Pre-board Examination (2025-26)

Class: XII   **Subject : Informatics Practices(065)**   **Time : 3 Hrs.**   **Max. Marks:70**

General Instructions:
- All questions are compulsory.
- The examination paper contains five sections, from Section A to Section E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
- Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
- Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.
- Section D consists of 2 questions (33 to 34). Each question carries 4 Marks.
- Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.
- There is no overall choice. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
- All programming questions are to be answered using Python Language only.
- In case of MCQ, text of the correct answer should also be written.

Q No.	Section-A (21 x 1 = 21 Marks)	Marks
1	**State whether the following statement is True or False:** DataFrame is immutable data structure that stores heterogeneous data.	1
2	**What will be the result of the following SQL query?** **SELECT POW(5, 4);** (A) 32 (B) 512 (C) 625 (D) 20	1
3	**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:** (A) Cyber Bullying (B) Identity theft (C) Ramsomeware (D) Phishing	1
4	**Which of the following Python statements is used to read a CSV file into a Pandas DataFrame?** (A) pd.read_csv('data.csv') (B) pd.load_csv('data.csv') (C) df.read_csv('data.csv') (D) pd.to_csv('data.csv')	1

5	Which of the following device regenerates signals in a network?	1
	(A) Modem	
	(B) Switch	
	(C) Repeater	
	(D) Router	
6	What is the output of Select LENGTH("Database") in SQL	1
	(A) 4	
	(B) 8	
	(C) 7	
	(D) 9	
7	Priya designed a new company logo. Which IPR protects it?	1
	(A) Patent	
	(B) Copyright	
	(C) Trademark	
	(D) Trade Secret	
8	The default data type for indices in Pandas DataFrame is:	1
	(A) String	
	(B) Integer	
	(C) Random	
	(D) Float	
9	Consider a table named Students that has four candidate keys. How many primary keys the table can have?	1
	(A) 1	
	(B) 2	
	(C) 3	
	(D) 4	
10	Skype and Zoom are examples of:	1
	(A) E-mail	
	(B) VoIP	
	(C) Social Networking	
	(D) Cloud Storage	

11	**Which SQL function returns total number of rows including NULL values?**	1
	(A) COUNT(*)	
	(B) COUNT(column_name)	
	(C) SUM(column_name)	
	(D) AVG(column_name)	
12	**Suppose s1 and s2 are two Pandas Series with some overlapping and some different indices. What happens when you subtract s2 from s1?**	1
	(A) An error occurs because indices do not match.	
	(B) Elements are subtracted based on their order, ignoring indices.	
	(C) The result contains all indices, with missing values filled as NaN.	
	(D) Only the indices present in both Series are retained in the result.	
13	**The primary law in India governing digital transactions is:**	1
	(A) IT Act, 2000	
	(B) Copyright Act, 1957	
	(C) Patent Act, 1970	
	(D) Cyber Regulation Act, 2010	
14	**Which SQL clause groups rows based on common values?**	1
	(A) ORDER BY	
	(B) SORT BY	
	(C) GROUP BY	
	(D) HAVING	
15	**Assume df is a DataFrame with consecutive integer indices starting from 0. Which of the following commands will select rows with index 2, 3, and 4?**	1
	(A) df.loc[2:4]	
	(B) df.loc[2:5]	
	(C) df.iloc[2:4]	
	(D) df.iloc[2:5]	
16	**Which topology connects all devices in a single line?**	1
	(A) Star	
	(B) Tree	
	(C) Mesh	
	(D) Bus	

