IP';</div><div>iv. select length (SName) from student where Marks is NULL;</div></div> <div>Help him in predicting the output of the above given queries</div> | RegNo      | SName    | Stream     | Optional | Marks | S1001 | Akshat | Science | CS      | 99         | S1002 | Harshit | Commerce | IP      | 95         | S1003 | Devika | Humanities | IP      | 100 | S1004 | Manreen | Commerce | IP     | 98   | S1005 | Gaurave | Humanities | IP      | 82 | S1006 | Saurave | Science | CS      | NULL | S1007 | Bhaskar | Science | CS | 95 | S1007 | Bhaskar | Science | CS | 96 | 4 |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|------------|----------|-------|-------|--------|---------|---------|------------|-------|---------|----------|---------|------------|-------|--------|------------|---------|-----|-------|---------|----------|--------|------|-------|---------|------------|---------|----|-------|---------|---------|---------|------|-------|---------|---------|----|----|-------|---------|---------|----|----|---|
| RegNo | SName                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Stream     | Optional | Marks      |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| S1001 | Akshat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Science    | CS       | 99         |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| S1002 | Harshit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Commerce   | IP       | 95         |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| S1003 | Devika                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Humanities | IP       | 100        |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| S1004 | Manreen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Commerce   | IP       | 98         |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| S1005 | Gaurave                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Humanities | IP       | 82         |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| S1006 | Saurave                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Science    | CS       | NULL       |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| S1007 | Bhaskar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Science    | CS       | 95         |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| S1007 | Bhaskar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Science    | CS       | 96         |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| Q6    | <div>Consider the relation VEHICLE given below and write the queries for the following questions:</div> <table><tr><th>VNO</th><th>TYPE</th><th>COMPANY</th><th>PRICE</th><th>QTY</th></tr><tr><td>WB101</td><td>Sedan</td><td>Maruti</td><td>1200000</td><td>2</td></tr><tr><td>JH134</td><td>Sumo</td><td>Tata</td><td>1000000</td><td>8</td></tr><tr><td>MH782</td><td>SUV</td><td>Maruti</td><td>1500000</td><td>5</td></tr><tr><td>BH451</td><td>Van</td><td>Tata</td><td>900000</td><td>NULL</td></tr><tr><td>MH562</td><td>Jeep</td><td>Mahindra</td><td>2500000</td><td>12</td></tr><tr><td>WB726</td><td>Sedan</td><td>Toyota</td><td>1500000</td><td>4</td></tr></table> <div><div>i. To display the cardinality of the table vehicle</div><div>ii. To find the average quantity from the table vehicle</div><div>iii. To find the aggregate price from the table vehicle whose quantity is greater than 5.</div><div>iv. To find the minimum quantity from the table vehicle.</div></div>                                                                                                                                                                                                                                                                                 | VNO        | TYPE     | COMPANY    | PRICE    | QTY   | WB101 | Sedan  | Maruti  | 1200000 | 2          | JH134 | Sumo    | Tata     | 1000000 | 8          | MH782 | SUV    | Maruti     | 1500000 | 5   | BH451 | Van     | Tata     | 900000 | NULL | MH562 | Jeep    | Mahindra   | 2500000 | 12 | WB726 | Sedan   | Toyota  | 1500000 | 4    | 4     |         |         |    |    |       |         |         |    |    |   |
| VNO   | TYPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | COMPANY    | PRICE    | QTY        |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| WB101 | Sedan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Maruti     | 1200000  | 2          |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| JH134 | Sumo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Tata       | 1000000  | 8          |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| MH782 | SUV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Maruti     | 1500000  | 5          |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| BH451 | Van                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Tata       | 900000   | NULL       |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| MH562 | Jeep                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mahindra   | 2500000  | 12         |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| WB726 | Sedan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Toyota     | 1500000  | 4          |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| Q7    | <div>Consider the following table STUDENT, and give the output for the following questions:</div> <table><tr><th>ADMNO</th><th>SNAME</th><th>STREAM</th><th>MARKS</th><th>DOB</th></tr><tr><td>101</td><td>DISHA</td><td>SCIENCE</td><td>99</td><td>12/09/2005</td></tr><tr><td>234</td><td>MADHU</td><td>ARTS</td><td>88</td><td>23/08/2004</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ADMNO      | SNAME    | STREAM     | MARKS    | DOB   | 101   | DISHA  | SCIENCE | 99      | 12/09/2005 | 234   | MADHU   | ARTS     | 88      | 23/08/2004 |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| ADMNO | SNAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | STREAM     | MARKS    | DOB        |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| 101   | DISHA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | SCIENCE    | 99       | 12/09/2005 |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |
| 234   | MADHU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ARTS       | 88       | 23/08/2004 |          |       |       |        |         |         |            |       |         |          |         |            |       |        |            |         |     |       |         |          |        |      |       |         |            |         |    |       |         |         |         |      |       |         |         |    |    |       |         |         |    |    |   |

|     |        |          |      |            |
|-----|--------|----------|------|------------|
| 145 | BASANT | COMMERCE | 74   | 31/12/2004 |
| 137 | JUNAID | SCIENCE  | NULL | 15/10/2006 |
| 452 | MARY   | ARTS     | 74   | 07/02/2006 |

- SELECT MIN(DOB) FROM STUDENT;
- SELECT COUNT(MARKS) FROM STUDENT;
- SELECT COUNT(DISTINCT(MARKS)),SUM(MARKS) FROM STUDENT;
- SELECT AVG(MARKS) FROM STUDENT WHERE STREAM='ARTS';

Q8 Carefully observe the following table named 'stock':

4

| Pid | PName       | Category | Qty | Price |
|-----|-------------|----------|-----|-------|
| 1   | Keyboard    | IO       | 15  | 450   |
| 2   | Mouse       | IO       | 10  | 350   |
| 3   | Wifi-router | NW       | 5   | 2600  |
| 4   | Switch      | NW       | 3   | 3000  |
| 5   | Monitor     | O        | 10  | 4500  |
| 6   | Printer     | O        | 4   | 17000 |

Write SQL queries for the following:

- To display the records in decreasing order of price.
- To display category and category wise total quantities of products.
- To display the category and its average price.
- To display category and category wise highest price of the products.

Q9 Write the SQL commands which will perform the following operations on Faculty Table:

5

- To display total characters in a string field "FacultyName".
- To round the argument x that contains number 234.6789 to 3 decimal places.
- To return the last 5 characters from a string field "Lastname".
- To display day of year from your date of birth
- To display 2 characters starting from the 3<sup>rd</sup> position from the string filed "Address".

Q10 Write the SQL functions which will perform the following operations:

5

- To display the name of the month of the current date .
- To remove spaces from the beginning and end of a string, " Panorama ".
- To display the day name of the current date.
- To display the starting position of your first name(fname) from your whole name (name).
- To compute the remainder of division between two numbers, n1 and n2

**Answers:**

| Q<br>N | Answers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Mar<br>ks |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1      | (i) select * from printers where price between 6000 and 11000;<br>(ii) alter table printers add column ability varchar(10);<br>(iii) select min(price),max(price) from printers where make = 'HP';<br>(iv) delete from printers where make ='Canon';<br>(v) drop table printers;                                                                                                                                                                                                                                                                                                                                                 | 5         |
| 2      | (i) create table teachers(<br>tcode integer not null primary key,<br>post varchar(15) default 'Lecturer',<br>gender varchar(6) check (gender ='male' or gender = 'female'),<br>dept varchar(10),<br>salary float,<br>pannochar(10) not null unique);<br>(ii) insert into teachers values<br>(110,'professor', 'male', 'Basic Science', 65000.00, 'TYUIP3456B');<br>(iii) alter table teacher drop column dept;<br>(iv) select * from teachers where gender='male' and dept='IT';<br>(v) update teachers set salary = salary + 0.02 * salary where gender =<br>'female';<br>(vi) select * from teachers where panno like '%34%' ; | 5         |
| 3      | i) select mod(20,3); or select 20%3;<br>(ii) select instr('candidate','date');<br>(iii) select curdate(); or select current_date();<br>(iv) select truncate(256.357,2);<br>(v) select now();                                                                                                                                                                                                                                                                                                                                                                                                                                     | 5         |
| 4      | i. SELECT * FROM GAMES WHERE Prize_Money> 7000;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3         |

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |            |   |     |  |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------|---|-----|--|
|                        | <div>ii. SELECT SUM (Prize_Money), Type FROM GAMES GROUP BY Type;</div> <div>iii. SELECT COUNT (Games_Name) FROM GAMES;</div>                                                                                                                                                                                                                                                                                       |                        |            |   |     |  |
| 5                      | <div>i. 193</div> <div>ii. 194</div> <div>iii. 93.75</div> <div>iv. 6</div>                                                                                                                                                                                                                                                                                                                                         | 4                      |            |   |     |  |
| 6                      | <div>i. SELECT COUNT(*) FROM VEHICLE;</div> <div>ii. SELECT AVG(QTY) FROM VEHICLE;</div> <div>iii. SELECT SUM(PRICE) From Vehicle where Qty&gt;5;</div> <div>iv. SELECT MIN(QTY) From Vehicle;</div>                                                                                                                                                                                                                | 4                      |            |   |     |  |
| 7                      | <div>a)</div> <div><u>MIN(DOB)</u></div> <div>2</div> <div>3</div> <div>/</div> <div>0</div> <div>8</div> <div>/</div> <div>2</div> <div>0</div> <div>0</div> <div>4</div> <div>b</div> <div>)</div> <div><u>COUNT(MARKS)</u></div> <div>4</div> <div>c)</div> <table><tr><td>COUNT(DISTINCT(MARKS))</td><td>SUM(MARKS)</td></tr><tr><td>3</td><td>335</td></tr></table> <div>d)</div> <div><u>AVG(MARKS)</u></div> | COUNT(DISTINCT(MARKS)) | SUM(MARKS) | 3 | 335 |  |
| COUNT(DISTINCT(MARKS)) | SUM(MARKS)                                                                                                                                                                                                                                                                                                                                                                                                          |                        |            |   |     |  |
| 3                      | 335                                                                                                                                                                                                                                                                                                                                                                                                                 |                        |            |   |     |  |

|    |                                                                                                                                                                                                                                                                                                                 |  |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|    | 81                                                                                                                                                                                                                                                                                                              |  |
| 8  | <ul style="list-style-type: none"> <li>i. select * from stock order by price desc;</li> <li>ii. select category, sum(qty) from stock group bycategory;</li> <li>iii. select category, avg(price) from stock group bycategory;</li> <li>iv. select category, max(price) from stock group by category;</li> </ul> |  |
| 9  | <ul style="list-style-type: none"> <li>i. SELECT LENGTH(FacultyName) from faculty;</li> <li>ii. SELECT ROUND (234.6789,3);</li> <li>iii. SELECT RIGHT (LASTNAME,5) from faculty;</li> <li>iv. SELECT DAYOFYEAR (DOB) from faculty;</li> <li>v. SELECT SUBSTR(ADDRESS,3,2) from faculty;</li> </ul>              |  |
| 10 | <ul style="list-style-type: none"> <li>i) monthname(date(now()))</li> <li>ii) trim(" Panaroma")</li> <li>iii) dayname(NOW())</li> <li>iv) iv.instr(name, fname)</li> <li>v) v.mod(n1,n2)</li> </ul>                                                                                                             |  |

## Topic: COMPUTER NETWORKS

### Question Type: MCQ

| <b>QN</b> | <b>Questions</b>                                                                                                                                                                                          | <b>Marks</b> |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Q1        | Which of the following device is used for converting digital signals from a computer into analog signals for transmission over a telephone line.<br>(A) Modem<br>(B) Switch<br>(C) Repeater<br>(D) Router | 1            |
| Q2        | Which of the following is an application of VoIP technology?<br>(A) Email<br>(B) Chat<br>(C) Internet Telephony<br>(D) Web Browsing                                                                       | 1            |
| Q3        | In which network topology is every node directly connected to every other node?<br>(A) Star<br>(B) Tree<br>(C) Mesh<br>(D) Bus                                                                            | 1            |
| Q4        | Identify the networking device responsible for routing data packets based on their destination addresses.<br>(A) Modem<br>(B) Hub<br>(C) Repeater<br>(D) Router                                           | 1            |
| Q5        | In which of the network topologies do all devices connect to a central point, such as a switch or hub?<br>(A) Star<br>(B) Bus<br>(C) Tree<br>(D) Mesh                                                     | 1            |
| Q6        | A _____ is a device that connects the organization's network with the outside world                                                                                                                       | 1            |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                        |   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | <p>of the Internet.</p> <p>(A) Hub</p> <p>(B) Modem</p> <p>(C) Gateway</p> <p>(D) Repeater</p>                                                                                                                                                                                                                                                                                                                         |   |
| Q7  | <p>Which type of network covers a small geographical area like a single office, building, or school campus?</p> <p>(A) PAN</p> <p>(B) MAN</p> <p>(C) LAN</p> <p>(D) WAN</p>                                                                                                                                                                                                                                            | 1 |
| Q8  | <p>Assertion (A):- MODEM stands for modulator-demodulator.</p> <p>Reasoning (R): - It is a computer hardware device that converts data from a digital format to analog and vice versa.</p> <p>(A) Both A and R are true and R is the correct explanation for A</p> <p>(B) Both A and R are true and R is not the correct explanation for A</p> <p>(C) A is True but R is False</p> <p>(D) A is false but R is True</p> | 1 |
| Q9  | <p>Collection of hyper linked documents available on the internet is known as_____.</p> <p>(A) Website</p> <p>(B) Webpage</p> <p>(C) Web Server</p> <p>(D) Web Hosting</p>                                                                                                                                                                                                                                             | 1 |
| Q10 | <p>Television cable network is an example of:</p> <p>(A) LAN</p> <p>(B) WAN</p> <p>(C) MAN</p> <p>(D) Internet</p>                                                                                                                                                                                                                                                                                                     | 1 |
| Q11 | <p>Which amongst the following is not an example of a browser?</p>                                                                                                                                                                                                                                                                                                                                                     | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | <p>(A) Chrome</p> <p>(B) Firefox</p> <p>iii. Avast</p> <p>iv. Edge</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |
| Q12 | <p>Assertion (A): - Internet cookies are text files that contain small pieces of data, like a username, password and user's preferences while surfing the internet.</p> <p>Reasoning (R): - To make browsing the Internet faster &amp; easier, it's required to store certain information on the server's computer.</p> <p>(A) Both A and R are true and R is the correct explanation for A</p> <p>(B) Both A and R are true and R is not the correct explanation for A</p> <p>(C) A is True but R is False</p> <p>(D) A is false but R is True</p> | 1 |
| Q13 | <p>Webpages showing stock prices and weather updates change frequently, therefore such webpages are :</p> <p>(A) Fixed Webpages</p> <p>(B) Dynamic Webpages</p> <p>(C) Static Webpages</p> <p>(D) Dark Webpages</p>                                                                                                                                                                                                                                                                                                                                 | 1 |
| Q14 | <p>Name the device that converts data from digital to analog and vice versa in a network.</p> <p>(A) Router</p> <p>(B) Repeater</p> <p>(C) Modem</p> <p>(D) Gateway</p>                                                                                                                                                                                                                                                                                                                                                                             | 1 |
| Q15 | <p>I help to regenerate and amplify the signals to ensure reliable communication over long distances. Who am I?</p> <p>(A) Modem</p> <p>(B) Router</p> <p>(C) Repeater</p> <p>(D) Switch</p>                                                                                                                                                                                                                                                                                                                                                        | 1 |
| Q16 | What does a modem do at the sender's end ?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | <p>(A) It converts analog signals into digital data.</p> <p>(B) It converts digital data into analog signals.</p> <p>(C) It converts digital data into optical signals.</p> <p>(D) It converts optical signals into digital data.</p>                                                                                                                                                                                                                                                                                   |   |
| Q17 | <p>Which of the following Internet services is used for instant messaging ?</p> <p>(A) Chat</p> <p>(B) Email</p> <p>(C) WWW</p> <p>(D) Python</p>                                                                                                                                                                                                                                                                                                                                                                       | 1 |
| Q18 | <p>A _____ is a network device that can receive the data, analyse it and transmit it to other networks.</p> <p>(A) Modem</p> <p>(B) Switch</p> <p>(C) Repeater</p> <p>(D) Router</p>                                                                                                                                                                                                                                                                                                                                    | 1 |
| Q19 | <p>_____ is a service that allows to put a website or a web page on the Internet.</p> <p>(A) Web Server</p> <p>(B) Web Browser</p> <p>(C) Web Hosting</p> <p>(D) Domain Name System</p>                                                                                                                                                                                                                                                                                                                                 | 1 |
| Q20 | <p>Assertion (A): Modem stands for 'Modulator Demodulator'.</p> <p>Reason (R): The modem at the sender's end acts as a demodulator that converts the digital data into analogue signals and at the receiver's end acts as a modulator that converts analogue signals into digital data.</p> <p>(A) Both A and R are true and R is the correct explanation for A</p> <p>(B) Both A and R are true and R is not the correct explanation for A</p> <p>(C) A is True but R is False</p> <p>(D) A is false but R is True</p> | 1 |
| Q21 | <p>Temporary data files stored by websites in our computer can be used to track our online activities and also to personalize browsing experience. These files are known as :</p>                                                                                                                                                                                                                                                                                                                                       | 1 |

|     |                                                                                                                                                                                                                             |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (A) Plug-ins<br>(B) Add-ons<br>(C) Cookies<br>(D) Bookmarks                                                                                                                                                                 |   |
| Q22 | Which protocol is used while communicating through video calls on the Internet ?<br>(A) Video Over Internet Protocol<br>(B) Voice Over Internet Protocol<br>(C) Internet Protocol<br>(D) Video Audio Over Internet Protocol | 1 |
| Q23 | Every web page on the Internet has a unique address. This address is known as :<br>(A) Domain Name<br>(B) Protocol<br>(C) Uniform Resource Locator<br>(D) Network Topology                                                  | 1 |
| Q24 | In _____ topology, the devices are arranged in the form of multiple branches in hierarchical manner.<br>(A) Star<br>(B) Tree<br>(C) Mesh<br>(D) Bus                                                                         | 1 |
| Q25 | Which of the following topologies is very efficient and all nodes are connected to a central hub ?<br>(A) Star<br>(B) Tree<br>(C) Bus<br>(D) Ring                                                                           | 1 |
| Q26 | Which of the following is not a web browser ?<br>(A) Opera<br>(B) Google Chrome<br>(C) Linux                                                                                                                                | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |   |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (D) Mozilla Firefox                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |
| Q27 | <p>Assertion (A) : A static webpage does not change for each person visiting the web page.</p> <p>Reason (R) : When a web server receives a request for a dynamic web page, it locates and updates the page and sends it to the browser of the client.</p> <p>(A) Both A and R are true and R is the correct explanation for A</p> <p>(B) Both A and R are true and R is not the correct explanation for A</p> <p>(C) A is True but R is False</p> <p>(D) A is false but R is True</p> | 1 |
| Q28 | <p>Which of the following is not a network topology :</p> <p>(A) Star</p> <p>(B) Mesh</p> <p>(C) Tree</p> <p>(D) Bug</p>                                                                                                                                                                                                                                                                                                                                                               | 1 |
| Q29 | <p>For web pages where the information is changed frequently, for example, stock prices, weather information which out of the following options would you advise ?</p> <p>A) Static web page</p> <p>B) Dynamic web page</p> <p>Justify your answer.</p>                                                                                                                                                                                                                                | 1 |
| Q30 | <p>I can keep you signed in.</p> <p>I can remember your site preferences.</p> <p>I can give you locally relevant content.</p> <p>Who am I ?</p>                                                                                                                                                                                                                                                                                                                                        | 1 |

