केंद्रीय विद्यालय संगठन मुंबई संभाग

KENDRIYA VIDYALAYA SANGATHAN, MUMBAI REGION

STUDENT SUPPORT MATERIAL

हमारे संरक्षक

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LIST OF PARTICIPANTS IN 2 DAYS WORKSHOP
VENUE: KENDRIYA VIDYALAYA AMBAJHARI, NAGPUR

SNO	NAME OF PGT CS	NAME OF KV
1	MR. SATYANARAYAN MEENA	KV NO. 1 AHMEDNAGAR
2	MR. SAMRAT KHLI	VRDE AHMEDNAGAR
3	MR. GULSHAN KUMAR HANS	KV SCR NANDED
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5	MR. ANOOP MATHUR	KV NO. 1 VASCO-DA-GAMA, GOA
6	MR. DEEP PRAKASH CHAUDHARI	KV INS MANDOVI
7	MR. VIKASH KUMAR YADAV	KV OF CHANDA
8	MR. SANTOSH WATTAMWAR	KV YAVATMAL
9	MR. ATUL THAKARE	KV PULGAON
10	MRS. KIRAN SONANE	KV AJNI NAGPUR
11	MRS. SHIKHA SHAMBHARKAR	KV WCL NEW MAJRI
12	MRS. POOJA RAWAT	KV CRPF NAGPUR
13	MR. RAJEEV KUMAR PRITHIANI	KV ISP NASIK ROAD
14	MR. SANDEEP NILKANTH PATIL	KV AFS DEVLALI
15	MR. RAJENDRA GAVHALE	KV OF VARANGAON
16	MR. NITIN ARSE	KV NMU JALGAON
17	MR. SARAS MOHAN SHRIVASTAVA	KV DHULE
18	MR. RAVINDRA RAMESH CHARJAN	KV AFS OJHAR
19	MR. NAVEEN KUMAR GAYARI	KV NO.2 VASCO-DA-GAMA, GOA
20	MR. KHUMENDRA BISEN	KV AMBAJHARI
21	MRS. ARPITA ASHOK DHIRDE	KV MUDKHED CRPF
22	MRS. ARPITA DAS	KV AURANGABAD CANTT.
23	MR. NILESH MAHURE	KV VSN NAGPUR
24	MR. NITIN KUMAR UPADHYAY	KV BHUSAWAL
25	MRS. POOJA AGRAWAL	KV NASIK ROAD CAMP
26	MR. PRAMOD TUPE	KV AFS OJHAR
27	MR. RAJKAMAL ALARIA	KV NO. 1 DEVLALI
28	MRS. SWATI VISHWAKARMA	KV OF BHANDARA
29	MR. VISHANT D KHOBRAGADE	KV VSN NAGPUR
30	MS. SHIVALI TIWARI	KV KAMPTEE

CONTENT DEVELOPMENT TEAM			
SNO	NAME OF TOPIC	NAME OF CONTRIBUTOR	NAME OF KV
1	UNIT-I REVISION, FUNCTION	MR. RAVINDRA RAMESH CHARJAN	KV AFS OJHAR
2	UNIT-II COMPUTER NETWORKS	MR. VISHANT D KHOBRAGADE	KV VSN NAGPUR
3	UNIT-I INTRODUCTION TO FILES, TEXT FILES, BINARY FILES,CSV FILES, DATA STRUCTURE	MR. ANOOP MATHUR	KV NO. 1 VASCO-DA-GAMA, GOA
4	UNIT-III DATABASE MANAGEMENT	MR. ARUN CHAUDHARI	

REVIEW TEAM OF STUDY MATERIAL	
GROUP	CONTENTS FOR REVIEW
GROUP-1	UNIT-I REVISION, FUNCTION
MR. PRAMOD TUPE	
MR. SATYANARAYAN MEENA	
MR. SAMRAT KOHLI	
MR. GULSHAN KUMAR HANS	
MR. RAJ KUMAR BOKALIA	
MR. ANOOP MATHUR	
GROUP-2	UNIT-II COMPUTER NETWORKS
MRS. APARNA ASHOK DHIRDE	
MR. DEEP PRAKASH CHAUDHARI	
MR. VIKASH KUMAR YADAV	
MR. SANTOSH WATTAMWAR	
MR. ATUL THAKRE	
MRS. KIRAN SONANE	
MRS. SWATI VISHWAKARMA	
MS. SHIVALI TIWARI	
GROUP-3	UNIT-I INTRODUCTION TO FILES, TEXT FILES, BINARY FILES,CSV FILES, DATA STRUCTURE
MR. NITIN UPADHYAY	
MRS. SHIKHA SHAMBHARKAR	
MRS. POOJA RAWAT	
MR. RAJEEV KUMAR PRITHIANI	
MR. SANDEEP NILKANTH PATIL	
MR. RAJENDRA GAVHALE	
MRS. ARPITA DAS	
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MR. NITIN ARSE	
MR. SARAS MOHAN SHRIVASTAV	
MR. RAVINDRA RAMESH CHARJAN	
MR. NAVEEN KUMAR GAYARI	
MR. NILESH MOHURE	
MR. RAJKAMAL ALARIA	
MRS. POOJA AGRAWAL	