17	**What is the use of the LCASE() function in SQL?**	1
	(A) To replace characters in a string	
	(B) To change the capital alphabets to small alphabets in a string	
	(C) To find the position of a substring in a string	
	(D) To extract characters from a string	
18	**Which statement creates a Pandas Series of 5 zeros(Note: pd is an alias for pandas)?** (A) pd.Series(5) (B) pd.Series([0]*5) (C) pd.Series(0,5) (D) pd.Series(range(5))	1
19	**Which is not a valid SQL function?** (A) MIN() (B) SUM() (C) COUNT() (D) SEEK()	1
	Q-20 and Q-21 are Assertion (A) and Reason (R) Type questions. **Choose the correct option as:** (A) Both A and R are True, and R correctly explains A. (B) Both A and R are True, but R does not correctly explain A. (C) A is True, but R is False. (D) A is False, but R is True.	
20	**Assertion (A):** In Pandas, df.shape returns number of rows and columns. **Reason (R):** Shape property returns dimensions of DataFrame.	1
21	**Assertion (A):**The CREATE TABLE command is a DDL (Data Definition Language) command. **Reason (R):**DDL commands are used to define, modify, or delete the structure of database objects such as tables, indexes, and schemas.	1
Q No.	**Section-B (7X2 = 14 Marks)**	**Marks**
22	What is a Pandas Series? Write one characteristic. OR List two differences between Series and ndarray in Python	2
23	What is plagiarism? Mention one way to prevent it.	2

24	Ravi wants to create a Pandas DataFrame as shown below: 1 Colour 2 5 . 0 2 Pencil 12.5 3 Eraser 2.5 Help him in completing the code below to achieve the desired output. Note: **df_data** is nested list. **import _____ as pd** **df_data = _____** **s = pd._____(df_data)** **print(s)**	2
25	Ananya, a student, has developed an online portfolio website to showcase her projects. She wants people around the world to access her website but is unsure how to make it available on the Internet. Explain to Ananya the role of a web server and web hosting in making her website accessible online OR Define cloud storage and mention one of its advantages	2
26	Write SQL queries to perform the following: I. Extract the month (as a number or name) from the date '2026-07-15'. II. Extract the rightmost 3 characters from the string "Informatics".	2
27	Define cyber stalking. How is it different from cyber bullying?	2
| 28 | Write the output of the following code: <br><br> ```
import pandas as pd
products = pd.Series(['Laptop', 'Mobile', 'Tablet'])
prices = pd.Series([55000, 25000, 30000])
data = {'Product': products, 'Price': prices}
df = pd.DataFrame(data)
df.rename(columns={'Product': 'Item', 'Price': 'Cost'}, inplace=True)
print(df)
``` <br><br> **OR** <br><br> Write the output of the following code: <br><br> ```
import pandas as pd
countries = pd.Series(['India', 'USA', 'Japan', 'Germany'])
currencies = pd.Series(['Rupee', 'Dollar', 'Yen', 'Euro'])
data = {'Country': countries, 'Currency': currencies}
df = pd.DataFrame(data)
df.drop(index=2, inplace=True)
print(df)
``` | 2 |
| **Q No** | **Section-C (4X3 = 12 Marks)** | **Marks** |
| | | |

29	Sneha is a software developer who has recently designed a unique mobile application that helps farmers predict weather patterns and get crop suggestions based on soil conditions. She is worried that someone might copy her application and launch it without giving her credit. I. Explain Sneha the terms Intellectual Property (IP) and Intellectual Property Rights (IPR). II. Under which specific category of IPR is Sneha's mobile application covered? III. Describe the role of IPR in protecting software and digital creations.	3

30	Write a Python program to create a Pandas Series as shown below using a dictionary, where the student names are the indices and their age are the values in the series.
	
	        Raghav 12
	        Satvik 1 6
	        Virnda 15
	        Heena 16
	
	OR
	
	Write a Python program to create the following Pandas DataFrame using a list of dictionaries:
	
	          Language **Users (in Millions)**
	0 Python 10
	1 Java 8
	2 JavaScript 12
		3

31	I. **Write an SQL query to create table TEACHERS with columns:** TeacherID (INT, Primary Key), Name (VARCHAR(25)), Subject (VARCHAR(20)), Salary (FLOAT). II. **Write an SQL Query to insert the following data into the TEACHERS** table: (201, "Anita", "Maths", 45000)	2+1=3

32	Consider the following tables:	3

Table 1: Employee, which stores Emp**ID**, Emp**Name**, and Department.