### Answers:

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Q1  | Q2  | Q3  | Q4  | Q5  | Q6  | Q7  | Q8  | Q9  | Q10 |
| A   | C   | C   | D   | A   | C   | C   | A   | A   | C   |
| Q11 | Q12 | Q13 | Q14 | Q15 | Q16 | Q17 | Q18 | Q19 | Q20 |
| C   | C   | B   | C   | C   | B   | A   | D   | C   | C   |
| Q21 | Q22 | Q23 | Q24 | Q25 | Q26 | Q27 | Q28 | Q29 | Q30 |

|   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|
| C | B | C | B | A | C | B | D | B | C |
|---|---|---|---|---|---|---|---|---|---|

### Question Type: Short Answer

| QN  | Questions                                                                                                                                                                                                                                              | Marks |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1  | Rohan, a Class XII student, has written code for a website but is unsure how to make it available on the Internet. Explain to Rohan the role of a web server and web hosting in ensuring availability of his website on the internet                   | 2     |
| Q2  | Explain the concept of VoIP and mention one benefit of using it.                                                                                                                                                                                       | 2     |
| Q3  | What is Internet and how does it differ from World Wide Web (WWW)?                                                                                                                                                                                     | 2     |
| Q4  | Explain the concept of browser cookies and mention one advantage of using them.                                                                                                                                                                        | 2     |
| Q5  | Explain the terms Web page and Home Page.                                                                                                                                                                                                              | 2     |
| Q6  | Mention any four networking goals.                                                                                                                                                                                                                     | 2     |
| Q7  | What is a Web Server ? How is it different from Web browser ?                                                                                                                                                                                          | 2     |
| Q8  | Write any one advantage and one disadvantage of bus topology.                                                                                                                                                                                          | 2     |
| Q9  | Write one function each for the following network devices :<br>(i) MODEM<br>(ii) Router                                                                                                                                                                | 2     |
| Q10 | Write any one advantage and any one disadvantage of star topology.                                                                                                                                                                                     | 2     |
| Q11 | Define the following terms :<br>(i) Web Hosting<br>(ii) WWW                                                                                                                                                                                            | 2     |
| Q12 | With reference to browsing the websites, briefly explain the term cookies. Also mention any two points of significance of it.                                                                                                                          | 2     |
| Q13 | Give any two points of difference between Static web page and Dynamic web page.                                                                                                                                                                        | 2     |
| Q14 | Describe the role of a router in a network.                                                                                                                                                                                                            | 2     |
| Q15 | Expand URL. Identify the protocol and domain in the following URL :<br><a href="https://epathshala.nic.in/topics.php?len=en">https ://epathshala.nic.in/topics.php?len=en</a>                                                                          | 2     |
| Q16 | What is the primary function of a gateway in a computer network ? Explain briefly.                                                                                                                                                                     | 2     |
| Q17 | Rushil thought “WWW” and “Internet” are synonyms i.e., they meant same and can be used interchangeably. But the teacher said that they are not same. Help him to understand the meaning of both the terms with the help of a suitable example of each. | 2     |

|     |                                                                                                                                                                                                   |   |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q18 | Danny has created a website on Python resources on his laptop. Now, he wants that others should be able to access his website and use the resources. What should he do to achieve his objective ? | 2 |
| Q19 | Arshiya is a web developer and one of her clients wants her to design a web page to accept donations for an NGO. Which type of web page (static/dynamic) will she create ?                        | 2 |
| Q20 | Define the following terms :<br>(a) Plug-ins<br>(b) Add-ons                                                                                                                                       | 2 |

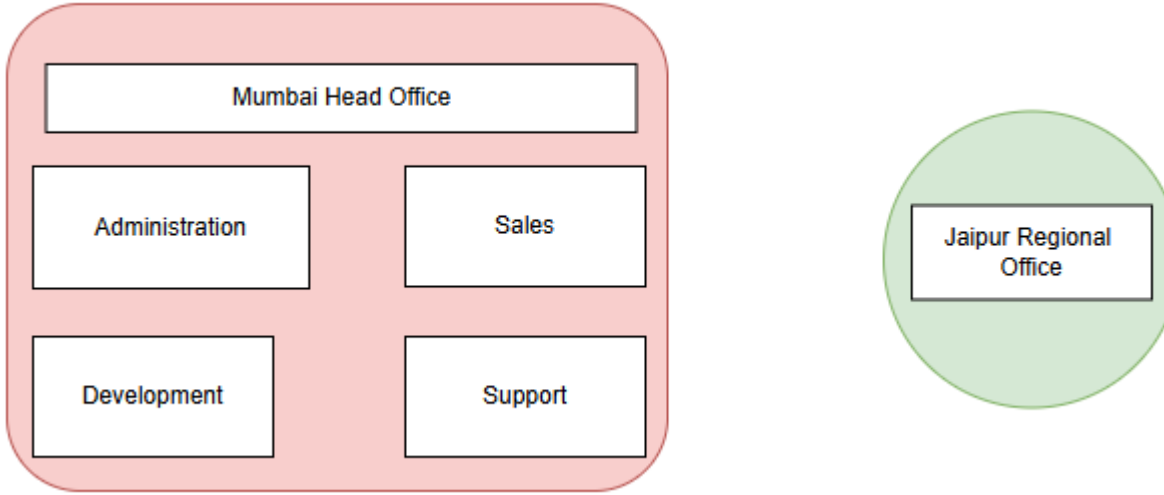
### ANSWERS

| QN | Answers                                                                                                                                                                                                        | Marks |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1  | A web server is a computer system that hosts websites and delivers web pages to users when requested.<br>Web hosting is the service that makes a website accessible on the Internet by storing it on a server. | 2     |
| 2  | VoIP stands for Voice over Internet Protocol, which enables voice communication over the Internet.<br>One benefit is that it reduces call costs compared to traditional telephony.                             | 2     |
| 3  | The Internet is a global network of interconnected computers.<br>The World Wide Web (WWW) is a collection of websites and web pages accessed via the Internet.                                                 | 2     |
| 4  | Browser cookies are small text files stored on a user's computer by websites.<br>One advantage is that they help personalize browsing experiences by remembering user preferences.                             | 2     |
| 5  | A web page is a single document on the Internet that may contain text, images, and links.<br>The home page is the main page of a website that serves as its starting point.                                    | 2     |
| 6  | 1. Resource sharing<br>2. Reliability<br>3. Scalability<br>4. Communication and collaboration                                                                                                                  | 2     |

| 7                                            | A web server stores, processes, and delivers web pages to clients.<br>A web browser is an application used to request and display web pages from the server.                                                                                                                                                                                                                                                          | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|----------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------|---|
| 8                                            | One advantage of bus topology is that it is cost-effective and easy to install.<br>One disadvantage is that if the main cable fails, the entire network goes down.                                                                                                                                                                                                                                                    | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 9                                            | (i) A modem converts digital signals into analog signals and vice versa.<br>(ii) A router forwards data packets between different networks based on IP addresses.                                                                                                                                                                                                                                                     | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 10                                           | One advantage of star topology is that failure of one computer does not affect others.<br>One disadvantage is that if the central hub fails, the whole network stops working.                                                                                                                                                                                                                                         | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 11                                           | (i) Web hosting is a service that provides storage space and access to websites on the Internet.<br>(ii) WWW is a system of interlinked hypertext documents that can be accessed via the Internet.                                                                                                                                                                                                                    | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 12                                           | Cookies are small text files stored by websites in a user's browser.<br>They remember login information.<br>They help personalize browsing experience.                                                                                                                                                                                                                                                                | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 13                                           | <table><thead><tr><th>Static Web Page</th><th>Dynamic Web Page</th></tr></thead><tbody><tr><td>1. Displays the same content for every user.</td><td>1. Content changes according to user interaction or database updates.</td></tr><tr><td>2. Created using simple HTML and CSS only.</td><td>2. Created using server-side scripting languages like PHP, ASP, or JavaScript with databases.</td></tr></tbody></table> | Static Web Page | Dynamic Web Page | 1. Displays the same content for every user. | 1. Content changes according to user interaction or database updates. | 2. Created using simple HTML and CSS only. | 2. Created using server-side scripting languages like PHP, ASP, or JavaScript with databases. | 2 |
| Static Web Page                              | Dynamic Web Page                                                                                                                                                                                                                                                                                                                                                                                                      |                 |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 1. Displays the same content for every user. | 1. Content changes according to user interaction or database updates.                                                                                                                                                                                                                                                                                                                                                 |                 |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 2. Created using simple HTML and CSS only.   | 2. Created using server-side scripting languages like PHP, ASP, or JavaScript with databases.                                                                                                                                                                                                                                                                                                                         |                 |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 14                                           | A router directs data packets between different networks.<br>It ensures that data reaches the correct destination using IP addresses.                                                                                                                                                                                                                                                                                 | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 15                                           | URL stands for Uniform Resource Locator.<br>In https://epathshala.nic.in/topics.php?len=en , the protocol is https and the domain is nic.in.                                                                                                                                                                                                                                                                          | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 16                                           | A gateway is a network device that connects two different networks.<br>Its primary function is to translate data formats and ensure communication between them.                                                                                                                                                                                                                                                       | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |
| 17                                           | The Internet is a global network of computers used for data exchange (e.g., email).                                                                                                                                                                                                                                                                                                                                   | 2               |                  |                                              |                                                                       |                                            |                                                                                               |   |

|    |                                                                                                                                                                                |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|    | The WWW is a service on the Internet providing websites and hyperlinked documents (e.g., Wikipedia).                                                                           |   |
| 18 | Danny must host his website on a web server using a web hosting service.<br>This will make it accessible to others through the Internet.                                       | 2 |
| 19 | Arshiya should create a dynamic web page.<br>A dynamic page allows users to interact and make online payments securely.                                                        | 2 |
| 20 | (a) Plug-ins are software components that add specific features to applications.<br>(b) Add-ons are additional tools or extensions that enhance the functionality of browsers. |   |

### Question Type: Long Answer

| QN             | Questions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Marks     |    |          |                |       |           |                |             |           |   |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----|----------|----------------|-------|-----------|----------------|-------------|-----------|---|
| Q1             | <p>ABC Pvt Ltd. is a leading global IT solutions provider. The company's head office is in Mumbai while its Regional Office is in Jaipur. The Mumbai office consists of four departments: Administration, Sales, Development, and Support.</p>  <p>The distances between these departments, as well as between Mumbai and Jaipur, are as follows:</p> <table border="1"> <thead> <tr> <th>From</th><th>To</th><th>Distance</th></tr> </thead> <tbody> <tr> <td>Administration</td><td>Sales</td><td>60 meters</td></tr> <tr> <td>Administration</td><td>Development</td><td>90 meters</td></tr> </tbody> </table> | From      | To | Distance | Administration | Sales | 60 meters | Administration | Development | 90 meters | 5 |
| From           | To                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Distance  |    |          |                |       |           |                |             |           |   |
| Administration | Sales                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 60 meters |    |          |                |       |           |                |             |           |   |
| Administration | Development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 90 meters |    |          |                |       |           |                |             |           |   |

|                |               |                 |
|----------------|---------------|-----------------|
| Administration | Support       | 120 meters      |
| Sales          | Development   | 50 meters       |
| Sales          | Support       | 70 meters       |
| Development    | Support       | 45 meters       |
| Mumbai Office  | Jaipur Office | 1400 kilometres |

The number of computers in each department/office is as follows:

|                |     |
|----------------|-----|
| Administration | 120 |
| Sales          | 40  |
| Development    | 70  |
| Support        | 25  |
| Jaipur Office  | 50  |

As a network engineer, you have to propose solutions for various queries listed from I to V.

I. Suggest the most suitable department in the Mumbai Office Setup, to install the server. Also, give a reason to justify your suggested location.

II. Draw a suitable cable layout of wired network connectivity between the departments in the Mumbai Office.

III. Which hardware device will you suggest to connect all the computers within each department?

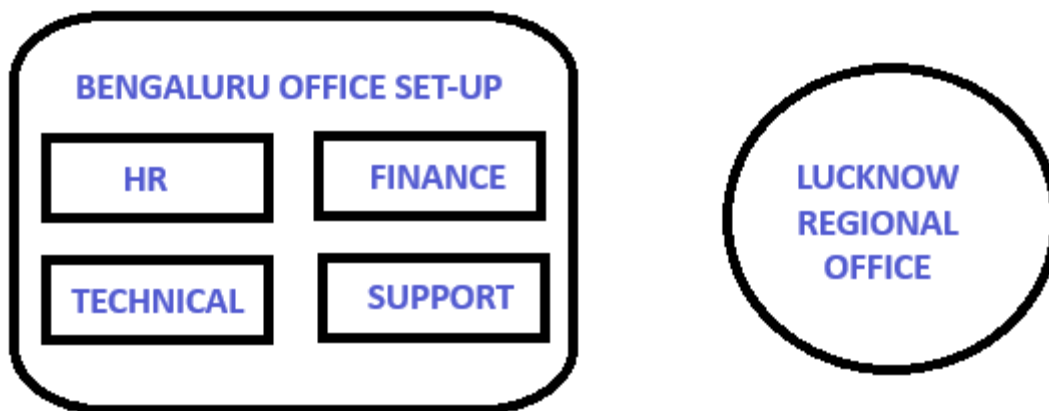
IV. Suggest the most appropriate type of network (LAN, MAN, WAN) to connect the Mumbai Head Office and Jaipur Regional Office.

V. When a signal is transmitted through a wire from Administration department to Support department, its strength reduces. Which device would you suggest the company use to solve this problem?

|    |                                                                                                                                                                                                                                                         |   |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q2 | XYZ Pvt. Ltd., a multinational technology company, is looking to establish its Indian Head Office in Bengaluru, and a regional office branch in Lucknow. The Bengaluru head office will be organized into four departments: HR, FINANCE, TECHNICAL, AND | 5 |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|

SUPPORT.

As a network engineer, you have to propose solutions for various queries listed from I to V.



The shortest distances between the departments/offices are as follows:

| From             | To        | Distance        |
|------------------|-----------|-----------------|
| HR               | Finance   | 65 meters       |
| HR               | Technical | 80 meters       |
| HR               | Support   | 70 meters       |
| Finance          | Technical | 60 meters       |
| Finance          | Support   | 75 meters       |
| Technical        | Support   | 50 meters       |
| Bengaluru Office | Lucknow   | 1900 kilometers |

The number of computers in each department/office is as follows:

|                |     |
|----------------|-----|
| HR             | 175 |
| Finance        | 35  |
| Technical      | 50  |
| Support        | 15  |
| Lucknow Office | 40  |

I. Suggest the most suitable department in the Bengaluru Office Setup, to install the server. Also, give a reason to justify your suggested location.

II. Draw a suitable cable layout of wired network connectivity between the departments

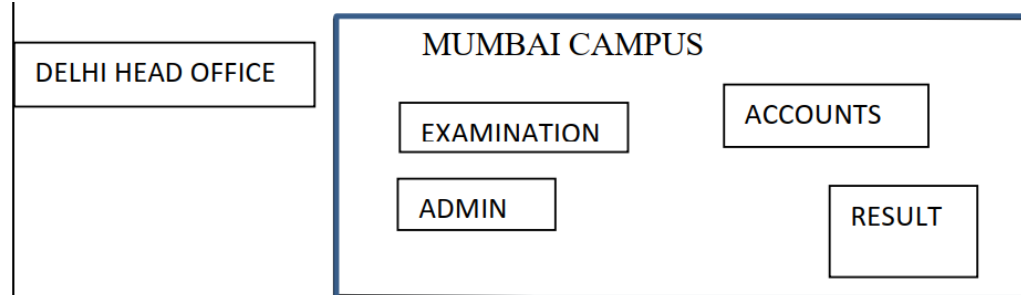
in the Bengaluru Office.

III. Which networking device would you suggest the company to purchase to interconnect all the computers within a department in Bengaluru Office?

IV. The company is considering establishing a network connection between its Bengaluru Head Office and Lucknow regional office. Which type of network—LAN, MAN, or WAN—will be created? Justify your answer.

V. The company plans to develop an interactive website that will enable its employees to monitor their performance after login. Would you recommend a static or dynamic website, and why?

Q3 Prime Computer services Ltd. is an international educational organization. It is planning to set up its India campus at Mumbai with its head office in Delhi. The Mumbai office campus has four main buildings-ADMIN, ACCOUNTS, EXAMINATION and RESULT. You as a network expert have to suggest the best network related solutions for their problems raised in (i) to (v), keeping in mind the distances between the buildings and other given parameters.



Shortest distances between various buildings:

| FROM              | TO            | DISTANCE/TIME (M) |
|-------------------|---------------|-------------------|
| ADMIN             | ACCOUNTS      | 55 M              |
| ADMIN             | EXAMINATION   | 90 M              |
| ADMIN             | RESULT        | 50 M              |
| ACCOUNTS          | EXAMINATION   | 55 M              |
| ACCOUNTS          | RESULT        | 50 M              |
| EXAMINATION       | RESULT        | 45 M              |
| DELHI HEAD OFFICE | MUMBAI CAMPUS | 2150 M            |

Number of computers installed at various buildings are as follows:

|                   |     |
|-------------------|-----|
| ADMIN             | 110 |
| ACCOUNTS          | 75  |
| EXAMINATION       | 40  |
| RESULT            | 12  |
| DELHI HEAD OFFICE | 20  |

(i) Suggest the most appropriate location of the server inside the MUMBAI campus (out of the four buildings) to get the best connectivity for maximum number of computers. Justify your answer.

(ii) Suggest and draw cable layout to efficiently connect various buildings within the MUMBAI campus for a wired connectivity.

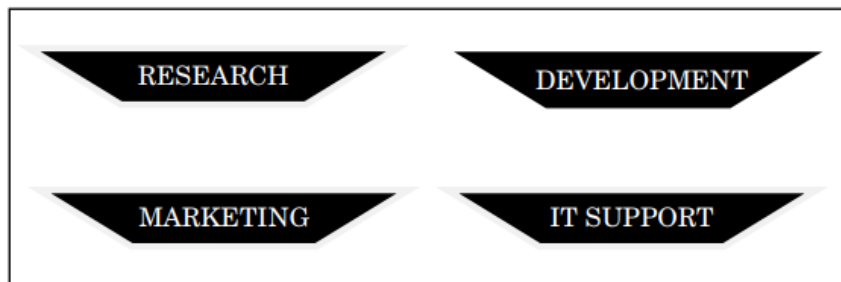
(iii) Which networking device will you suggest to be procured by the company to interconnect all the computers of various buildings of MUMBAI campus?