SAMPLE PAPER, ANSWER KEY PREPARATION TEAM	
GROUP	SUBJECT
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MRS. KIRAN SONANE	
MR. SAMRAT KOHLI	COMPUTER SCIENCE
MR. SATYANARAYAN MEENA	
MR. SANTOSH WATTAMWAR	COMPUTER SCIENCE
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MR. ATUL THAKRE	COMPUTER SCIENCE
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MR. PRAMOD TUPE	COMPUTER SCIENCE
MR. GULSHAN KUMAR HANS	
MR. DEEP PRAKASH CHAUDHARI	COMPUTER SCIENCE
MR. NAVEEN KUMAR	
MR. NILESH MAHURE	COMPUTER SCIENCE
MR. RAJEEV KUMAR PRITHIANI	
MRS. SHIKHA SHAMBHARKAR	
MR. SANDEEP NILKANTH PATIL	COMPUTER SCIENCE
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MR. ANOOP MATHUR	INFORMATICS PRACTICES
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MRS. APARNA ASHOK DHIRDE	INFORMATICS PRACTICES
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MR. RAJKAMAL ALARIA	INFORMATICS PRACTICES
MR. RAVINDRA RAMESH CHARJAN	

INDEX

Computer Science
CLASS-XII
Code No. 083

2022-23

1. Prerequisites

Computer Science- Class XI

2. Learning Outcomes

Student should be able to

a) apply the concept of function.
b) explain and use the concept of file handling.
c) use basic data structure: Stacks
d) explain basics of computer networks.
e) use Database concepts, SQL along with connectivity between Python and SQL.

3. Distribution of Marks:

Unit No.	Unit Name	Marks	Periods	
			Theory	Practical
I	Computational Thinking and Programming - 2	40	70	50
II	Computer Networks	10	15	---
III	Database Management	20	25	20
	Total	70	110	70

4. Unit wise Syllabus

Unit I: Computational Thinking and Programming – 2

- Revision of Python topics covered in Class XI.
- Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope)
- Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths
- Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file

- Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file
- CSV file: import csv module, open / close csv file, write into a csv file using csv.writer() and read from a csv file using csv.reader( )
- Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Unit II: Computer Networks

- Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)
- Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)
- Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)
- Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)
- Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)
- Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP
- Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

Unit III: Database Management

- Database concepts: introduction to database concepts and its need
- Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)
- Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command, aggregate functions (max, min, avg, sum, count), group by, having clause, joins: cartesian product on two tables, equi-join and natural join

- Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications

5. Practical

S.No.	Unit Name	Marks (Total=30)
1	**Lab Test:** 1. Python program (60% logic + 20% documentation + 20% code quality)	**8**
	2. A stub program with Python SQL connectivity must be provided with blanks (4 blanks) to be filled by the student with the desired SQL query.	**4**
2	Report file: • Minimum 15 Python programs. • SQL Queries – Minimum 5 sets using one table / two tables. • Minimum 4 programs based on Python - SQL connectivity	**7**
3	Project (using concepts learnt in Classes 11 and 12)	**8**
4	Viva voce	**3**

6. Suggested Practical List:

Python Programming

- Read a text file line by line and display each word separated by a #.
- Read a text file and display the number of vowels/consonants/uppercase/lowercase characters in the file.
- Remove all the lines that contain the character 'a' in a file and write it to another file.
- Create a binary file with name and roll number. Search for a given roll number and display the name, if not found display appropriate message.
- Create a binary file with roll number, name and marks. Input a roll number and update the marks.
- Write a random number generator that generates random numbers between 1 and 6 (simulates a dice).
- Write a Python program to implement a stack using list.
- Create a CSV file by entering user-id and password, read and search the password for given user-id.