EmpID	EmpName	Department
101	Arjun Mehta	IT
102	Kavya Sharma	HR
103	Manish Gupta	Finance
104	Neha Kapoor	IT
105	Rakesh Verma	Marketing

Table 2: Salary, which stores Emp**ID**, Month, and Amount

EmpID	Month	Amount
101	January	55000
102	January	60000
103	January	72000
104	January	50000
105	January	65000

Write appropriate SQL queries for the following:

I. List the names of employees working in the IT department, sorted alphabetically.
II. Display the names of employees along with their salary amount greater than 60,000.
III. Show each employee's name, department, and salary amount by joining both tables.

OR

Consider the following table **PRODUCT**, which stores **ProductID, ProductName**, **Category and Price.**

Table: **PRODUCT**
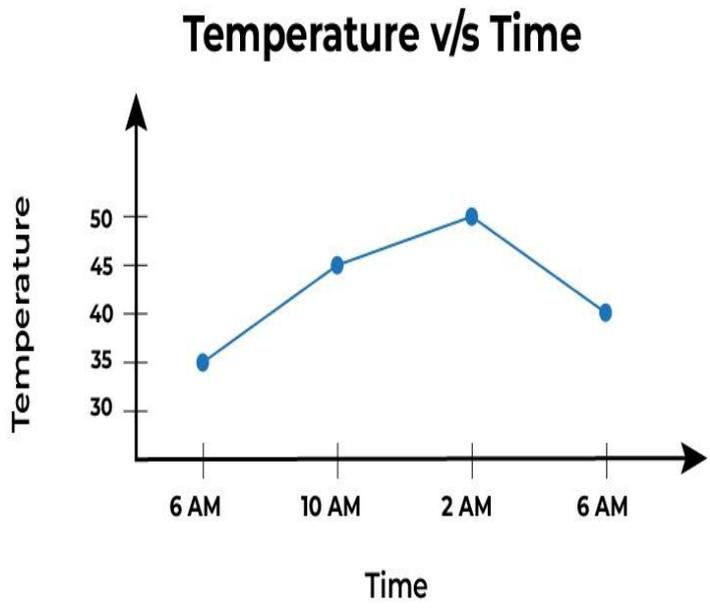
ProductID	ProductName	Category	Price
201	Laptop	Electronics	55000
202	Smartphone	Electronics	25000
203	Dining Table	Furniture	15000
204	Chair	Furniture	4000
205	Notebook	Stationery	50
206	Pen	Stationery	20

I. Which attribute in the Table can be considered as the Primary Key? Provide justification for your answer

II. Write a suitable SQL query to add a new column, **Stock**, of numeric data type to the table..

III. Write the output of the following SQL Query.

   SELECT Category, AVG(Price) FROM Product GROUP BY Category;

Q No.	Section-D (2X4 = 8 Marks)
33	Reena is working on a Python program to create a [cut off] represents the temperature of a city at different time [cut off] some parts of his code are incomplete. Help Reena by fillir [cut off] the following Python program.

Temperature v/s Time

```
_____ as plt #Statement-1
time = ['6 AM', '10 AM', '2 PM', '6 PM', 'May']
temp = [35,45,50,40]
_____ #Statement-2
plt.xlabel('Time')
plt.ylabel('Temperature')
_____ #Statement-3
_____ #Statement-4
plt.show()
```

I. Write the suitable code for the import statement in the blank space in the line marked as 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.

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 **temp.png**.

34	Ritu, who works as a database administrator, has created a table Employee as shown below:	4

Table : Employee

EmpID	EmpName	Department	City	HireDate	Salary
201	Arjun Mehta	IT	Delhi	2020-04-15	55000
202	Kavya Sharma	HR	Mumbai	2019-07-10	60000
203	Manish Gupta	Finance	Delhi	2021-02-20	72000
204	Neha Kapoor	Marketing	Chennai	2018-11-05	50000
205	Rakesh Verma	IT	Mumbai	2022-01-18	65000

Write suitable SQL query for the following.

I. Show the names of employees (EmpName) and their Department in uppercase, sorted alphabetically by Department.

II. Display the EmpID along with the year in which the employee was hired.

III. Calculate and display the highest salary among employees.

IV. Show each City along with the number of employees working in that city.

OR

Consider the following table and write the output of the following SQL Queries.