(iv) Company is planning to get its website designed which will allow students to see their results after registering themselves on its server. Out of the static or dynamic, which type of website will you suggest?

(v) Which of the following will you suggest to establish the online face to face communication between the people in the ADMIN office of Mumbai campus and Delhi head office?

a) Cable TV                      b) Email                      c) Video conferencing                      d) Text chat

Q4 ABC Innovators Pvt. Ltd., Bengaluru is a company specializing in IoT solutions. They have different departments : Research, Development, Marketing and IT Support. The layout of the Bengaluru branch is as follows :



Distance between the departments :

5

- Research to Development : 60 m
- Research to Marketing : 80 m
- Research to IT Support : 70 m
- Development to Marketing : 100 m
- Development to IT Support : 90 m
- Marketing to IT Support : 110 m

Number of computers in each department :

- Research : 40
- Development : 120
- Marketing : 100
- IT Support : 20

Based on the above specifications, answer the following questions :

- Suggest the topology and draw the most suitable cable layout for connecting all the departments in the Bengaluru office.
- Suggest the type of network (LAN/MAN/WAN) that will be created when the Research department is connected to the Development department. Justify your answer.
- Suggest the department for the placement of the server. Explain the reason for your selection.
- Suggest the placement of switch / hub with justification.
- Employees of Bengaluru campus frequently use VoIP technology to communicate with their foreign clients. What is the full form of VoIP ?

Q5 XYZ Media house campus is in Delhi and has 4 blocks named Z1, Z2, Z3 and Z4. The tables given below show the distance between different blocks and the number of computers in each block.

| From - To            | Distance  |
|----------------------|-----------|
| Block Z1 to Block Z2 | 80 metres |
| Block Z1 to Block Z3 | 65 metres |
| Block Z1 to Block Z4 | 90 metres |

|                      |            |
|----------------------|------------|
| Block Z2 to Block Z3 | 45 metres  |
| Block Z2 to Block Z4 | 120 metres |
| Block Z3 to Block Z4 | 60 metres  |

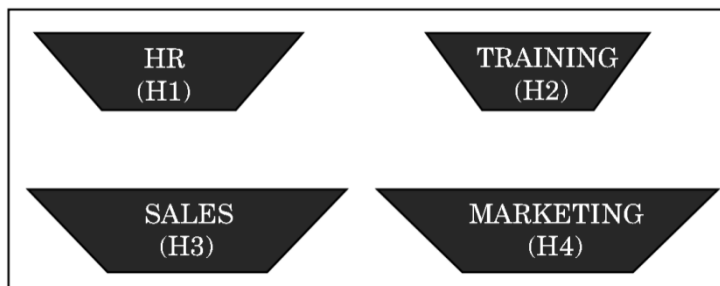
| Block | Number of Computers |
|-------|---------------------|
| Z1    | 135                 |
| Z2    | 290                 |
| Z3    | 180                 |
| Z4    | 195                 |

The company is planning to form a network by joining these blocks.

- Out of the four blocks on campus, suggest the location of the server that will provide the best connectivity. Explain your response.
- For very fast and efficient connections between various blocks within the campus, suggest a suitable topology and draw the same.
- Suggest the placement of the following devices with justification  
(a) Repeater      (b) Hub/Switch
- VoIP technology is to be used which allows one to make voice calls using a broadband internet connection. Expand the term VoIP.
- The XYZ Media House intends to link its Mumbai and Delhi centers.  
Out of LAN, MAN, or WAN, what kind of network will be created? Justify your answer.

Q6

Classpoint Pvt. Ltd., Pune is a company that deals with development and training of software. They have different divisions HR (H1), Training (H2), Sales (H3) and Marketing (H4). The layout of the Pune branch is :



The management wants to connect all the divisions as well as all the computers of each division (H1, H2, H3 and H4).

5

Distance between the divisions are as follows :

| From | To | Distance (m) |
|------|----|--------------|
| H1   | H2 | 90           |
| H1   | H3 | 145          |
| H1   | H4 | 88           |
| H2   | H3 | 110          |
| H2   | H4 | 80           |
| H3   | H4 | 160          |

Number of computers in each division :

| Division | Number of Computers |
|----------|---------------------|
| H1       | 100                 |
| H2       | 220                 |
| H3       | 160                 |
| H4       | 140                 |

Based on the above specifications, answer the following questions :

(i) Suggest the topology and draw the most suitable cable layout for connecting all the divisions.

(ii) Classpoint Pvt. Ltd. plans to establish a new office in Dubai. Out of LAN, MAN and WAN, what kind of network will be created to connect Pune office with Dubai office ?

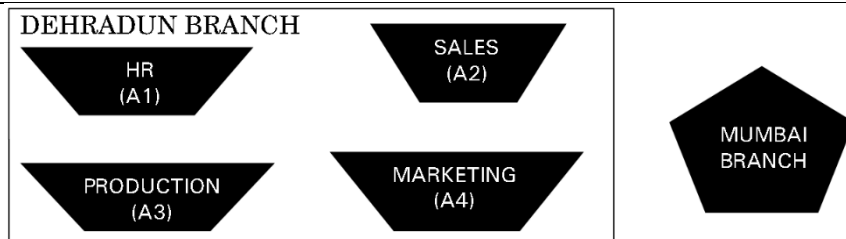
(iii) Suggest the division for the placement of server in Pune office. Explain the reason for your selection.

(iv) Suggest the placement of switch/hub with justification.

(v) Ms. Abhilasha, working in Dubai office, is creating a software for conducting program for the employees of Pune branch. Which protocol would help her in voice transmission over a computer network ?

Q7 AWESOME Private Ltd, Dehradun is a company that deals with hardware components. They have different divisions HR (A1), Sales (A2), Production (A3) and Marketing (A4). The layout of the Dehradun branch is :

5



The company also has a branch in Mumbai. The management wants to connect all the divisions as well as the computers of each division (A1, A2, A3, A4)

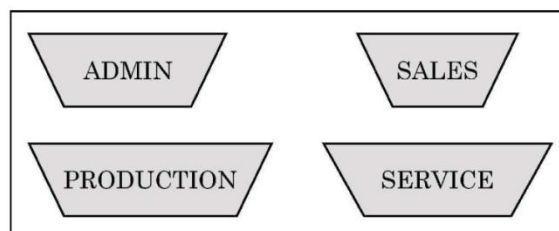
Distance between the wings are as follows :

| From                 | To            | Distance |
|----------------------|---------------|----------|
| A3                   | A1            | 32 m     |
| A1                   | A2            | 53 m     |
| A2                   | A4            | 29 m     |
| A4                   | A3            | 110 m    |
| A3                   | A2            | 750 m    |
| A1                   | A4            | 200 m    |
| Dehradun Head Office | Mumbai Office | 1656 km  |

Number of computers in each wing :

| Division | Number of Computers |
|----------|---------------------|
| A1       | 70                  |
| A2       | 140                 |
| A3       | 55                  |
| A4       | 70                  |

Q8 XYZ Technologies, Hyderabad is a company that deals with data science and AI projects. They have different divisions ADMIN, SALES, PRODUCTION and SERVICE. The layout of the Hyderabad branch is :



The management wants to connect all the divisions as well as the computers of each division (ADMIN, SALES, PRODUCTION and SERVICE).

Distance between the divisions are as follows :

5

| From       | To         | Distance (m) |
|------------|------------|--------------|
| ADMIN      | SALES      | 69           |
| ADMIN      | PRODUCTION | 84           |
| ADMIN      | SERVICE    | 60           |
| SALES      | PRODUCTION | 110          |
| SALES      | SERVICE    | 135          |
| PRODUCTION | SERVICE    | 90           |

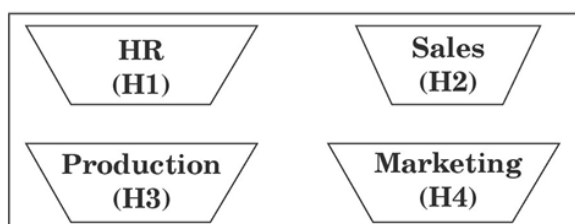
Number of computers in each division :

| Division   | Number of Computers |
|------------|---------------------|
| ADMIN      | 40                  |
| SALES      | 75                  |
| PRODUCTION | 120                 |
| SERVICE    | 20                  |

Based on the above specifications, answer the following questions :

- (i) Suggest the topology and draw the most suitable cable layout for connecting all the divisions in the Hyderabad office.
- (ii) XYZ Technologies is having its head office in USA. Out of LAN, MAN and WAN, which kind of network will be created to connect Hyderabad office with USA Office ? Justify your answer. (iii) Suggest the division for the placement of server. Explain the reason for your selection. (iv) Suggest the placement of Switch/Hub with justification. (v) Where will a repeater be placed in the suggested network layout ? Justify your answer.

- Q9 FULLMAN Tech, Bengaluru is a company that deals with software development. They have different divisions HR (H1), Sales (H2), Production (H3) and Marketing (H4). The layout of the Bengaluru branch is :



The management wants to connect all the divisions as well as all the computers of each division (H1, H2, H3 and H4).

Distance between the divisions are as follows :

| From | To | Distance (m) |
|------|----|--------------|
| H1   | H2 | 76           |
| H1   | H3 | 185          |
| H1   | H4 | 88           |
| H2   | H3 | 140          |
| H2   | H4 | 125          |
| H3   | H4 | 160          |

Number of computers in each of the division are :

| Division | Number of Computers |
|----------|---------------------|
| H1       | 140                 |
| H2       | 340                 |
| H3       | 180                 |
| H4       | 260                 |

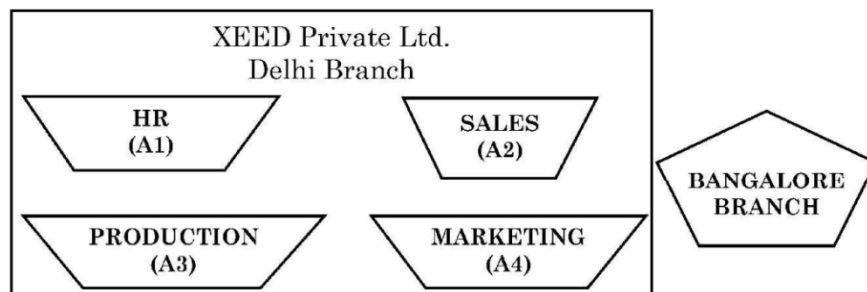
Based on the above specifications, answer the following questions :

- (i) Suggest the topology and draw the most efficient cable layout for connecting all the divisions of Bengaluru branch.
- (ii) FULLMAN Tech is expanding its reach and therefore it establishes a new office in Delhi. Out of LAN, MAN, and WAN what kind of network will be created to connect Bengaluru office with Delhi Office ?
- (iii) Suggest the division for the placement of server in Bengaluru branch. Explain the reason for your selection.
- (iv) Suggest the placement of the following devices in Bengaluru branch :
  - (a) Repeater
  - (b) Switch/Hub
- (v) The company's manager Ms. Ritu is worried as to how she can extend and modify the functionality of the web browser. Help her by giving names of any two tools.

Q10 XEED Private Ltd., Delhi is a company that deals with educational toys. They have different divisions HR (A1), Sales (A2), Production (A3) and Marketing (A4).

5

The layout of the Delhi branch is :



The company also has a branch in Bangalore. The management wants to connect all the divisions as well as all the computers of each division (A1, A2, A3, A4).

Distance between the wings are as follows :

| Connection                            | Distance |
|---------------------------------------|----------|
| A3 to A1                              | 25 m     |
| A1 to A2                              | 40 m     |
| A2 to A4                              | 25 m     |
| A4 to A3                              | 20 m     |
| A3 to A2                              | 30 m     |
| A1 to A4                              | 170 m    |
| Delhi Head Office to Bangalore Office | 2154 km  |

Number of Computers in each of the wing :

| Division | Number of Computers |
|----------|---------------------|
| A1       | 50                  |
| A2       | 40                  |
| A3       | 110                 |
| A4       | 60                  |

Based on the above specifications, answer the following questions :

(i) Suggest the topology and draw the most suitable cable layout for connecting all the divisions of Delhi branch.

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <p>(ii) Suggest the kind of network required (out of LAN, MAN, WAN) for connecting Production (A3) with the Bangalore branch.</p> <p>(iii) Which device can be used to connect the network of Delhi Branch to the Internet ? This device should be able to receive data, analyse it and then transmit it to the network.</p> <p>(iv) Suggest the placement of switch/hub with justification.</p> <p>(v) Many employees were finding it difficult to cope up with work pressure and hence were showing stress related symptoms. In order to improve the mental health of its employees, HR planned to conduct an online session with a mental health expert from Mumbai. Out of the options given below, suggest the protocol that will help to send the voice signals over internet to conduct the session successfully.</p> <p>(a) FTP                      (b) SMTP                      (c) VOIP                      (d) POP</p> |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

### Answers

| QN | Answers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Marks |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1  | <p>(i) The server should be placed in the Administration department because it has the maximum number of computers (120), ensuring efficient access.</p> <p>(ii) Cable layout: Connect departments in shortest path manner (Administration–Sales, Administration–Development, Development–Support).</p> <p>(iii) Within each department, a switch should be used to connect computers.</p> <p>(iv) To connect Mumbai Head Office and Jaipur Office, use a WAN because offices are far apart geographically.</p> <p>(v) Use a Repeater between Administration and Support to boost signal strength.</p> | 5     |
| 2  | <p>(i) The server should be placed in HR department as it has the maximum number of computers (175).</p> <p>(ii) Cable layout: Shortest path interconnection among all departments (HR–Finance–Technical–Support).</p> <p>(iii) Within each department, a switch should be used.</p> <p>(iv) A WAN will be created between Bengaluru and Lucknow as the distance is 1900 km.</p> <p>(v) A Dynamic website is recommended because it allows employees to login and check</p>                                                                                                                            | 5     |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |
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|   | performance interactively.                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |
| 3 | <p>(i) The server should be placed in ADMIN building as it has the highest number of computers (110).</p> <p>(ii) Cable layout: ADMIN connected to ACCOUNTS, RESULT, and EXAMINATION in a star-like design.</p> <p>(iii) Use switches to interconnect computers across buildings.</p> <p>(iv) A Dynamic website is needed so students can view results after registration.</p> <p>(v) For communication, Video Conferencing should be used.</p>                | 5 |
| 4 | <p>(i) Suitable topology: Star topology with all departments connected to a central hub.</p> <p>(ii) A LAN will be created between Research and Development as they are in the same campus.</p> <p>(iii) The server should be placed in Development department as it has the maximum computers (120).</p> <p>(iv) The switch/hub should be placed in Development department for efficient access.</p> <p>(v) VoIP stands for Voice over Internet Protocol.</p> | 5 |
| 5 | <p>(i) The server should be in Block Z2 since it has the highest number of computers (290).</p> <p>(ii) Suitable topology: Star topology with Z2 as the central node.</p> <p>(iii) Repeater should be placed between blocks with large distance (Z2–Z4). Switch should be placed in Z2.</p> <p>(iv) VoIP expands to Voice over Internet Protocol.</p> <p>(v) A WAN will be required to connect Mumbai and Delhi centres.</p>                                   | 5 |
| 6 | <p>(i) Suitable topology: Star topology connecting all divisions via central node.</p> <p>(ii) A WAN will be created to connect Pune office with Dubai.</p> <p>(iii) Server should be placed in H2 as it has the maximum number of computers (220).</p> <p>(iv) Switch should be placed in H2 for central connectivity.</p> <p>(v) The protocol is VoIP.</p>                                                                                                   | 5 |
| 7 | <p>(i) Suitable topology: Star topology for connecting all divisions.</p> <p>(ii) A WAN is needed to connect Dehradun and Mumbai offices.</p> <p>(iii) Server should be placed in A2 as it has the maximum number of computers (140).</p>                                                                                                                                                                                                                      | 5 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                        |   |
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|    | (iv) Switch should be placed in A2 to centralize connections.<br>(v) Repeater should be placed between A3 and A2 due to 750 m distance.                                                                                                                                                                                                                                                                |   |
| 8  | (i) Suitable topology: Star topology with central connectivity.<br>(ii) To connect Hyderabad office with USA, a WAN is required due to long distance.<br>(iii) Server should be placed in Production as it has the maximum number of computers (120).<br>(iv) Switch/hub should be placed in Production for better connectivity.<br>(v) A repeater should be placed between Sales and Service (135 m). | 5 |
| 9  | (i) Suitable topology: Star topology for efficient communication.<br>(ii) A WAN will connect Bengaluru and Delhi.<br>(iii) Server should be placed in H2 as it has the maximum number of computers (340).<br>(iv) Repeater should be used between H1 and H3 (185 m). Switch/hub should be placed in H2.<br>(v) Two tools to extend browser functionality are Plug-ins and Add-ons.                     | 5 |
| 10 | (i) Suitable topology: Star topology with central connectivity.<br>(ii) To connect Delhi and Bangalore offices, a WAN will be used.<br>(iii) A Router can be used to connect the branch network to the Internet.<br>(iv) Switch should be placed in A3 as it has the maximum number of computers (110).<br>(v) The correct protocol is VoIP.                                                           | 5 |