Database Management

- Create a student table and insert data. Implement the following SQL commands on the student table:
    - ALTER table to add new attributes / modify data type / drop attribute
    - UPDATE table to modify data
    - ORDER By to display data in ascending / descending order
    - DELETE to remove tuple(s)
    - GROUP BY and find the min, max, sum, count and average
- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

7. Suggested Reading Material

- NCERT Textbook for COMPUTER SCIENCE (Class XII)
- Support Materials on the CBSE website.

8. Project

The aim of the class project is to create something that is tangible and useful using Python file handling/ Python-SQL connectivity. This should be done in groups of two to three students and should be started by students at least 6 months before the submission deadline. The aim here is to find a real world problem that is worthwhile to solve.

Students are encouraged to visit local businesses and ask them about the problems that they are facing. For example, if a business is finding it hard to create invoices for filing GST claims, then students can do a project that takes the raw data (list of transactions), groups the transactions by category, accounts forthe GST tax rates, and creates invoices in the appropriate format. Students can be extremely creative here. They can use a wide variety of Python libraries to create user friendly applications such as games, software for their school, software for their disabled fellow students, and mobile applications, of courseto do some of these projects, some additional learning is required; this should be encouraged. Students should know how to teach themselves.

The students should be sensitised to avoid plagiarism and violations of copyright issues while working on projects. Teachers should take necessary measures for this.

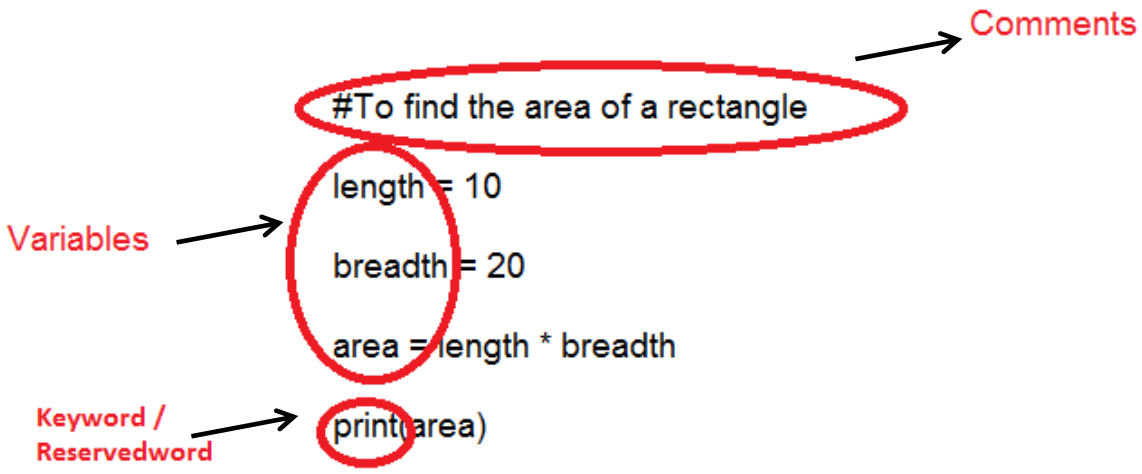
BLUE-PRINT
SAMPLE QUESTION PAPER SESSION 2022-23
CLASS-XII (COMPUTER SCIENCE-083)

S. NO.	TOPIC	1 MARK QUESTION	2 MARK QUESTION	3 MARK QUESTION	4 MARK QUESTION	5 MARK QUESTION	TOTAL MARKS
1	REVISION TOUR-1	4	1	-	-	-	**6**
2	REVISION TOUR-2	4	1	-	-	-	**6**
3	FUNCTIONS	1	1	1		(+2 marks o/p)	**8**
4	FILE HANDLING	5	-	1	1	1	**17**
5	DATA STRUCTURE	-	-	1	-	-	**3**
6	COMPUTER NETWORKS	1	2	-	-	1	**10**
7	DATABASE MANAGEMENT	3	2	2	1	(+3 marks python-mysql interface)	**20**
No. of Questions		**18**	**7**	**5**	**2**	**3**	**35(70)**

Revision Tour of python class XI

Basics of Python

Observe the program first then memorize the definitions:



Python keyword/ reserve words

Keywords are reserve words. Each keyword has a specific meaning to the Python interpreter, and we can use a keyword in our program only for the purpose for which it has been defined. As Python is case sensitive, keywords must be written exactly.