Table : Library

BookID	Title	Author	Genre	Price	IssueDate
301	The Silent River	R. Sharma	Fiction	450	2022-05-12
302	Data Science Essentials	K. Mehta	Education	650	2021-11-20
303	World History	P. Verma	History	550	2022-01-10
304	Python Programming	S. Kapoor	Education	700	2020-07-15
305	Inspiring Biographies	A. Singh	Biography	400	2022-03-05

Write the output of the following SQL Queries.

I. **SELECT Title, LENGTH(Title) FROM Library WHERE BookID < 303;**

II. **SELECT lower(Genre) FROM Library WHERE MONTH(IssueDate)=7;**

III. **SELECT AVG(Price) FROM Library;**

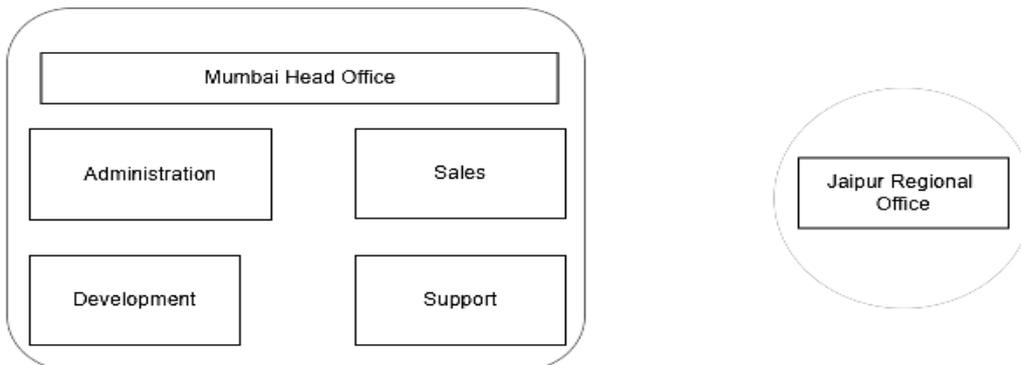IV. **SELECT Title,Author FROM Library WHERE Price BETWEEN 400 AND 600;**

Q No.	Section-E (3X5 = 15 Marks)	Marks

35	Ram Sons. is a leading multinational consumer support service provider. The company's head office is located in Mumbai while its Regional Office is in Jaipur. The Mumbai office consists of four departments: Administration, Sales, Development, and Support.	5

The distances between these departments, as well as between Mumbai and Jaipur, are as follows:

Administration to Sales	80 meters
Administration to Development	30 meters
Administration to Support	135 meters
Sales to Development	90 meters
Sales to Support	50 meters
Development to Support	75 meters
Mumbai Office to Jaipur Office	1550 kilometers

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

Administration	115
Sales	30
Development	65
Support	30
Jaipur Office	28

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. Suggest the placement of repeater in the fully connected layout between the departments in the Mumbai Office.

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

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

36	Consider the DataFrame **df** shown below.	5

RollNo	StudentName	Subject	Marks
101	Ananya Gupta	Math	88
102	Raj Mehta	Science	92
103	Priya Sharma	English	76
104	Karan Singh	Math	85
105	Sneha Kapoor	Science	90

Write Python statements for the following tasks:
I. Print the first two rows of the DataFrame df.
II. Add a new column named "Grade" with values ['A', 'A+', 'B', 'A', 'A+'].
III. Delete the column "Marks" from the DataFrame.
IV. Rename the column "StudentName" to "Name".
V. Display only the "RollNo" and "Subject" columns from the DataFrame..

37	Write suitable **SQL** query for the following:	5

       I. Display length of string "Informatics".
       II. Extract first 4 characters of EmpName from Employees table.
       III. Show maximum Salary from Employee table.
       IV. Display system date.
       V. Display total count of employees.
       OR
Write SQL queries:
       I. Display square of Marks from Student table.
       II. Count how many students scored above 80.
       III. Show distinct cities from Student table.
       IV. Extract year from Date_of_Birth column.
       V. Display names in lowercase from Student Table