### BOARD QUESTIONS

| Q.N. | Section A<br><br><b>Topic: <u>Computer Networks</u></b><br><br><b>Question Type: MCQ (Multiple Choice Questions/Fill in the Blank)</b>                                 | Marks |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1   | Which device converts the analog signal received over a telephone line back into digital data for a computer?<br>(A) Router    (B) Modem    (C) Repeater    (D) Switch | 1     |

|                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                             |   |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q2                                                                                                         | Which topology connects every computer to a single shared cable running along the length of the network?<br>(A) Star (B) Mesh (C) Bus (D) Tree                                                                                                                                                                                                                              | 1 |
| Q3                                                                                                         | Which device forwards incoming data only to the port of the intended recipient, rather than broadcasting it to every device?<br>(A) Repeater (B) Switch (C) Modem (D) Gateway                                                                                                                                                                                               | 1 |
| Q4                                                                                                         | A device that joins a private network to a network using an entirely different set of protocols is called a:<br>(A) Router (B) Repeater (C) Gateway (D) Hub                                                                                                                                                                                                                 | 1 |
| Q5                                                                                                         | . Which topology arranges nodes in a hierarchical, branching structure spreading out from a root node?<br>(A) Bus (B) Mesh (C) Star (D) Tree                                                                                                                                                                                                                                | 1 |
| Q6                                                                                                         | Which network type would typically connect the computers within a single classroom or computer lab?<br>(A) WAN (B) LAN (C) MAN (D) PAN                                                                                                                                                                                                                                      | 1 |
| Q7                                                                                                         | A fibre network linking traffic-signal control units across an entire city is best described as a:<br>(A) LAN (B) PAN (C) WAN (D) MAN                                                                                                                                                                                                                                       | 1 |
| Q8                                                                                                         | Assertion (A): A repeater regenerates a signal without altering the data it carries.<br>Reasoning (R): Signal strength weakens as it travels long distances along a cable.<br>(A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true and R is not the correct explanation of A (C) A is true but R is false (D) A is false but R is true | 1 |
| Q9                                                                                                         | A collection of linked webpages hosted together under a single domain is called a:<br>(A) Web browser (B) Website (C) Web server (D) URL                                                                                                                                                                                                                                    | 1 |
| Q10                                                                                                        | Which of these is an example of a Metropolitan Area Network?<br>(A) A home Wi-Fi router (B) A city's traffic-signal network (C) Bluetooth file transfer (D) An undersea cable linking continents                                                                                                                                                                            | 1 |
| Q11                                                                                                        | Which of the following is NOT a web browser?<br>(A) Brave (B) Opera (C) Notepad (D) Vivaldi                                                                                                                                                                                                                                                                                 | 1 |
| Q12                                                                                                        | Assertion (A): Cookies help a website remember a user's login details and preferences.<br>Reasoning (R): Cookies are large executable programs that install themselves on the user's hard disk.<br>(A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true                                                                                | 1 |
| <div> <div>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</div> <div>Page <b>140</b> of <b>183</b></div> </div> |                                                                                                                                                                                                                                                                                                                                                                             |   |

|     |                                                                                                                                                                                                                                                                                                                                                                                                    |   |
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|     | and R is not the correct explanation of A (C) A is true but R is false (D) A is false but R is true                                                                                                                                                                                                                                                                                                |   |
| Q13 | A webpage displaying live cricket scores that update every few seconds is best described as a:<br>(A) Static webpage (B) Fixed webpage (C) Dynamic webpage (D) Archived webpage                                                                                                                                                                                                                    | 1 |
| Q14 | Which device is primarily used to interconnect two or more separate networks and choose the best path for data?<br>(A) Hub (B) Switch (C) Router (D) Modem                                                                                                                                                                                                                                         | 1 |
| Q15 | Which of the following amplifies and regenerates a signal to extend the reach of a network?<br>(A) Switch (B) Repeater (C) Gateway (D) Modem                                                                                                                                                                                                                                                       | 1 |
| Q16 | What does a modem do at the receiver's end of a transmission?<br>(A) Converts the analog signal to digital data (B) Converts digital data to an analog signal (C) Converts digital data to an optical signal (D) Blocks unwanted signals                                                                                                                                                           | 1 |
| Q17 | In a ___ topology, every device has a dedicated point-to-point link to every other device.<br>(A) Bus (B) Star (C) Mesh (D) Tree                                                                                                                                                                                                                                                                   | 1 |
| Q18 | Assertion (A): The Internet and the World Wide Web mean exactly the same thing.<br>Reasoning (R): The WWW is a service that runs on top of the Internet, using HTTP to deliver hyperlinked pages.<br>(A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true and R is not the correct explanation of A (C) A is true but R is false (D) A is false but R is true | 1 |
| Q19 | Which protocol family is fundamental to communication across the Internet?<br>(A) HTML (B) TCP/IP (C) URL (D) WWW                                                                                                                                                                                                                                                                                  | 1 |
| Q20 | Small files that a browser stores on your device to remember site preferences are called:<br>(A) Plug-ins (B) Bookmarks (C) Cookies (D) Add-ons                                                                                                                                                                                                                                                    | 1 |
| Q21 | Which of the following best defines a URL?<br>(A) Software used to browse the web (B) The unique address of a resource on the web (C) A programming language for webpages (D) A device that connects to the internet                                                                                                                                                                               | 1 |

|                 |                                                                                                                                                                                                                                                                                                                                                                                            |       |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q22             | Which topology needs the least amount of cable to connect all the nodes?<br>(A) Mesh (B) Star (C) Bus (D) Tree                                                                                                                                                                                                                                                                             | 1     |
| Q23             | Which protocol allows users to make voice calls using an internet connection instead of a telephone line?<br>(A) FTP (B) VoIP (C) SMTP (D) HTTP                                                                                                                                                                                                                                            | 1     |
| Q24             | Assertion (A): A static webpage is written using only HTML and CSS. Reasoning (R): Static webpages require a database and server-side scripting to display their content.<br>(A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true and R is not the correct explanation of A (C) A is true but R is false (D) A is false but R is true                 | 1     |
| Q25             | The service that stores a website's files on a server and makes it accessible on the internet is called:<br>(A) Web browsing (B) Web hosting (C) Web caching (D) Web scripting                                                                                                                                                                                                             | 1     |
| Q26             | Which of the following is NOT a network topology?<br>(A) Star (B) Bus (C) Tree (D) Socket                                                                                                                                                                                                                                                                                                  | 1     |
| Q27             | Software components that enable a browser to display special content such as a PDF or a media file are known as:<br>(A) Cookies (B) Plug-ins (C) Bookmarks (D) Extensions                                                                                                                                                                                                                  | 1     |
| Q28             | Assertion (A): A gateway can connect two networks that use entirely different protocols. Reasoning (R): A gateway operates only within a single LAN and cannot reach any outside network.<br>(A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true and R is not the correct explanation of A (C) A is true but R is false (D) A is false but R is true | 1     |
| Q29             | Which network type would best connect a company's Delhi office to its branch office in Singapore?<br>(A) LAN (B) PAN (C) MAN (D) WAN                                                                                                                                                                                                                                                       | 1     |
| Q30             | For webpages that require users to log in and view personalized content, such as a bank statement, which type of webpage is required?<br>(A) Static (B) Archived (C) Dynamic (D) Cached                                                                                                                                                                                                    | 1     |
| <b>Answers-</b> |                                                                                                                                                                                                                                                                                                                                                                                            |       |
| QN.             | Answers                                                                                                                                                                                                                                                                                                                                                                                    | Marks |
| Ans.1           | (B) Modem                                                                                                                                                                                                                                                                                                                                                                                  | 1     |

|                                                                                                            |                                                                                           |   |
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| Ans.2                                                                                                      | (C) Bus                                                                                   | 1 |
| Ans.3                                                                                                      | (B) Switch                                                                                | 1 |
| Ans.4                                                                                                      | (C) Gateway                                                                               | 1 |
| Ans.5                                                                                                      | (D) Tree                                                                                  | 1 |
| Ans.6                                                                                                      | (B) LAN                                                                                   | 1 |
| Ans.7                                                                                                      | (D) MAN                                                                                   | 1 |
| Ans.8                                                                                                      | (A) Both A and R are true and R is the correct explanation of A                           | 1 |
| Ans.9                                                                                                      | (B) Website                                                                               | 1 |
| Ans.10                                                                                                     | (B) A city's traffic-signal network                                                       | 1 |
| Ans.11                                                                                                     | (C) Notepad                                                                               | 1 |
| Ans.12                                                                                                     | (C) A is true but R is false                                                              | 1 |
| Ans.13                                                                                                     | (C) Dynamic webpage                                                                       | 1 |
| Ans.14                                                                                                     | (C) Router                                                                                | 1 |
| Ans.15                                                                                                     | (B) Repeater                                                                              | 1 |
| Ans.16                                                                                                     | (A) Converts the analog signal to digital data                                            | 1 |
| Ans.17                                                                                                     | (C) Mesh                                                                                  | 1 |
| Ans.18                                                                                                     | (D) A is false but R is true                                                              | 1 |
| Ans.19                                                                                                     | (B) TCP/IP                                                                                | 1 |
| Ans.20                                                                                                     | (C) Cookies                                                                               | 1 |
| Ans.21                                                                                                     | (B) The unique address of a resource on the web                                           | 1 |
| Ans.22                                                                                                     | (C) Bus                                                                                   | 1 |
| Ans.23                                                                                                     | (B) VoIP                                                                                  | 1 |
| Ans.24                                                                                                     | (C) A is true but R is false                                                              | 1 |
| Ans.25                                                                                                     | (B) Web hosting                                                                           | 1 |
| Ans.26                                                                                                     | (D) Socket                                                                                | 1 |
| Ans.27                                                                                                     | (B) Plug-ins                                                                              | 1 |
| Ans.28                                                                                                     | (C) A is true but R is false                                                              | 1 |
| Ans.29                                                                                                     | (D) WAN                                                                                   | 1 |
| Ans.30                                                                                                     | (C) Dynamic                                                                               | 1 |
| <b>Section B</b>                                                                                           |                                                                                           |   |
| Q1                                                                                                         | Meera has built a website but doesn't know how visitors will actually reach it once it is | 2 |
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|                                                                                                            |                                                                                                                                                                                                                                                     |   |
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|                                                                                                            | finished. Explain the role of a web server in making her website accessible on the internet.                                                                                                                                                        |   |
| Q2                                                                                                         | What is meant by VoIP? State one advantage of using VoIP over a traditional telephone call.                                                                                                                                                         | 2 |
| Q3                                                                                                         | Differentiate between the Internet and the World Wide Web, giving one example of each.                                                                                                                                                              | 2 |
| Q4                                                                                                         | What are browser cookies? State one privacy concern associated with them.                                                                                                                                                                           | 2 |
| Q5                                                                                                         | Explain the terms Website and Web Page.                                                                                                                                                                                                             | 2 |
| Q6                                                                                                         | List any four goals or benefits of setting up a computer network.                                                                                                                                                                                   | 2 |
| Q7                                                                                                         | Differentiate between a web browser and a web server.                                                                                                                                                                                               | 2 |
| Q8                                                                                                         | Write one advantage and one disadvantage of tree topology.                                                                                                                                                                                          | 2 |
| Q9                                                                                                         | Write one function each for the following network devices: (i) Hub (ii) Gateway                                                                                                                                                                     | 2 |
| Q10                                                                                                        | Write one advantage and one disadvantage of mesh topology.                                                                                                                                                                                          | 2 |
| Q11                                                                                                        | Define the following terms: (i) Web Server (ii) Web Hosting                                                                                                                                                                                         | 2 |
| Q12                                                                                                        | Explain browser add-ons, and mention two examples of what they can do.                                                                                                                                                                              | 2 |
| Q13                                                                                                        | Give two points of difference between a static webpage and a dynamic webpage.                                                                                                                                                                       | 2 |
| Q14                                                                                                        | Describe the role of a switch in a network, and explain how it differs from a hub.                                                                                                                                                                  | 2 |
| Q15                                                                                                        | Expand URL. Identify the protocol and domain name in the following URL:<br><a href="http://www.ncert.nic.in/textbook.php?id=05">http://www.ncert.nic.in/textbook.php?id=05</a>                                                                      | 2 |
| Q16                                                                                                        | What is the primary function of a router? Explain briefly.                                                                                                                                                                                          | 2 |
| Q17                                                                                                        | Kabir believes that a "modem" and a "router" serve exactly the same purpose. Correct his understanding by explaining each device's role, with an example.                                                                                           | 2 |
| Q18                                                                                                        | Neha designed a personal blog on her home computer. What must she do so that people around the world can view it online?                                                                                                                            | 2 |
| Q19                                                                                                        | Aditya is building a webpage to display a live train-tracking map that updates every minute. Which type of webpage (static/dynamic) should he use, and why?                                                                                         | 2 |
| Q20                                                                                                        | Define the following terms: (a) Cookies (b) Bookmarks                                                                                                                                                                                               | 2 |
| <b>Answers — Section B</b>                                                                                 |                                                                                                                                                                                                                                                     |   |
| Ans.1                                                                                                      | A web server is a computer that stores a website's files and delivers them to a visitor's browser on request. Meera needs to have her files hosted on a web server, through a hosting service, so the site has a permanent address on the internet. | 2 |
| Ans.2                                                                                                      | VoIP (Voice over Internet Protocol) lets users make voice calls using an internet connection instead of a telephone line. One advantage is much lower call costs, especially for international calls.                                               | 2 |
| Ans.3                                                                                                      | The Internet is a global network of interconnected computers that exchange data, e.g.                                                                                                                                                               | 2 |
| <div> <div>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</div> <div>Page <b>144</b> of <b>183</b></div> </div> |                                                                                                                                                                                                                                                     |   |

|                                                                                                                   |                                                                                                                                                                                                                                                                       |   |
|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                                                                                                                   | sending an email. The World Wide Web is a collection of hyperlinked documents accessed over the Internet using a browser, e.g. browsing Wikipedia.                                                                                                                    |   |
| Ans.4                                                                                                             | Cookies are small text files a website stores on a user's device to remember logins and preferences. A privacy concern is that they can be used to track a user's browsing activity across different sites.                                                           | 2 |
| Ans.5                                                                                                             | A web page is a single document on the internet, identified by its own unique URL. A website is a collection of related web pages linked together and hosted under one domain.                                                                                        | 2 |
| Ans.6                                                                                                             | Resource sharing, cost reduction through shared hardware, reliable communication between users, and centralized management of data.                                                                                                                                   | 2 |
| Ans.7                                                                                                             | A web browser is software used to request and display web pages. A web server is the computer/system that stores those pages and delivers them whenever a browser requests them.                                                                                      | 2 |
| Ans.8                                                                                                             | Advantage: new branches can be added easily without disturbing the rest of the network. Disadvantage: if the root node fails, the branches beneath it lose connectivity to one another.                                                                               | 2 |
| Ans.9                                                                                                             | (i) A hub broadcasts incoming data to every device connected to it. (ii) A gateway connects two networks that use different protocols, translating data between them.                                                                                                 | 2 |
| Ans.10                                                                                                            | Advantage: highly reliable, since multiple paths exist if one link fails. Disadvantage: needs a very large amount of cabling, making it expensive.                                                                                                                    | 2 |
| Ans.11                                                                                                            | (i) A web server is a system that stores a website's files and delivers them to browsers on request. (ii) Web hosting is the service of storing those files on a server so the site is accessible on the internet.                                                    | 2 |
| Ans.12                                                                                                            | Add-ons are small programs that extend a browser's built-in functionality. Examples: an ad blocker that hides unwanted ads, or a password manager that auto-fills logins.                                                                                             | 2 |
| Ans.13                                                                                                            | A static webpage shows the same fixed content to every visitor and is built with plain HTML/CSS. A dynamic webpage generates its content on each request and can change based on user input or a database.                                                            | 2 |
| Ans.14                                                                                                            | A switch connects devices within a network and forwards data only to the port of the intended recipient, unlike a hub, which broadcasts to every device — making a switch faster and more secure.                                                                     | 2 |
| Ans.15                                                                                                            | URL stands for Uniform Resource Locator. In the given URL, the protocol is http and the domain is ncert.nic.in.                                                                                                                                                       | 2 |
| Ans.16                                                                                                            | A router connects two or more different networks and directs data packets along the most efficient path toward their destination.                                                                                                                                     | 2 |
| Ans.17                                                                                                            | A modem converts digital data from a computer into an analog signal for transmission (and back again), typically to connect to an ISP. A router then directs that data between networks or devices, e.g. sharing one internet connection across several home devices. | 2 |
| Ans.18                                                                                                            | Neha must publish her blog's files to a web server through a web hosting service, which                                                                                                                                                                               | 2 |
| <p><b>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</b> <span style="float: right;"><b>Page 145 of 183</b></span></p> |                                                                                                                                                                                                                                                                       |   |

|                                                | gives it a permanent address accessible over the internet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|-------------|------|-----------|------|---------------|-------|-----------|------|---------------|------|-------------|------|---------------|-----------|-------|----|-------|----|-----|----|---------|----|--------------|----|---|
| Ans.19                                         | Aditya should use a dynamic webpage, since the train positions must be updated automatically on each request rather than staying fixed like static content.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2       |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Ans.20                                         | (a) Cookies are small text files a website stores on a device to remember user data and preferences. (b) Bookmarks are shortcuts a user saves in a browser to quickly revisit a favourite webpage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2       |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Section C — Case Study / Long Answer Questions |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Q1                                             | <p>TechNova Solutions has its head office in Chennai, organized into four departments — Admin, Sales, Dev and Support — and a branch office in Kochi, 685 km away.</p> <table> <tr> <th>From-To</th> <th>Distance</th> </tr> <tr> <td>Admin-Sales</td> <td>55 m</td> </tr> <tr> <td>Admin-Dev</td> <td>95 m</td> </tr> <tr> <td>Admin-Support</td> <td>130 m</td> </tr> <tr> <td>Sales-Dev</td> <td>60 m</td> </tr> <tr> <td>Sales-Support</td> <td>75 m</td> </tr> <tr> <td>Dev-Support</td> <td>50 m</td> </tr> <tr> <th>Dept / Office</th> <th>Computers</th> </tr> <tr> <td>Admin</td> <td>95</td> </tr> <tr> <td>Sales</td> <td>45</td> </tr> <tr> <td>Dev</td> <td>80</td> </tr> <tr> <td>Support</td> <td>20</td> </tr> <tr> <td>Kochi Branch</td> <td>35</td> </tr> </table> <p>(i) Suggest the department in which the server should be installed, with reason.<br/> (ii) Suggest and draw a suitable cable layout to connect the four departments.<br/> (iii) Which device would you suggest to interconnect the computers within a department?<br/> (iv) Which type of network (LAN/MAN/WAN) will connect the Chennai head office with the Kochi branch? Justify.<br/> (v) The signal weakens noticeably between Admin and Support. Which device should be used to fix this?</p> | From-To | Distance | Admin-Sales | 55 m | Admin-Dev | 95 m | Admin-Support | 130 m | Sales-Dev | 60 m | Sales-Support | 75 m | Dev-Support | 50 m | Dept / Office | Computers | Admin | 95 | Sales | 45 | Dev | 80 | Support | 20 | Kochi Branch | 35 | 5 |
| From-To                                        | Distance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Admin-Sales                                    | 55 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Admin-Dev                                      | 95 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Admin-Support                                  | 130 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Sales-Dev                                      | 60 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Sales-Support                                  | 75 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Dev-Support                                    | 50 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Dept / Office                                  | Computers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Admin                                          | 95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Sales                                          | 45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Dev                                            | 80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Support                                        | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Kochi Branch                                   | 35                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |         |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |
| Q2                                             | Global Retail Corp's head office in Ahmedabad has four departments — Purchase, Inventory, Finance and HR — and a regional office in Surat, 270 km away.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 5       |          |             |      |           |      |               |       |           |      |               |      |             |      |               |           |       |    |       |    |     |    |         |    |              |    |   |

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|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                     |           |
|                                                                                               | From-To                                                                                                                                                                                                                                                                                                                                                                                                             | Distance  |
|                                                                                               | Purchase-Inventory                                                                                                                                                                                                                                                                                                                                                                                                  | 48 m      |
|                                                                                               | Purchase-Finance                                                                                                                                                                                                                                                                                                                                                                                                    | 70 m      |
|                                                                                               | Purchase-HR                                                                                                                                                                                                                                                                                                                                                                                                         | 40 m      |
|                                                                                               | Inventory-Finance                                                                                                                                                                                                                                                                                                                                                                                                   | 65 m      |
|                                                                                               | Inventory-HR                                                                                                                                                                                                                                                                                                                                                                                                        | 85 m      |
|                                                                                               | Finance-HR                                                                                                                                                                                                                                                                                                                                                                                                          | 55 m      |
|                                                                                               | Dept / Office                                                                                                                                                                                                                                                                                                                                                                                                       | Computers |
|                                                                                               | Purchase                                                                                                                                                                                                                                                                                                                                                                                                            | 60        |
|                                                                                               | Inventory                                                                                                                                                                                                                                                                                                                                                                                                           | 140       |
|                                                                                               | Finance                                                                                                                                                                                                                                                                                                                                                                                                             | 35        |
|                                                                                               | HR                                                                                                                                                                                                                                                                                                                                                                                                                  | 20        |
|                                                                                               | Surat Office                                                                                                                                                                                                                                                                                                                                                                                                        | 30        |
|                                                                                               | (i) Suggest the department for placing the server, with reason.<br>(ii) Suggest and draw a suitable cable layout for the Ahmedabad office.<br>(iii) Which device should interconnect the computers within a department?<br>(iv) Which type of network (LAN/MAN/WAN) connects Ahmedabad with Surat?<br>(v) The company wants an online order-tracking portal for customers. Should it be static or dynamic? Justify. |           |
| Q3                                                                                            | BrightMinds EdTech's Pune campus has four blocks — Admin, Curriculum, Exam and Result — with its head office in Nashik, 210 km away.                                                                                                                                                                                                                                                                                |           |
|                                                                                               | From-To                                                                                                                                                                                                                                                                                                                                                                                                             | Distance  |
|                                                                                               | Admin-Curriculum                                                                                                                                                                                                                                                                                                                                                                                                    | 60 m      |
|                                                                                               | Admin-Exam                                                                                                                                                                                                                                                                                                                                                                                                          | 85 m      |
|                                                                                               | Admin-Result                                                                                                                                                                                                                                                                                                                                                                                                        | 45 m      |
|                                                                                               | Curriculum-Exam                                                                                                                                                                                                                                                                                                                                                                                                     | 55 m      |
|                                                                                               | Curriculum-Result                                                                                                                                                                                                                                                                                                                                                                                                   | 65 m      |
| <div>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</div> <div>Page <b>147</b> of <b>183</b></div> |                                                                                                                                                                                                                                                                                                                                                                                                                     |           |

|                |           |
|----------------|-----------|
| Exam-Result    | 40 m      |
| Block / Office | Computers |
| Admin          | 100       |
| Curriculum     | 65        |
| Exam           | 38        |
| Result         | 15        |
| Nashik HO      | 25        |

- (i) Suggest the block for placing the server, with reason.  
(ii) Suggest and draw a suitable cable layout for the Pune campus.  
(iii) Which device should interconnect computers within a block?  
(iv) Students will view personalized results after logging in. Should the results website be static or dynamic?  
(v) Which of the following should be used for face-to-face communication between Pune and Nashik? (a) Cable TV (b) Email (c) Video conferencing (d) Text chat

|    |                                                                                                                    |           |   |
|----|--------------------------------------------------------------------------------------------------------------------|-----------|---|
| Q4 | NextGen Robotics' Bengaluru branch has four sections — Research, Design, Assembly and QA — all on a single campus. |           | 5 |
|    | From-To                                                                                                            | Distance  |   |
|    | Research-Design                                                                                                    | 45 m      |   |
|    | Research-Assembly                                                                                                  | 90 m      |   |
|    | Research-QA                                                                                                        | 70 m      |   |
|    | Design-Assembly                                                                                                    | 60 m      |   |
|    | Design-QA                                                                                                          | 85 m      |   |
|    | Assembly-QA                                                                                                        | 50 m      |   |
|    | Section                                                                                                            | Computers |   |
|    | Research                                                                                                           | 55        |   |
|    | Design                                                                                                             | 40        |   |
|    | Assembly                                                                                                           | 130       |   |
|    | QA                                                                                                                 | 25        |   |

|         | <p>(i) Suggest the topology and draw the most suitable cable layout for connecting all sections.</p> <p>(ii) What type of network (LAN/MAN/WAN) is created when Research connects directly to Design? Justify.</p> <p>(iii) Suggest the section for placement of the server, with reason.</p> <p>(iv) Suggest the placement of the switch/hub, with justification.</p> <p>(v) Employees frequently use VoIP to speak with overseas clients. What is the full form of VoIP?</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|----------|-------|------|-------|------|-------|------|-------|------|-------|-------|-------|------|-------|-----------|----|-----|----|-----|----|-----|----|----|---|
| Q5      | <p>Skyline Media's Delhi campus has four blocks — D1, D2, D3 and D4.</p> <table> <tr> <th>From-To</th> <th>Distance</th> </tr> <tr> <td>D1-D2</td> <td>70 m</td> </tr> <tr> <td>D1-D3</td> <td>55 m</td> </tr> <tr> <td>D1-D4</td> <td>95 m</td> </tr> <tr> <td>D2-D3</td> <td>40 m</td> </tr> <tr> <td>D2-D4</td> <td>110 m</td> </tr> <tr> <td>D3-D4</td> <td>60 m</td> </tr> <tr> <th>Block</th> <th>Computers</th> </tr> <tr> <td>D1</td> <td>150</td> </tr> <tr> <td>D2</td> <td>260</td> </tr> <tr> <td>D3</td> <td>175</td> </tr> <tr> <td>D4</td> <td>90</td> </tr> </table> <p>(i) Suggest the block for placing the server, with reason.</p> <p>(ii) Suggest a suitable topology for fast, efficient connections and draw it.</p> <p>(iii) Suggest the placement of: (a) a repeater (b) a hub/switch, with justification.</p> <p>(iv) VoIP is to be used for voice calls over broadband. Expand the term VoIP.</p> <p>(v) Skyline Media plans to link its Delhi and Mumbai centers. Which network type (LAN/MAN/WAN) will this create?</p> |  | From-To | Distance | D1-D2 | 70 m | D1-D3 | 55 m | D1-D4 | 95 m | D2-D3 | 40 m | D2-D4 | 110 m | D3-D4 | 60 m | Block | Computers | D1 | 150 | D2 | 260 | D3 | 175 | D4 | 90 | 5 |
| From-To | Distance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D1-D2   | 70 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D1-D3   | 55 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D1-D4   | 95 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D2-D3   | 40 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D2-D4   | 110 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D3-D4   | 60 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| Block   | Computers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D1      | 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D2      | 260                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D3      | 175                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| D4      | 90                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| Q6      | <p>Vertex Software Pvt. Ltd., Hyderabad, has four divisions — V1, V2, V3, V4 — and a branch office in Toronto.</p> <table> <tr> <th>From-To</th> <th>Distance</th> </tr> <tr> <td>V1-V2</td> <td>80 m</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | From-To | Distance | V1-V2 | 80 m | 5     |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| From-To | Distance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |
| V1-V2   | 80 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |         |          |       |      |       |      |       |      |       |      |       |       |       |      |       |           |    |     |    |     |    |     |    |    |   |

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|          |           |
|----------|-----------|
| V1-V3    | 130 m     |
| V1-V4    | 75 m      |
| V2-V3    | 95 m      |
| V2-V4    | 60 m      |
| V3-V4    | 150 m     |
| Division | Computers |
| V1       | 90        |
| V2       | 200       |
| V3       | 140       |
| V4       | 110       |

- (i) Suggest the topology and draw the most suitable cable layout for the Hyderabad office.  
(ii) Which type of network (LAN/MAN/WAN) connects Hyderabad with Toronto? Justify.  
(iii) Suggest the division for placement of the server, with reason.  
(iv) Suggest the placement of the switch/hub, with justification.  
(v) Which protocol would help a remote employee with voice transmission over the network?

|    |                                                                                                                                                              |           |   |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---|
| Q7 | Coastal Foods Pvt. Ltd.'s Kochi branch has four divisions — Procurement, Packaging, Quality Control (QC) and Dispatch — and its head office is in Singapore. |           | 5 |
|    | From-To                                                                                                                                                      | Distance  |   |
|    | Procurement-Packaging                                                                                                                                        | 65 m      |   |
|    | Procurement-QC                                                                                                                                               | 85 m      |   |
|    | Procurement-Dispatch                                                                                                                                         | 100 m     |   |
|    | Packaging-QC                                                                                                                                                 | 55 m      |   |
|    | Packaging-Dispatch                                                                                                                                           | 70 m      |   |
|    | QC-Dispatch                                                                                                                                                  | 45 m      |   |
|    | Division                                                                                                                                                     | Computers |   |
|    | Procurement                                                                                                                                                  | 70        |   |

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|-----------------|------|---------------|-------|-------------------|------|-----------|------|---------------|------|-------------|------|----------|-----------|-----------|-----|-------|----|-----|----|---------|----|---|
|                   | <table><tr><td>Packaging</td><td>155</td></tr><tr><td>QC</td><td>45</td></tr><tr><td>Dispatch</td><td>30</td></tr></table> <p>(i) Suggest the division for placement of the server, with reason.<br/>(ii) Suggest and draw a suitable cable layout for the Kochi branch.<br/>(iii) Which device should interconnect computers within a division?<br/>(iv) Which type of network (LAN/MAN/WAN) connects Kochi with Singapore? Justify.<br/>(v) Which device connects the Kochi network to the internet, receiving data, analyzing it, and forwarding it onward?</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Packaging | 155      | QC              | 45   | Dispatch      | 30    |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Packaging         | 155                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| QC                | 45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Dispatch          | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Q8                | <p>Zenith Analytics, Chennai, has four divisions — Analytics, Sales, Ops and Support — and a head office in London.</p> <table><tr><td>From–To</td><td>Distance</td></tr><tr><td>Analytics–Sales</td><td>60 m</td></tr><tr><td>Analytics–Ops</td><td>140 m</td></tr><tr><td>Analytics–Support</td><td>90 m</td></tr><tr><td>Sales–Ops</td><td>75 m</td></tr><tr><td>Sales–Support</td><td>50 m</td></tr><tr><td>Ops–Support</td><td>65 m</td></tr><tr><td>Division</td><td>Computers</td></tr><tr><td>Analytics</td><td>180</td></tr><tr><td>Sales</td><td>65</td></tr><tr><td>Ops</td><td>40</td></tr><tr><td>Support</td><td>30</td></tr></table> <p>(i) Suggest the topology and draw the most suitable cable layout for the Chennai office.<br/>(ii) Which type of network (LAN/MAN/WAN) connects Chennai with London? Justify.<br/>(iii) Suggest the division for placement of the server, with reason.<br/>(iv) Suggest the placement of the switch/hub, with justification.<br/>(v) Where should a repeater be placed in this layout? Justify.</p> | From–To   | Distance | Analytics–Sales | 60 m | Analytics–Ops | 140 m | Analytics–Support | 90 m | Sales–Ops | 75 m | Sales–Support | 50 m | Ops–Support | 65 m | Division | Computers | Analytics | 180 | Sales | 65 | Ops | 40 | Support | 30 | 5 |
| From–To           | Distance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Analytics–Sales   | 60 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Analytics–Ops     | 140 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Analytics–Support | 90 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Sales–Ops         | 75 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Sales–Support     | 50 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Ops–Support       | 65 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Division          | Computers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Analytics         | 180                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Sales             | 65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Ops               | 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Support           | 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |
| Q9                | Horizon Apparel, Jaipur, has four divisions — J1, J2, J3, J4 — and is opening a new office in                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5         |          |                 |      |               |       |                   |      |           |      |               |      |             |      |          |           |           |     |       |    |     |    |         |    |   |

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| Kolkata.                                                                                                                                                                                                                                                                                                                                                                                                                          |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| From-To                                                                                                                                                                                                                                                                                                                                                                                                                           | Distance  |
| J1-J2                                                                                                                                                                                                                                                                                                                                                                                                                             | 58 m      |
| J1-J3                                                                                                                                                                                                                                                                                                                                                                                                                             | 120 m     |
| J1-J4                                                                                                                                                                                                                                                                                                                                                                                                                             | 66 m      |
| J2-J3                                                                                                                                                                                                                                                                                                                                                                                                                             | 80 m      |
| J2-J4                                                                                                                                                                                                                                                                                                                                                                                                                             | 95 m      |
| J3-J4                                                                                                                                                                                                                                                                                                                                                                                                                             | 105 m     |
| Division                                                                                                                                                                                                                                                                                                                                                                                                                          | Computers |
| J1                                                                                                                                                                                                                                                                                                                                                                                                                                | 120       |
| J2                                                                                                                                                                                                                                                                                                                                                                                                                                | 75        |
| J3                                                                                                                                                                                                                                                                                                                                                                                                                                | 200       |
| J4                                                                                                                                                                                                                                                                                                                                                                                                                                | 50        |
| (i) Suggest the topology and draw the most suitable cable layout for the Jaipur divisions.<br>(ii) Which type of network (LAN/MAN/WAN) connects Jaipur with Kolkata?<br>(iii) Suggest the division for placement of the server, with reason.<br>(iv) Suggest the placement of: (a) a repeater (b) a hub/switch, with justification.<br>(v) Name any two tools that can be used to extend or modify a web browser's functionality. |           |

|     |                                                                                                                                          |          |   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------|----------|---|
| Q10 | Vantage Logistics' head office in Bhopal has four divisions — L1, L2, L3, L4 — and a warehouse facility 14 km away within the same city. |          | 5 |
|     | From-To                                                                                                                                  | Distance |   |
|     | L1-L2                                                                                                                                    | 50 m     |   |
|     | L1-L3                                                                                                                                    | 85 m     |   |
|     | L1-L4                                                                                                                                    | 60 m     |   |
|     | L2-L3                                                                                                                                    | 70 m     |   |
|     | L2-L4                                                                                                                                    | 95 m     |   |

|                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |   |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---|
|                                                                                                            | L3-L4                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 55 m      |   |
|                                                                                                            | Division                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Computers |   |
|                                                                                                            | L1                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 130       |   |
|                                                                                                            | L2                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 45        |   |
|                                                                                                            | L3                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 60        |   |
|                                                                                                            | L4                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 25        |   |
|                                                                                                            | (i) Suggest the topology and draw the most suitable cable layout for the Bhopal divisions.<br>(ii) Which type of network (LAN/MAN/WAN) connects the head office with the warehouse, 14 km away in the same city? Justify.<br>(iii) Suggest the division for placement of the server, with reason.<br>(iv) Suggest the placement of the switch/hub, with justification.<br>(v) Which protocol would be used for a voice call between the head office and warehouse teams? |           |   |
| Answers — Section C                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |   |
| Ans.1                                                                                                      | Admin, as it has the most computers (95).<br>Star layout with Admin as the central node connecting to Sales, Dev and Support.<br>A switch.<br>WAN, since Chennai and Kochi are 685 km apart.<br>A repeater, to boost the signal over the 130 m Admin-Support run.                                                                                                                                                                                                        |           | 5 |
| Ans.2                                                                                                      | Inventory, as it has the most computers (140).<br>Star layout with Inventory as the central node.<br>A switch.<br>WAN, since Ahmedabad and Surat are 270 km apart.<br>A dynamic website, so customers can log in and see live, personalised order status.                                                                                                                                                                                                                |           | 5 |
| Ans.3                                                                                                      | Admin, as it has the most computers (100).<br>Star layout with Admin as the central node.<br>A switch.<br>Dynamic, since results are personalised per student login.<br>Video conferencing.                                                                                                                                                                                                                                                                              |           | 5 |
| Ans.4                                                                                                      | Star topology, with all sections wired to a central switch.<br>LAN, since Research and Design sit on the same campus.                                                                                                                                                                                                                                                                                                                                                    |           | 5 |
| <div> <div>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</div> <div>Page <b>153</b> of <b>183</b></div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |   |

|                                                                                                                   |                                                                                                                                                                                                                                                                                                  |   |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                                                                                                                   | <p>Assembly, as it has the most computers (130).</p> <p>The switch/hub should sit in Assembly, alongside the server.</p> <p>Voice over Internet Protocol.</p>                                                                                                                                    |   |
| Ans.5                                                                                                             | <p>D2, as it has the most computers (260).</p> <p>Star topology with D2 at the centre. (</p> <p>(a) A repeater between D2 and D4 (the longest run, 110 m). (b) A hub/switch in D2.</p> <p>Voice over Internet Protocol.</p> <p>WAN, as Delhi and Mumbai are different cities far apart.</p>      | 5 |
| Ans.6                                                                                                             | <p>Star topology with a central switch connecting V1–V4. (ii)</p> <p>WAN, since Hyderabad and Toronto are in different countries.</p> <p>V2, as it has the most computers (200).</p> <p>The switch/hub should be placed in V2.</p> <p>VoIP.</p>                                                  | 5 |
| Ans.7                                                                                                             | <p>Packaging, as it has the most computers (155).</p> <p>Star layout with Packaging as the central node.</p> <p>A switch.</p> <p>WAN, since Kochi and Singapore are in different countries.</p> <p>A router.</p>                                                                                 | 5 |
| Ans.8                                                                                                             | <p>Star topology with Analytics as the central node.</p> <p>WAN, since Chennai and London are in different countries.</p> <p>Analytics, as it has the most computers (180).</p> <p>The switch/hub should be placed in Analytics.</p> <p>Between Analytics and Ops, the longest run at 140 m.</p> | 5 |
| Ans.9                                                                                                             | <p>Star topology with J3 as the central node.</p> <p>WAN, since Jaipur and Kolkata are different, distant cities.</p> <p>J3, as it has the most computers (200).</p> <p>(a) A repeater between J1 and J3 (120 m, the longest run). (b) A hub/switch in J3.</p> <p>Plug-ins and Add-ons.</p>      | 5 |
| <p><b>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</b> <span style="float: right;"><b>Page 154 of 183</b></span></p> |                                                                                                                                                                                                                                                                                                  |   |

|        |                                                                                                                                                                                                                                  |   |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|        |                                                                                                                                                                                                                                  |   |
| Ans.10 | <p>Star topology with L1 as the central node.</p> <p>MAN, since the warehouse is 14 km away, within the same city.</p> <p>L1, as it has the most computers (130).</p> <p>The switch/hub should be placed in L1.</p> <p>VoIP.</p> | 5 |

### TOPIC: SOCIETAL IMPACTS

#### Question Type: MCQ (Multiple Choice Questions)

| QN | Questions                                                                                                                                                                                                                                                                                                                                                                                                                | Marks |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1 | <p>Shruti received an email that appeared to be from a popular social media platform, requesting her to click a link to reset her password. The link directed her to a fraudulent website designed to capture her login credentials. This situation is an example of which type of cybercrime?</p> <p>(A) Cyber Bullying</p> <p>(B) Violation of Intellectual Property Rights</p> <p>(C) Hacking</p> <p>(D) Phishing</p> | 1     |
| Q2 | <p>Aarushi has written a novel and wants to protect her literary work. Which type of Intellectual Property right will help her do that?</p> <p>(A) Patent</p> <p>(B) Copyright</p> <p>(C) Trademark</p> <p>(D) Both Copyright &amp; Trademark</p>                                                                                                                                                                        | 1     |
| Q3 | <p>In India, the primary law that deals e-commerce and cybercrime is _____.</p> <p>(A) Cybercrime Prevention Act, 2000</p> <p>(B) Digital Security Act, 2000</p>                                                                                                                                                                                                                                                         | 1     |

|    |                                                                                                                                                                                                                                                                                         |   |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|    | (C) Information Technology Act, 2000<br>(D) E-Commerce Regulation Act, 2008                                                                                                                                                                                                             |   |
| Q4 | E-waste refers to:<br>(A) Software that has become obsolete<br>(B) Data that has been deleted from a storage device<br>(C) Viruses that infect computers<br>(D) Electronic devices that are no longer in use                                                                            | 1 |
| Q5 | What is plagiarism?<br>(A) Using copyrighted material without giving proper acknowledgement to the source<br>(B) Downloading illegal software.<br>(C) Spreading misinformation online.<br>(D) Hacking into computer systems.                                                            | 1 |
| Q6 | Identify the type of cybercrime that involves sending fraudulent emails to deceive individuals into revealing sensitive information.<br>(A) Hacking<br>(B) Phishing<br>(C) Cyberbullying<br>(D) Cyberstalking                                                                           | 1 |
| Q7 | Copyright, Patent and Trademark comes under:<br>(A) Intellectual Property Right<br>(B) Individual Property Right<br>(C) Industrial Property Right<br>(D) International Property Right                                                                                                   | 1 |
| Q8 | When e-waste such as electronic circuit boards are burnt for disposal, the elements contained in them create a harmful chemical called _____ which causes skin diseases, allergies and an increased risk of lung cancer.<br>(A) Hydrogen<br>(B) Beryllium<br>(C) Chlorine<br>(D) Oxygen | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                   |   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Q9  | _____ is not a FOSS tool.<br>(A) Libre Office<br>(B) Mozilla Firefox<br>(C) Google Chrome<br>(D) Python                                                                                                                                                                                                                                                                                                           | 1 |
| Q10 | By restricting the server and encrypting the data, a software company's server is unethically accessed in order to obtain sensitive information. The attacker blackmails the company to pay money for getting access to the data, and threatens to publish sensitive information unless price is paid. This kind of attack is known as:<br>(A) Phishing<br>(B) Identity Theft<br>(C) Plagiarism<br>(D) Ransomware | 1 |
| Q11 | _____ is a non-profit organization that aims to build a publicly accessible global platform where a range of creative and academic work is shared freely.<br>(A) Creative Cost<br>(B) Critical Commons<br>(C) Creative Commons<br>(D) Creative Common                                                                                                                                                             | 1 |
| Q12 | Which of the following is not a type of cyber crime?<br>(A) Data theft<br>(B) Installing antivirus for protection<br>(C) Forgery<br>(D) Cyber bullying                                                                                                                                                                                                                                                            | 1 |
| Q13 | What is an example of e-waste?<br>(A) A ripened mango<br>(B) Unused old shoes<br>(C) Unused old computers<br>(D) Empty cola cans                                                                                                                                                                                                                                                                                  | 1 |
| Q14 | 'O' in FOSS stands for:                                                                                                                                                                                                                                                                                                                                                                                           | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                |   |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (A) Outsource<br>(B) Open<br>(C) Original<br>(D) Outstanding                                                                                                                                                                                                                                                                                                                   |   |
| Q15 | Legal term to describe the rights of a creator of original creative or artistic work is:<br>(A) Copyright<br>(B) Copyleft<br>(C) GPL<br>(D) FOSS                                                                                                                                                                                                                               | 1 |
| Q16 | _____ is the trail of data we leave behind when we visit any website (or use any online application or portal) to fill-in data or perform any transaction.<br>(A) Offline phishing<br>(B) Offline footprint<br>(C) Digital footprint<br>(D) Digital phishing                                                                                                                   | 1 |
| Q17 | The fraudulent act of obtaining the personal information of another person to commit online fraud, is called :<br>(A) Copyright Infringement<br>(B) Plagiarism<br>(C) Cyberbullying<br>(D) Identity Theft                                                                                                                                                                      | 1 |
| Q18 | Which of the following statements is true about Copyright?<br>(A) Copyright allows anyone to use, modify, and distribute a work without restrictions.<br>(B) Copyright grants exclusive legal rights to the owner to copy, distribute, or create derivative of creative work.<br>(C) Copyright applies only to written books.<br>(D) Copyright does not cover digital content. | 1 |
| Q19 | Which of the following is a potential hazard associated with e-waste disposal?<br>(A) Phishing<br>(B) Spread of computer virus                                                                                                                                                                                                                                                 | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (C) Decrease in computer performance<br>(D) Pollution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |
| Q20 | Which out of the following cannot be included in digital footprint ?<br>(A) Submitting the form online<br>(B) Searching for your friend's address online<br>(C) Walking on the beach<br>(D) Online shopping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1 |
| Q21 | Emma is a student working on her research project. She finds a well-written paragraph on the Internet that perfectly explains the concept that she wants to include in her project. She copies and pastes the paragraph as it is into her research paper. Her research paper did not get selected due to plagiarism. What is the one way out of the following that Emma could have followed to avoid plagiarism in this case ?<br>(A) Copying the content from a book in her college library.<br>(B) Rewriting the paragraph in her own words and citing the original source.<br>(C) Asking her friends for information and using it in her research paper, without mentioning her friend's input.<br>(D) Posting the paper on her college website. | 1 |
| Q22 | For how long does a patent typically protect an invention ?<br>(A) 5 years<br>(B) 10 years<br>(C) 20 years<br>(D) 50 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1 |
| Q23 | Which of the following is not a feature of Open Source Software ?<br>(A) It can be shared with others without any licensing burden.<br>(B) It is same as free software.<br>(C) It can be downloaded on multiple devices.<br>(D) Its source code is available for free distribution.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1 |
| Q24 | What is a common symptom of extended use of digital devices these days ?<br>(A) Improved eyesight<br>(B) Enhanced physical fitness                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (C) Eye strain<br>(D) Increased muscle strength                                                                                                                                                                                                                                                                                                                                                                                                                           |   |
| Q25 | Assertion (A) : Hacking is a cyber crime.<br>Reason (R) : To avoid hacking, one should not share the password with anyone.<br>(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).<br>(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).<br>(C) Assertion (A) is true, but Reason (R) is false.<br>(D) Assertion (A) is false, but Reason (R) is true. | 1 |
| Q26 | We need to exhibit proper manners and etiquettes while being online. Pick up one such net etiquette from the following :<br>(A) Do not share the expertise<br>(B) Respect privacy and diversity<br>(C) Feed the troll<br>(D) Copyright violation                                                                                                                                                                                                                          | 1 |
| Q27 | A patent protects an invention for _____ years, after which it can be freely used.<br>(A) 40<br>(B) 30<br>(C) 20<br>(D) 10                                                                                                                                                                                                                                                                                                                                                | 1 |
| Q28 | E-waste contains _____ that causes respiratory disorders and brain damage.<br>(A) Cadmium<br>(B) Beryllium<br>(C) Lead<br>(D) Mercury                                                                                                                                                                                                                                                                                                                                     | 1 |
| Q29 | Rupam created an assistive device for the blind. This device is very helpful for the blind and people with low vision. Now, she wants that no one should copy her innovation. What should she do ?<br>(A) Get the trademark for her invention                                                                                                                                                                                                                             | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                          |   |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (B) Get the license for her invention<br>(C) Get the patent for her invention<br>(D) Get the copyright for her invention                                                                                                                                                                                                                                                 |   |
| Q30 | Presenting someone else's idea or work as one's own idea or work is called :<br>(A) Phishing<br>(B) Stacking<br>(C) Plagiarism<br>(D) Bullying                                                                                                                                                                                                                           | 1 |
| Q31 | Raheem created a unique computer software and wants to protect his creation from being copied or used without his permission. He is considering to apply for legal protection. Which type of intellectual property protection should Raheem apply for, to safeguard his software ? (A) Copyright<br>(B) Plagiarism<br>(C) Trademark<br>(D) Lease                         | 1 |
| Q32 | Priya received an email that appeared to be from her bank, asking her to update her account information by clicking on a link. She clicked the link to enter her details, but immediately after, some amount was debited from her account. What type of cybercrime did Priya fall victim to ?<br>(A) Cyber stalking<br>(B) Phishing<br>(C) Fishing<br>(D) Cyber bullying | 1 |
| Q33 | Excessive screen time and poor posture can lead to :<br>(A) Faster Internet Speeds<br>(B) Eye strain and other health issues<br>(C) Better vision and bone density<br>(D) Improved physical health                                                                                                                                                                       | 1 |
| Q34 | Ridhima purchased a license for a copy of a software and made additional copies without the permission of the copyright owner. This act of hers is known as _____.                                                                                                                                                                                                       | 1 |

|     |                                                                                                                                                                                                                                                                                                                 |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (A) Trademark Infringement<br>(B) Identity Theft<br>(C) Copyright Infringement<br>(D) Patent                                                                                                                                                                                                                    |   |
| Q35 | What can an individual do to enhance the privacy of data stored digitally ?<br>(A) Share sensitive information on social media platforms.<br>(B) Use your date of birth as your password.<br>(C) Regularly update software installed on your device.<br>(D) Download and install software from unknown sources. | 1 |
| Q36 | _____ is the gaining of unauthorized access to data in a computer system.<br>(A) Phishing<br>(B) Plagiarism<br>(C) Hacking<br>(D) Copyright violation                                                                                                                                                           | 1 |
| Q37 | Rama was unable to understand how the recruiters were able to know about her digital activity when she has not shared anything with them. The recruiters might have checked _____ of Rama.<br>(A) Carbon Footprint<br>(B) Water Footprint<br>(C) Online print<br>(D) Digital Footprint                          | 1 |
| Q38 | The software that is free for anyone, and its source code is available for access, modification, correction, and improvement is called _____.<br>(A) Proprietary software<br>(B) Commercial software<br>(C) Free and Open source software<br>(D) Copyrighted software                                           | 1 |
| Q39 | _____ help in data protection through copyrights, patents and trademarks.<br>(A) Data Privacy Right<br>(B) Right to Innovation                                                                                                                                                                                  | 1 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                            |   |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (C) Intellectual Property Rights (IPR)<br>(D) Right to Data Protection                                                                                                                                                                                                                                                                                                                                                     |   |
| Q40 | Assertion (A) : Cyber Bullying can have serious, emotional and psychological effects on victims.<br>Reason (R) : Online Bullying is not a crime while offline bullying is a crime.<br>(A) Both (A) and (R) are true and (R) is the correct explanation for (A).<br>(B) Both (A) and (R) are true and (R) is not the correct explanation for (A).<br>(C) (A) is true and (R) is false.<br>(D) (A) is false but (R) is true. | 1 |
| Q41 | Ramandeep is a young woman with great aspirations and has a good team of like-minded people. She along with her team members started a company to sell handicrafts online and also designed a logo for their company. What type of intellectual property does this logo represent ?<br>(A) Patents<br>(B) Copyright<br>(C) Design<br>(D) Trademark                                                                         | 1 |
| Q42 | Which of the following is a type of cybercrime where objectionable and demeaning comments are posted on social media platform about a person, such that he/she is mentally harassed ?<br>(A) Phishing<br>(B) Hacking<br>(C) Cyber bullying<br>(D) Identity Theft                                                                                                                                                           | 1 |
| Q43 | Primary law in India for matters related to e-commerce and cyber crime is :<br>(A) IT Act 1995<br>(B) IT Act 2000<br>(C) IT Act 1998<br>(D) IT Act 2010                                                                                                                                                                                                                                                                    | 1 |
| Q44 | The digital footprint that we leave online unintentionally is called                                                                                                                                                                                                                                                                                                                                                       | 1 |

|     |                                                                                                                                                                                                                                                    |   |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | (A) Active digital footprint<br>(B) Passive digital footprint<br>(C) True digital footprint<br>(D) False digital footprint                                                                                                                         |   |
| Q45 | E-waste is responsible for the degradation of our environment if not properly treated or disposed of. Some of the feasible methods of e-waste management are reduce, _____ and recycle.<br>(A) reuse<br>(B) recheck<br>(C) resubmit<br>(D) regular | 1 |

**Answers:**

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Q1  | Q2  | Q3  | Q4  | Q5  | Q6  | Q7  | Q8  | Q9  | Q10 |
| D   | B   | C   | D   | A   | B   | A   | B   | C   | D   |
| Q11 | Q12 | Q13 | Q14 | Q15 | Q16 | Q17 | Q18 | Q19 | Q20 |
| C   | B   | C   | B   | A   | C   | D   | B   | D   | C   |
| Q21 | Q22 | Q3  | Q24 | Q25 | Q26 | Q27 | Q28 | Q29 | Q30 |
| B   | C   | B   | C   | A   | B   | C   | C   | C   | C   |
| Q31 | Q32 | Q33 | Q34 | Q35 | Q36 | Q37 | Q38 | Q39 | Q40 |
| A   | B   | B   | C   | C   | C   | D   | C   | C   | C   |
| Q41 | Q42 | Q43 | Q44 | Q45 |     |     |     |     |     |
| D   | C   | B   | B   | A   |     |     |     |     |     |

**Question Type: Short Answer (Type-1)**

| <b>QN</b> | <b>Questions</b>                                                                                                                                                                                                                                                                                                                                                                               | <b>Marks</b> |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Q1        | What is e-waste? Mention any one impact of e-waste on the environment.                                                                                                                                                                                                                                                                                                                         | 2            |
| Q2        | Define digital footprints. Differentiate between active and passive digital footprints.                                                                                                                                                                                                                                                                                                        | 2            |
| Q3        | What are intellectual property rights (IPR), and why are they important in the digital world?                                                                                                                                                                                                                                                                                                  | 2            |
| Q4        | Mention two health concerns associated with excessive use of Digital Devices.                                                                                                                                                                                                                                                                                                                  | 2            |
| Q5        | List any four benefits of e-waste management.                                                                                                                                                                                                                                                                                                                                                  | 2            |
| Q6        | Mention any four net etiquettes.                                                                                                                                                                                                                                                                                                                                                               | 2            |
| Q7        | Mention any two health concerns associated with excessive usage of technology.                                                                                                                                                                                                                                                                                                                 | 2            |
| Q8        | What is a digital footprint ? Also, provide two examples of how it's created.                                                                                                                                                                                                                                                                                                                  | 2            |
| Q9        | What do you understand by Copyright Infringement ? What can be done as a user to avoid Copyright Infringement ?                                                                                                                                                                                                                                                                                | 2            |
| Q10       | What is meant by Trademark Infringement ? What action can the owner take against someone who infringes its registered trademark ?                                                                                                                                                                                                                                                              | 2            |
| Q11       | <p>A small tech startup, is considering using open source software to develop their new project management tool. They are evaluating the benefits and potential challenges of adopting open source solutions.</p> <p>(i) Identify one key benefit of using open source software for the development of project management tool.</p> <p>(ii) Give any two examples of open source software.</p> | 2            |
| Q12       | Explain Plagiarism with an example.                                                                                                                                                                                                                                                                                                                                                            | 2            |
| Q13       | Nowadays all of us frequently use social media to connect with our friends. Give any two netiquettes that we should follow while communicating on social media.                                                                                                                                                                                                                                | 2            |
| Q14       | Priyanka is using her internet connection to book a flight ticket. This is a classic example of leaving a trail of web activities carried by her. What do we call this type of activity? What is the risk involved by such kind of activity?                                                                                                                                                   | 2            |
| Q15       | Explain any two ways in which technology can help students with disabilities.                                                                                                                                                                                                                                                                                                                  | 2            |

**Answer (Type-1)**

| <b>QN</b> | <b>Answers</b>                                                                                                                                                                                                                                                                                                                                  | <b>Marks</b> |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1         | E-waste refers to discarded electronic devices such as computers, mobiles and televisions. It adversely affects the environment by releasing toxic chemicals like lead and mercury into the soil and water, thereby causing pollution.                                                                                                          | 2            |
| 2         | Digital footprints are the data trails left by users while performing activities online.<br>An active digital footprint is created intentionally when a user posts or fills a form, whereas a passive digital footprint is created unknowingly when data is collected in the background.                                                        | 2            |
| 3         | Intellectual Property Rights (IPR) are legal rights granted to creators of original works such as inventions, music or books.<br>They are important in the digital world because they protect innovation from misuse and give credit to the rightful creator.                                                                                   | 2            |
| 4         | 1. Excessive use of digital devices causes eye strain due to continuous screen exposure.<br>2. It also leads to poor posture problems like back and neck pain.                                                                                                                                                                                  | 2            |
| 5         | 1. E-waste management reduces environmental pollution by safe disposal of hazardous substances.<br>2. It conserves valuable natural resources by recycling metals and components.<br>3. It helps in saving energy through reuse and recycling processes.<br>4. It promotes sustainable development by ensuring minimal harm to the environment. | 2            |
| 6         | 1. Respect the privacy of others.<br>2. Use polite and respectful language.<br>3. Avoid spamming or posting irrelevant content.<br>4. Report cyberbullying or harmful activities.                                                                                                                                                               | 2            |
| 7         | 1. Excessive use of technology causes stress and anxiety.<br>2. It also leads to sleep disorders due to prolonged exposure to digital screens.                                                                                                                                                                                                  | 2            |
| 8         | A digital footprint is the online trail of user activities.<br>It is created, for example, by online shopping and submitting forms on websites.                                                                                                                                                                                                 | 2            |
| 9         | Copyright infringement is using someone else's work without permission.                                                                                                                                                                                                                                                                         | 2            |

|    |                                                                                                                                                                                              |   |
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|    | It can be avoided by using licensed material and citing sources properly.                                                                                                                    |   |
| 10 | Trademark infringement means unauthorized use of a registered brand logo or name.<br>The owner can take legal action under IPR to stop misuse and claim damages.                             | 2 |
| 11 | (i) One benefit of open-source software is that it is cost-effective and customizable.<br>(ii) Examples of open-source software are Linux and LibreOffice.                                   | 2 |
| 12 | Plagiarism means presenting someone else's work as your own.<br>For example, copying text from a website into a project without giving credit is plagiarism.                                 | 2 |
| 13 | 1. On social media is to communicate respectfully with others.<br>2. To avoid spreading fake or misleading information.                                                                      | 2 |
| 14 | When Priyanka books a flight ticket online, it creates a digital footprint of her activity.<br>The risk is that her personal data can be misused, leading to privacy loss or identity theft. | 2 |
| 15 | 1. Technology helps disabled students with screen readers for the visually impaired.<br>2. It also helps with speech recognition tools for students with physical challenges.                | 2 |

### Question Type: Short Answer (Type-2)

| QN | Questions                                                                                                                                                                                                                                                                                                                                                                                                                                           | Marks |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1 | Rahul has recently invented a new type of solar-powered water purification system and is concerned about the possibility of someone illegally copying and selling his invention without his permission.<br><br>I. Explain Rahul the terms Intellectual Property & Intellectual Property Rights (IPR).<br>II. Under which specific category of IPR is Rahul's invention covered?<br>III. Describe the importance of IPR in safeguarding innovations. | 3     |
| Q2 | Ayesha's family is replacing their old computer with a new one. They decide to throw the old computer in a nearby empty field/plot.<br><br>I. Explain any one potential environmental hazard associated with improper e-waste disposal.<br>II. Suggest one responsible way to Ayesha's family for proper disposal of their old computer.                                                                                                            | 3     |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |
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|     | III. Describe the importance of recycling in e-waste management.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |
| Q3  | <p>Nadar has recently shifted to a new city and school. She does not know many people in her new city and school. But all of a sudden, someone is posting negative, demeaning comments on her social networking profile etc. She is also getting repeated mails from unknown people. Every time she goes online, she finds someone chasing her online.</p> <p>I. What is this happening to Nadar?</p> <p>II. What immediate action should she take to handle it?</p> <p>III. Is there any law in India to handle such issues? Discuss briefly.</p> | 3 |
| Ans | <p>I. Nadar is facing cyberbullying and cyberstalking.</p> <p>II. She should immediately block and report the offenders and file a complaint.</p> <p>III. In India, such issues are addressed under the Information Technology Act, 2000.</p>                                                                                                                                                                                                                                                                                                      | 3 |
| Q4  | What do you understand by plagiarism? Why is it a punishable offence? Mention any two ways to avoid plagiarism.                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3 |
| Q5  | <p>Akshay is writing a research paper and directly copies several paragraphs from an online article without crediting the original author.</p> <p>I. Identify the act of misconduct.</p> <p>II. Suggest one way to Akshay to avoid such misconduct.</p> <p>III. What is the significance of IPR ?</p>                                                                                                                                                                                                                                              | 3 |
| Q6  | <p>Sarah works in a multinational IT firm. One day, she came to know that some mails were sent from her official mail account but she had not actually sent them.</p> <p>Based on the given information, answer the following questions :</p> <p>(i) Sarah is a victim of which type of cybercrime ?</p> <p>(ii) Write any two precautions that one should take to protect oneself from being the victim of cybercrime.</p> <p>(iii) Should Sarah immediately change the password of her email account ?</p>                                       | 3 |
| Q7  | <p>At a local electronics store, a new range of smartphones has been launched, creating a buzz among technology enthusiasts. However, the introduction of these new devices has also raised concerns about the increasing generation of e-waste in the community.</p> <p>Answer the following questions based on above extract :</p>                                                                                                                                                                                                               | 3 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |
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|     | <p>(i) Define e-waste.</p> <p>(ii) Give any one environmental challenge posed by e-waste, including its impact on air, water, and soil quality.90/S 10</p> <p>(iii) Imagine you are a part of a local environment organization. Provide any two strategies that could be implemented to minimize the negative environmental effects of e-waste.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |
| Q8  | <p>Riti received a message that she needs to update the KYC for her Bank Account therefore she should upload her Aadhar Card, Bank Account Number and the OTP on the link given in her message.</p> <p>Answer the following questions :</p> <p>(i) Should Riti upload the documents and give the OTP on the link ?</p> <p>(ii) Should Riti call her bank immediately to recheck the validity of the message received ?</p> <p>(iii) What is the act mentioned in the message known as ?</p>                                                                                                                                                                                                                                                                                         | 3 |
| Q9  | <p>Briefly explain the term FOSS. Give examples of any two Operating Systems that are FOSS.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3 |
| Q10 | <p>Ravi is a student studying in grade 12. He frequently uses the internet for various activities such as social networking, online shopping, and research for school projects. Recently, he noticed that he receives targeted advertisements based on his browsing history and is concerned about his digital footprint. Additionally, Ravi has encountered instances of cyberbullying and is unsure how to handle them.</p> <p>Help Ravi by answering the following questions :</p> <p>(i) What are digital footprints, and how are they created ?</p> <p>(ii) Write any two net etiquettes that Ravi should follow to ensure respectful and responsible online behaviour.</p> <p>(iii) How can Ravi protect himself from cyberbullying ? Mention any one protective measure.</p> | 3 |
| Q11 | <p>Police officials arrested four members of an interstate gang for allegedly duping many people from different states on the pretext of providing them with holiday packages</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | <p>after creating fake websites of Tours and Travels. The cyber criminals sent fraudulent emails containing links to fraudulent websites created by them.</p> <p>The victim in his complaint told police that he was offered a holiday package to Dubai for a total of 10 times in the next 10 years and was charged ₹ 1.45 lakh through his credit card.</p> <p>Answer the following questions pertaining to the given news byte :</p> <p>(i) Identify the type of cybercrime mentioned in above case.</p> <p>(ii) Which Act deals with such crimes in India ?</p> <p>(iii) Suggest any one precaution that can be taken to avoid falling prey to such criminals.</p>                                                                                                                                                                                                                                                                                                                                                            |   |
| Q12 | <p>ABC Electronics, a popular electronics retail chain, has been a prominent player in the market for years. However, recent concerns over environmental degradation and e-waste have prompted the company to rethink its strategies and practices. As the newly appointed sustainability manager, you've been asked to answer the following questions :</p> <p>(i) Considering the environmental concerns associated with e-waste, outline any one negative impact of the electronic products on the environment.</p> <p>(ii) Gopal is a college student who recently bought his new smartphone from ABC electronics. He's excited about the new features and improved performance of his new device. However, he's now left with his old smartphone, which is still functional but considered outdated. Suggest him any one action that he can take for his old smartphone.</p> <p>(iii) Provide any one recommendation on how ABC Electronics can responsibly manage its e-waste while minimizing harm to the environment.</p> | 3 |
| Q13 | <p>Manohar received an email from a company, named Makemoney Pvt. Ltd., claiming that Manohar has won ₹20 lakhs in a survey done online. In order to claim the prize money, he was required to answer few security questions such as his Name, Account number, PAN card details, Phone number and OTP for verification purposes. For this, he had to click on the link provided in the email.</p> <p>Answer the following questions :</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3 |

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|     | (i) Should Manohar give the required details to the company ?<br>(ii) What is the activity depicted above ?<br>(iii) What should he do with this email ? |   |
| Q14 | What do you understand by the term Hacking ? Write any two measures that one should take to avoid being the victim of hacking.                           | 3 |
| Q15 | Explain the role of online social media campaigns, crowdsourcing and smart mobs in society.                                                              | 3 |

### Answer (Type-2)

| QN | Answers                                                                                                                                                                                                                                                                                                                 | Marks |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1  | I. Intellectual Property refers to creations of the mind, and Intellectual Property Rights are the legal rights to protect such creations.<br>II. Rahul's invention comes under the category of patents.<br>III. IPR is important as it safeguards innovations, prevents misuse and encourages creativity.              | 3     |
| 2  | I. Improper disposal of e-waste releases toxic substances such as lead and mercury which pollute soil and water.<br>II. Ayesha's family should dispose of their old computer through an authorized recycling centre.<br>III. Recycling is important because it conserves resources and reduces environmental pollution. | 3     |
| 3  | I. Nadar is facing cyberbullying and cyberstalking.<br>II. She should immediately block and report the offenders and file a complaint.<br>III. In India, such issues are addressed under the Information Technology Act, 2000.                                                                                          | 3     |
| 4  | Plagiarism means using someone else's work without credit.<br>It is punishable because it violates IPR laws and is academic dishonesty.<br>It can be avoided by citing sources and rewriting content in one's own words.                                                                                                | 3     |
| 5  | I. The act of misconduct by Akshay is plagiarism.<br>II. To avoid this, he should credit the original author properly.<br>III. IPR is significant as it protects authors' rights and ensures fair recognition.                                                                                                          | 3     |

|    |                                                                                                                                                                                                                                                                                                           |    |
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| 6  | <p>(i) Sarah is a victim of hacking as mails were sent from her account without her consent.</p> <p>(ii) Two precautions are using strong passwords and enabling two-factor authentication.</p> <p>(iii) Yes, she should immediately change her password to secure her account.</p>                       | 3  |
| 7  | <p>(i) E-waste refers to discarded electronic devices such as mobiles and computers.</p> <p>(ii) E-waste pollutes air, water, and soil with toxic substances like lead and mercury.</p> <p>(iii) Strategies to reduce e-waste include recycling drives and spreading awareness for safe disposal.</p>     | 3  |
| 8  | <p>(i) Riti should not upload her Aadhaar card, bank details or OTP on the link.</p> <p>(ii) She should immediately call her bank to verify the authenticity of the message.</p> <p>(iii) This activity is known as phishing.</p>                                                                         | 3  |
| 9  | FOSS stands for Free and Open Source Software. It is free to use, modify and distribute. Examples of FOSS operating systems are Ubuntu and Fedora.                                                                                                                                                        | 3  |
| 10 | <p>(i) Digital footprints are online trails created by a user's activities like browsing or shopping.</p> <p>(ii) Two netiquettes Ravi should follow are respecting privacy and avoiding offensive posts.</p> <p>(iii) To protect himself from cyberbullying, Ravi should block and report the bully.</p> | 3  |
| 11 | <p>(i) The type of cybercrime is phishing, where fake websites are created to cheat people.</p> <p>(ii) In India, this is dealt with under the IT Act, 2000.</p> <p>(iii) A precaution is to avoid clicking on suspicious links or giving details to unknown websites.</p>                                | 3  |
| 12 | <p>(i) One negative impact of e-waste is pollution of soil and water by harmful chemicals.</p> <p>(ii) Gopal can donate or reuse his old smartphone instead of throwing it away.</p> <p>(iii) ABC Electronics can manage e-waste by setting up recycling centres and promoting awareness.</p>             | 3  |
| 13 | <p>(i) Manohar should not share his personal or banking details with the company.</p> <p>(ii) The activity is phishing, where fraudsters try to obtain sensitive data.</p> <p>(iii) He should delete the email and report it as spam.</p>                                                                 | 33 |

|    |                                                                                                                                                                                                                                                      |   |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 14 | Hacking is the unauthorized access to computer systems or networks.<br>Measures to avoid hacking is :<br>1. Using strong and unique passwords.<br>2. Installing antivirus software and firewalls.                                                    | 3 |
| 15 | Social media campaigns create awareness about social and environmental issues.<br>Crowdsourcing collects ideas and resources from the public for problem solving.<br>Smart mobs mobilize people quickly through digital platforms for social causes. | 3 |

### BOARD QUESTIONS

| Q.N. | <b>Part 2 Topic: Societal Impacts</b><br><b>Section A</b><br><b>Question Type: MCQ (Multiple Choice Questions/Fill in the Blank)</b>                                                                                   | Marks |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Q1   | Karan received a text claiming to be from his mobile carrier, asking him to click a link and enter his OTP to avoid disconnection. This is an example of:<br>(A) Hacking (B) Cyberbullying (C) Phishing (D) Plagiarism | 1     |
| Q2   | Aditi has composed an original song and wants exclusive rights over its reproduction and distribution. Which IPR protects her?<br>(A) Patent (B) Trademark (C) Copyright (D) Design                                    | 1     |
| Q3   | In India, cyber crime and e-commerce related matters are primarily governed by:<br>(A) Cyber Security Act, 2005 (B) Information Technology Act, 2000<br>(C) Digital India Act, 2000 (D) Data Protection Act, 2011      | 1     |
| Q4   | Discarded electronic items such as old keyboards, mobile phones and monitors are collectively called:<br>(A) Recyclable plastic (B) E-waste (C) Digital debris (D) Hardware scrap                                      | 1     |
| Q5   | Copying someone's project work word-for-word and submitting it as one's own is called:<br>(A) Hacking (B) Identity theft (C) Plagiarism (D) Phishing                                                                   | 1     |
| Q6   | Sending deceptive emails pretending to be from a trustworthy organization, in order to steal personal data, is called:<br>(A) Cyberstalking (B) Phishing (C) Ransomware (D) Trademark infringement                     | 1     |
| Q7   | Patents, copyrights and trademarks are collectively referred to as:<br>(A) Digital Rights (B) Intellectual Property Rights (C) Consumer Rights (D) Data                                                                | 1     |

|                                                                                                                   |                                                                                                                                                                                                          |   |
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|                                                                                                                   | Protection Rights                                                                                                                                                                                        |   |
| Q8                                                                                                                | Burning circuit boards to dispose of e-waste releases a toxic element that can cause skin disorders and lung disease, namely:<br>(A) Nitrogen (B) Beryllium (C) Argon (D) Helium                         | 1 |
| Q9                                                                                                                | Which of the following is NOT a Free and Open Source Software (FOSS)?<br>(A) Blender (B) GIMP (C) Microsoft Office (D) Linux                                                                             | 1 |
| Q10                                                                                                               | An attacker encrypts a company's files and demands payment to unlock them. This is known as:<br>(A) Phishing (B) Ransomware (C) Plagiarism (D) Identity theft                                            | 1 |
| Q11                                                                                                               | A non-profit organization that lets creators license their work for free public sharing while retaining some rights is:<br>(A) Creative Commons (B) Open Society (C) Public Archive (D) Free Media Trust | 1 |
| Q12                                                                                                               | Which of these is NOT considered a cybercrime?<br>(A) Cyberstalking (B) Updating your antivirus software (C) Identity theft (D) Data theft                                                               | 1 |
| Q13                                                                                                               | A discarded but still-usable electronic item, such as an old working laptop, is an example of:<br>(A) Biodegradable waste (B) E-waste (C) Organic waste (D) Recyclable paper                             | 1 |
| Q14                                                                                                               | In "FOSS", the letter 'F' commonly stands for:<br>(A) Fixed (B) Free (C) Fast (D) Formal                                                                                                                 | 1 |
| Q15                                                                                                               | The legal right granted to a creator of an original literary, artistic or musical work is known as:<br>(A) Trademark (B) Patent (C) Copyright (D) License                                                | 1 |
| Q16                                                                                                               | The trail of data generated when you browse, shop or post online is known as your:<br>(A) Digital signature (B) Digital footprint (C) Online ledger (D) Browser history                                  | 1 |
| Q17                                                                                                               | Secretly gathering someone's personal details online in order to commit fraud is called:<br>(A) Plagiarism (B) Trademark infringement (C) Identity theft (D) Cyberbullying                               | 1 |
| Q18                                                                                                               | Which statement about a patent is TRUE?<br>(A) It protects a brand name (B) It grants exclusive rights over a new invention for a fixed period (C) It applies only to books (D) It never expires         | 1 |
| Q19                                                                                                               | Exposure to which e-waste hazard is linked to respiratory and neurological damage?<br>(A) Water vapour (B) Lead (C) Oxygen (D) Nitrogen                                                                  | 1 |
| Q20                                                                                                               | Which of these is NOT something that unintentionally builds your digital footprint?<br>(A) Websites tracking your visit (B) Apps collecting location data (C) Taking a walk                              | 1 |
| <p><b>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</b> <span style="float: right;"><b>Page 174 of 183</b></span></p> |                                                                                                                                                                                                          |   |

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|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|     | outdoors (D) Ad networks logging your clicks                                                                                                                                                                                                                                                                                                                          |   |
| Q21 | Neha found a great paragraph online for her assignment. What should she do to avoid plagiarism?<br>(A) Copy it directly without changes (B) Paraphrase it in her own words and cite the source (C) Ask a classmate to submit it under their name instead<br>(D) Translate it and submit it as her own                                                                 | 1 |
| Q22 | How long does patent protection typically last from the date of filing?<br>(A) 10 years (B) 15 years (C) 20 years (D) 25 years                                                                                                                                                                                                                                        | 1 |
| Q23 | Which of these is a genuine feature of Open Source Software?<br>(A) Source code is hidden from users (B) It always costs money to use<br>(C) Its source code can be viewed, modified and redistributed (D) It cannot be installed on multiple devices                                                                                                                 | 1 |
| Q24 | A common symptom linked to prolonged screen time is:<br>(A) Improved sleep (B) Eye strain (C) Better posture (D) Increased attention span                                                                                                                                                                                                                             | 1 |
| Q25 | Assertion (A): Phishing emails often create a false sense of urgency.<br>Reasoning (R): Urgency pressures victims into acting quickly without verifying the request.<br>(A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true and R is not the correct explanation of A (C) A is true but R is false (D) A is false but R is true | 1 |
| Q26 | A respectful practice to follow while interacting with others online is to:<br>(A) Share others' private information publicly (B) Use respectful and inclusive language<br>(C) Provoke arguments intentionally (D) Ignore others' consent before tagging them                                                                                                         | 1 |
| Q27 | A patent grants an inventor exclusive rights for how many years, after which the invention enters public use?<br>(A) 20 (B) 30 (C) 15 (D) 25                                                                                                                                                                                                                          | 1 |
| Q28 | Long-term exposure to which e-waste-related toxin is associated with brain and kidney damage?<br>(A) Mercury (B) Oxygen (C) Nitrogen (D) Argon                                                                                                                                                                                                                        | 1 |
| Q29 | Riya built an assistive app for people with hearing impairments and wants to prevent others from copying its underlying invention. She should apply for a:<br>(A) Trademark (B) Copyright (C) Patent (D) Domain registration                                                                                                                                          | 1 |
| Q30 | Taking credit for someone else's idea or written work is formally known as:<br>(A) Cyberbullying (B) Hacking (C) Plagiarism (D) Spoofing                                                                                                                                                                                                                              | 1 |

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| Q31 | Ibrahim built a unique mobile application and wants legal protection against unauthorized copying of his code. He should apply for a:<br>(A) Patent (B) Copyright (C) Trademark (D) Rental agreement                                                                                                                                                    | 1 |
| Q32 | Simran received an SMS claiming to be from her electricity provider asking her to pay a pending bill via a link; she clicked it and lost money. This is:<br>(A) Cyberstalking (B) Phishing (C) Data theft (D) Cyberbullying                                                                                                                             | 1 |
| Q33 | Long hours of poor posture in front of a screen most commonly leads to:<br>(A) Better circulation (B) Back and neck strain (C) Faster typing speed (D) Improved digestion                                                                                                                                                                               | 1 |
| Q34 | Meera bought a licensed copy of design software but shared several unauthorized copies with friends. This act is called:<br>(A) Trademark infringement (B) Patent violation (C) Copyright infringement (D) Identity theft                                                                                                                               | 1 |
| Q35 | Which action helps protect the privacy of your digital data?<br>(A) Reusing the same password everywhere (B) Regularly updating your device's software (C) Downloading apps from unverified sources (D) Sharing your OTP with callers claiming to be your bank                                                                                          | 1 |
| Q36 | Gaining unauthorized entry into someone's computer system or account is called:<br>(A) Phishing (B) Hacking (C) Plagiarism (D) Trademark violation                                                                                                                                                                                                      | 1 |
| Q37 | Nitin noticed job recruiters seemed to already know about his online activity, though he never shared anything with them directly. They likely reviewed his:<br>(A) Water footprint (B) Carbon footprint (C) Digital footprint (D) Paper trail                                                                                                          | 1 |
| Q38 | Software that is free to use, and whose source code can be freely inspected, modified and shared, is called:<br>(A) Proprietary software (B) Trial software (C) Free and Open Source Software (D) Licensed software                                                                                                                                     | 1 |
| Q39 | Legal protections such as copyrights, trademarks and patents that safeguard original creations are together known as:<br>(A) Consumer Protection Rights (B) Intellectual Property Rights (C) Cyber Rights (D) Digital Ownership Rights                                                                                                                  | 1 |
| Q40 | Assertion (A): Cyberbullying can cause lasting emotional harm to its victims. Reasoning (R): Online harassment carries no legal consequences in India.<br>(A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true and R is not the correct explanation of A (C) A is true but R is false (D) A is false but R is true | 1 |
| Q41 | Ankit's startup designed a distinctive logo for their new clothing brand. This logo would                                                                                                                                                                                                                                                               | 1 |

|                                                                                                            |                                                                                                                                                                                                                                         |   |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                                                                                                            | be protected under:<br>(A) Patent (B) Copyright (C) Trademark (D) Design patent only                                                                                                                                                    |   |
| Q42                                                                                                        | Posting humiliating comments or images about a classmate repeatedly on social media to cause distress is called:<br>(A) Phishing (B) Hacking (C) Cyberbullying (D) Identity theft                                                       | 1 |
| Q43                                                                                                        | In India, which Act primarily governs cyber crime and electronic commerce?<br>(A) IT Act, 2000 (B) IT Act, 2008 only (C) Cyber Act, 1995 (D) Digital Commerce Act, 2010                                                                 | 1 |
| Q44                                                                                                        | Data collected about you without your direct action, such as through background tracking scripts, forms your:<br>(A) Active digital footprint (B) Passive digital footprint (C) Manual digital footprint (D) Verified digital footprint | 1 |
| Q45                                                                                                        | One of the "Rs" often recommended for responsible e-waste management, alongside reduce and recycle, is:<br>(A) Repaint (B) Reuse (C) Relocate (D) Rebrand                                                                               | 1 |
| <b>Answers</b>                                                                                             |                                                                                                                                                                                                                                         |   |
| Ans.1                                                                                                      | (C) Phishing                                                                                                                                                                                                                            | 1 |
| Ans.2                                                                                                      | (C) Copyright                                                                                                                                                                                                                           | 1 |
| Ans.3                                                                                                      | (B) Information Technology Act, 2000                                                                                                                                                                                                    | 1 |
| Ans.4                                                                                                      | (B) E-waste                                                                                                                                                                                                                             | 1 |
| Ans.5                                                                                                      | (C) Plagiarism                                                                                                                                                                                                                          | 1 |
| Ans.6                                                                                                      | (B) Phishing                                                                                                                                                                                                                            | 1 |
| Ans.7                                                                                                      | (B) Intellectual Property Rights                                                                                                                                                                                                        | 1 |
| Ans.8                                                                                                      | (B) Beryllium                                                                                                                                                                                                                           | 1 |
| Ans.9                                                                                                      | (C) Microsoft Office                                                                                                                                                                                                                    | 1 |
| Ans.10                                                                                                     | (B) Ransomware                                                                                                                                                                                                                          | 1 |
| Ans.11                                                                                                     | (A) Creative Commons                                                                                                                                                                                                                    | 1 |
| Ans.12                                                                                                     | (B) Updating your antivirus software                                                                                                                                                                                                    | 1 |
| Ans.13                                                                                                     | (B) E-waste                                                                                                                                                                                                                             | 1 |
| Ans.14                                                                                                     | (B) Free                                                                                                                                                                                                                                | 1 |
| Ans.15                                                                                                     | (C) Copyright                                                                                                                                                                                                                           | 1 |
| Ans.16                                                                                                     | (B) Digital footprint                                                                                                                                                                                                                   | 1 |
| Ans.17                                                                                                     | (C) Identity theft                                                                                                                                                                                                                      | 1 |
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| Ans.18 | (B) It grants exclusive rights over a new invention for a fixed period | 1 |
| Ans.19 | (B) Lead                                                               | 1 |
| Ans.20 | (C) Taking a walk outdoors                                             | 1 |
| Ans.21 | (B) Paraphrase it in her own words and cite the source                 | 1 |
| Ans.22 | (C) 20 years                                                           | 1 |
| Ans.23 | (C) Its source code can be viewed, modified and redistributed          | 1 |
| Ans.24 | (B) Eye strain                                                         | 1 |
| Ans.25 | (A) Both A and R are true and R is the correct explanation of A        | 1 |
| Ans.26 | (B) Use respectful and inclusive language                              | 1 |
| Ans.27 | (A) 20 years                                                           | 1 |
| Ans.28 | (A) Mercury                                                            | 1 |
| Ans.29 | (C) Patent                                                             | 1 |
| Ans.30 | (C) Plagiarism                                                         | 1 |
| Ans.31 | (B) Copyright                                                          | 1 |
| Ans.32 | (B) Phishing                                                           | 1 |
| Ans.33 | (B) Back and neck strain                                               | 1 |
| Ans.34 | (C) Copyright infringement                                             | 1 |
| Ans.35 | (B) Regularly updating your device's software                          | 1 |
| Ans.36 | (B) Hacking                                                            | 1 |
| Ans.37 | (C) Digital footprint                                                  | 1 |
| Ans.38 | (C) Free and Open Source Software                                      | 1 |
| Ans.39 | (B) Intellectual Property Rights                                       | 1 |
| Ans.40 | (C) A is true but R is false                                           | 1 |
| Ans.41 | (C) Trademark                                                          | 1 |
| Ans.42 | (C) Cyberbullying                                                      | 1 |
| Ans.43 | (A) IT Act, 2000                                                       | 1 |
| Ans.44 | (B) Passive digital footprint                                          | 1 |
| Ans.45 | (B) Reuse                                                              | 1 |

### Section B — Short Answer Questions

|     |                                                                                     |   |
|-----|-------------------------------------------------------------------------------------|---|
| Q1. | Define e-waste and state one environmental impact of improper disposal.             | 2 |
| Q2. | Differentiate between active and passive digital footprints, with one example each. | 2 |

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| Q3.                                                                                                        | What are Intellectual Property Rights (IPR)? State their importance in protecting digital creations.                                                                                                                                               | 2 |
| Q4.                                                                                                        | Mention two physical health issues that can result from excessive use of digital devices.                                                                                                                                                          | 2 |
| Q5.                                                                                                        | List any four practices that support responsible e-waste management.                                                                                                                                                                               | 2 |
| Q6.                                                                                                        | State any four netiquettes to be followed on social media platforms.                                                                                                                                                                               | 2 |
| Q7.                                                                                                        | Mention two lifestyle-related concerns linked to prolonged screen use.                                                                                                                                                                             | 2 |
| Q8.                                                                                                        | Define digital footprint and give two examples of activities that create one.                                                                                                                                                                      | 2 |
| Q9.                                                                                                        | What is copyright infringement? Suggest one way a user can avoid it.                                                                                                                                                                               | 2 |
| Q10.                                                                                                       | What is trademark infringement? What legal action can a trademark owner take against it?                                                                                                                                                           | 2 |
| Q11.                                                                                                       | A school is considering switching to open-source software for its computer labs. (i) State one benefit of this decision. (ii) Name two examples of open-source software it could use.                                                              | 2 |
| Q12.                                                                                                       | Explain plagiarism with a suitable example.                                                                                                                                                                                                        | 2 |
| Q13.                                                                                                       | Suggest any two netiquettes that should be followed while participating in an online class.                                                                                                                                                        | 2 |
| Q14.                                                                                                       | Rakesh used his mobile data to complete an online loan application. Name the kind of trail this creates, and state one risk of it.                                                                                                                 | 2 |
| Q15.                                                                                                       | Describe any two ways in which assistive technology can support students with disabilities.                                                                                                                                                        | 2 |
| <b>Short Answers Answers — Section B</b>                                                                   |                                                                                                                                                                                                                                                    |   |
| Ans.1                                                                                                      | E-waste refers to discarded electronic devices such as old phones, computers and monitors. Improperly disposed e-waste releases toxic substances like lead and mercury into soil and water, causing pollution.                                     | 2 |
| Ans.2                                                                                                      | An active digital footprint is created intentionally, such as posting a photo or filling an online form. A passive digital footprint is created without direct action, such as a website logging a visit through cookies.                          | 2 |
| Ans.3                                                                                                      | IPR are legal rights that protect creations of the mind, such as inventions, designs and creative works. They matter in the digital economy because they let creators control and benefit from their work while discouraging unauthorised copying. | 2 |
| Ans.4                                                                                                      | Excessive screen time can cause eye strain from prolonged focus on a bright display, and neck or back pain from poor posture while using devices.                                                                                                  | 2 |
| Ans.5                                                                                                      | Reduce consumption of new devices; reuse working electronics; recycle through authorised e-waste collection centres; and donate old but functional devices instead of discarding them.                                                             | 2 |
| Ans.6                                                                                                      | Be respectful in tone; avoid spreading unverified information; respect others' privacy; and avoid posting offensive content.                                                                                                                       | 2 |
| Ans.7                                                                                                      | Overuse of digital devices can disturb sleep patterns and increase stress or anxiety levels.                                                                                                                                                       | 2 |
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| Ans.8                                                                                                                          | A digital footprint is the trail of data left behind by online activity. Examples: making an online purchase, or filling out a web form.                                                                                                                                                                                           | 2 |
| Ans.9                                                                                                                          | Copyright infringement is using another person's protected creative work without permission. It can be avoided by using properly licensed material and crediting original sources.                                                                                                                                                 | 2 |
| Ans.10                                                                                                                         | Trademark infringement is the unauthorised use of a registered brand name or logo. The owner can take legal action to stop the misuse and claim damages.                                                                                                                                                                           | 2 |
| Ans.11                                                                                                                         | (i) One benefit is lower software licensing costs. (ii) Examples: LibreOffice and Linux.                                                                                                                                                                                                                                           | 2 |
| Ans.12                                                                                                                         | Plagiarism means presenting someone else's work as one's own; for example, copying a paragraph from a website into an assignment without citing it.                                                                                                                                                                                | 2 |
| Ans.13                                                                                                                         | Mute the microphone when not speaking, and avoid sharing disruptive or irrelevant content during the session.                                                                                                                                                                                                                      | 2 |
| Ans.14                                                                                                                         | This creates a digital footprint of Rakesh's activity. The risk is that his personal and financial data could be misused if it is leaked or accessed by others.                                                                                                                                                                    | 2 |
| Ans.15                                                                                                                         | Screen readers help students with visual impairments access text-based content, and speech-to-text tools help students with limited mobility complete written work.                                                                                                                                                                | 2 |
| <p align="center"><b>Section C — Short Answer Questions (Type-2, Case-based)</b></p> <p align="center"><b>3 marks each</b></p> |                                                                                                                                                                                                                                                                                                                                    |   |
| Q1.                                                                                                                            | Farhan invents a compact water-filtration device and worries someone will manufacture and sell it without his consent.<br>I. Differentiate between Intellectual Property and Intellectual Property Rights.<br>II. Which category of IPR covers Farhan's invention?<br>III. Why are IPR important for inventors like Farhan?        | 3 |
| Q2.                                                                                                                            | The Sharma family disposes of their broken television by leaving it on the roadside.<br>I. Explain one environmental hazard of improper e-waste disposal.<br>II. Suggest a responsible alternative for disposing of the television.<br>III. Explain the importance of the "reduce, reuse, recycle" approach in e-waste management. | 3 |
| Q3.                                                                                                                            | Ever since Tanya joined a new college, an anonymous account has been posting insulting comments about her online and she keeps receiving unwanted messages from strangers.<br>I. What is happening to Tanya?<br>II. What immediate steps should she take?<br>III. Which law in India addresses such issues?                        | 3 |
| Q4.                                                                                                                            | Explain plagiarism. Why is it treated seriously in academic and professional settings? Mention any two ways to avoid it.                                                                                                                                                                                                           | 3 |
| Q5.                                                                                                                            | Vikram is preparing a presentation and copies several slides from an online source without mentioning the author.<br>I. Identify Vikram's misconduct.<br>II. Suggest one corrective action.                                                                                                                                        | 3 |
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|                                                                                                            | III. State the significance of IPR in this context.                                                                                                                                                                                                                                                                                                                                                                                                  |   |
| Q6.                                                                                                        | Deepa discovered that someone had been posting messages on her social media account without her knowledge.<br>(i) What kind of cybercrime is Deepa a victim of?<br>(ii) Suggest two precautions to prevent such incidents.<br>(iii) Should Deepa report this to the platform and change her credentials immediately?                                                                                                                                 | 3 |
| Q7.                                                                                                        | A new electronics showroom is drawing large crowds for its latest gadget launch, prompting local residents to raise concerns about disposal of outdated devices.<br>(i) Define e-waste.<br>(ii) Mention one environmental effect of improperly discarded e-waste.<br>(iii) As a member of a residents' welfare association, suggest two measures to reduce the community's e-waste impact.                                                           | 3 |
| Q8.                                                                                                        | Yusuf gets a call from someone claiming to be a bank representative, asking him to share his card number and OTP to "verify" his account.<br>(i) Should Yusuf share these details over the phone?<br>(ii) What should he do instead to confirm the caller's identity?<br>(iii) What is this kind of fraudulent activity called?                                                                                                                      | 3 |
| Q9.                                                                                                        | Explain FOSS. Name two examples of FOSS applications used for document editing or image design.                                                                                                                                                                                                                                                                                                                                                      | 3 |
| Q10.                                                                                                       | Aman spends several hours daily browsing, shopping and gaming online, and has recently noticed unusually targeted ads. He has also faced unpleasant comments from strangers in a gaming chat.<br>(i) What causes the targeted ads he is seeing?<br>(ii) Suggest two netiquettes for safer online gaming interactions.<br>(iii) What should Aman do if the unpleasant comments continue?                                                              | 3 |
| Q11.                                                                                                       | Authorities recently busted a racket that built a fake e-commerce website to collect payments for products that were never delivered, cheating hundreds of buyers.<br>(i) Identify the cybercrime described.<br>(ii) Which Act in India deals with such offences?<br>(iii) Suggest one precaution shoppers can take to avoid such scams.                                                                                                             | 3 |
| Q12.                                                                                                       | GreenTech Appliances, an electronics manufacturer, wants to reduce the environmental footprint of the products it sells, as part of a new sustainability drive.<br>(i) State one negative environmental impact of poorly managed e-waste.<br>(ii) A customer has an old but working appliance, suggest what they could do with it instead of discarding it.<br>(iii) Recommend one action GreenTech itself could take to manage e-waste responsibly. | 3 |
| Q13.                                                                                                       | Leena gets an email announcing she has won a lottery prize, and to claim it she must share her bank account number, Aadhaar details, and an OTP.<br>(i) Should Leena share these details?<br>(ii) What is this fraudulent activity commonly called?<br>(iii) What should she do with such an email?                                                                                                                                                  | 3 |
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| Q14.                                                                                                       | What do you understand by the term identity theft? Suggest two precautions to guard against it.                                                                                                                                                                                                                              | 3 |
| Q15.                                                                                                       | Explain the role of crowdsourcing and online awareness campaigns in solving real-world social problems                                                                                                                                                                                                                       | 3 |
| <b>Answers — Section C</b>                                                                                 |                                                                                                                                                                                                                                                                                                                              |   |
| Ans.1                                                                                                      | Intellectual Property refers to creations of the mind, such as inventions, designs and writing; Intellectual Property Rights are the legal protections granted over such creations.<br>Patent,<br>IPR protect inventors' effort and investment, encourage innovation, and prevent unauthorised commercial use of their work. | 3 |
| Ans.2                                                                                                      | Improperly discarded e-waste can leach toxic substances such as lead into soil and groundwater.<br>They should hand it over to an authorised e-waste collection or recycling centre.<br>This approach conserves resources, reduces pollution, and limits the amount of hazardous waste sent to landfills.                    | 3 |
| Ans.3                                                                                                      | Cyberbullying and cyberstalking.<br>She should block and report the accounts, preserve evidence of the messages, and inform a trusted adult or the college authorities,<br>The Information Technology Act, 2000 addresses such offences in India.                                                                            | 3 |
| Ans.4                                                                                                      | Plagiarism is presenting someone else's work or ideas as one's own without credit. It is taken seriously because it is dishonest, violates the original creator's rights, and undermines trust in academic or professional work. It can be avoided by properly citing sources and paraphrasing ideas in one's own words.     | 3 |
| Ans.5                                                                                                      | Plagiarism.<br>He should credit the original source or seek permission to reuse the material.<br>IPR protects original creators' rights and ensures they receive proper recognition and control over their work.                                                                                                             | 3 |
| Ans.6                                                                                                      | Hacking, or unauthorised access to her account.<br>Use a strong, unique password and enable two-factor authentication.<br>Yes, she should report it to the platform and change her password immediately.                                                                                                                     | 3 |
| Ans.7                                                                                                      | E-waste refers to discarded electronic devices and components that are no longer in use.<br>It can pollute soil, water and air with toxic substances released from damaged circuitry.<br>Organise a community e-waste collection drive, and raise awareness about certified                                                  | 3 |
| <div> <div>KVS/RO-AGRA/QUESTION BANK/ 2026-27/XII-IP</div> <div>Page <b>182</b> of <b>183</b></div> </div> |                                                                                                                                                                                                                                                                                                                              |   |

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|        | recycling centres.                                                                                                                                                                                                                                                                                                                                        |   |
| Ans.8  | <p>No, he should not share his card number or OTP over the phone.</p> <p>He should hang up and call the bank directly using the number on his card or official website.</p> <p>This is called phishing (or vishing, when carried out by phone).</p>                                                                                                       | 3 |
| Ans.9  | FOSS stands for Free and Open Source Software — software that is free to use and whose source code can be viewed, modified and redistributed. Examples: LibreOffice Writer for documents, and GIMP for image editing.                                                                                                                                     | 3 |
| Ans.10 | <p>The targeted ads result from his digital footprint being tracked by websites and advertisers based on his browsing and shopping activity.</p> <p>Use a respectful tone with other players, and avoid sharing personal information in chat.</p> <p>He should mute or block the offending players and report the behaviour to the game's moderators.</p> | 3 |
| Ans.11 | <p>Phishing / online shopping fraud.</p> <p>The Information Technology Act, 2000.</p> <p>Verify a seller's authenticity and reviews before making an online payment.</p>                                                                                                                                                                                  | 3 |
| Ans.12 | <p>Toxic elements from unmanaged e-waste can contaminate soil and water.</p> <p>They could donate or resell the appliance instead of discarding it.</p> <p>Set up a take-back or recycling programme for customers' old appliances.</p>                                                                                                                   | 3 |
| Ans.13 | <p>No, she should not share any of these details.</p> <p>This is called phishing.</p> <p>She should not respond, delete the email, and report it as spam or fraud.</p>                                                                                                                                                                                    | 3 |
| Ans.14 | Identity theft is the fraudulent use of another person's personal information, typically for financial gain. Precautions: avoid sharing personal details on unverified sites, and use strong, unique passwords for online accounts.                                                                                                                       | 3 |
| Ans.15 | Crowdsourcing gathers ideas, funding or effort from a large number of people to solve a problem collectively. Online awareness campaigns use social media and digital platforms to inform and mobilise the public around social causes, amplifying reach at low cost.                                                                                     | 3 |