Identifiers

In programming languages, **identifiers** are names used to identify (Name) a variable, function, or other entities in a program. The rules for naming an identifier in Python are as follows:

- ➔ The name should begin with an uppercase or a lowercase alphabet or an underscore sign (_).
- ➔ This may be followed by any combination of characters a–z, A–Z, 0–9 or underscore (_) Thus, an identifier cannot start with a digit.
- ➔ It can be of any length. (However, it is preferred to keep it short and meaningful).
- ➔ It should not be a **keyword or reserve** word.
- ➔ We cannot use special symbols like !, @, #, $, %, etc., in identifiers.

Variables

A **variable** in a program is uniquely identified by a name (identifier). Variable in Python refers to an object — an item or element that is stored in the memory. Value of a variable can be a string (e.g., 'b', 'Global Citizen'), numeric (e.g., 345) or any combination of alphanumeric characters (CD67). In Python we can use an assignment statement to create new variables and assign specific values to them.

Comments

Comments are used to add a remark or a note in the source code. Comments are not executed by interpreter.

Comments in python can be created as:

- ➔ for single line comment use # (hash symbol)
- ➔ for multi line comment use ''' text ''' (in triple quotes)

Data Types

Every value belongs to a specific data type in Python. Data type identifies the type of data values a variable can hold and the operations that can be performed on that data.

Number

Number data type stores numerical values only. It is further classified into three different types: int, float and complex.

Try the following statements on system in shell mode and observe the output:

```
num1 = 10                    #(integer positive value )
type(num1)

num2 = -1210                 #(integer negative value)
type(num2)

float1 = -1921.9             #(float1 variable contain decimal value so it contains float value)
type(float1)

float2 = -9.8*10**2          #(float2 variable contain decimal value so it contains float value)
print(float2, type(float2))

var2 = -3+7.2j               #(var2 variable contain complex value)
print(var2, type(var2))
```

Boolean

```
var3= True                   # (var3 variable contain Boolean Value)
print(type(var3))            # print type Bool
```

Variables of simple data types like int, float, boolean, etc. hold single values. But such variables are not useful to hold a long list of information, for example, names of the months in a year, names of students in a class, names and numbers in a phone book or the list of artefacts in a museum. For this, Python provides data types like tuples, lists, dictionaries and sets.

Sequences can used as datatype in python

A Python sequence is an ordered collection of items, where each item is indexed by an integer. The three types of sequence data types available in Python are Strings, Lists and Tuples. A brief introduction to these data types is as follows:

(A) **String**

String is a group of characters. These characters may be alphabets, digits or special characters including spaces. String values are enclosed either in single quotation marks (e.g., 'KV') or in double quotation marks (e.g., "Vidyalaya"). The quotes are not a part of the string, they are used to mark the beginning and end of the string for the interpreter. For example:

Write your examples here:

Prove this statement using proper example: We cannot perform numerical operations on strings, even when the string contains a numeric value.

List is a sequence of items separated by commas and the items are enclosed in square brackets **[ ]**. In list we can change the items so we can say it's a **mutable** datatype

```
#To create a list
list1 = [5, 3.4, "New Delhi", "20C", 45]
print(list1)                # printing the elements of list1
```

Output: [5, 3.4, 'New Delhi', '20C', 45]

(C) Tuple

Tuple is a sequence of items separated by commas and items are enclosed in **parenthesis ( ).**Once created, we cannot change the tuple (**Records cannot be changed**) – i.e. we can say **immutable** datatype.

Tuple can be defined as

```
T=5,
T=(5,)
T=5,6,7,8
T= 'a','b','c',5,6,7
T=(5,6,'r','s','wel')
```

```
#create a tuple tuple1
tuple1 = (10, 20, "KV", 5.5, 'a')
print(tuple1)          #printing the elements of the tuple tuple1
```

Output: (10, 20, "KV", 5.5, 'a')

(D) Dictionary

Dictionary in Python holds data items in **key : value** pairs. Items in a dictionary are enclosed in curly braces **{ }**. Every key is separated from its value using a colon (:) sign. The **key : value** pairs of a dictionary can be accessed using the key. The keys are usually strings and their values can be any data type. In order to access any value in the dictionary, we have to specify its key in square brackets **[ ]**.

#create a dictionary

dict1 = {'Fruit':'Apple', 1:'Monday', 'Price Rs':120}

print(dict1)

output: {'Fruit': 'Apple', 1: 'Monday','Price Rs': 120}

print(dict1['Price Rs'])

output: 120

print(dict1[1])

output:'Monday'

(E) None

None is a special data type with a single value. It is used to signify the absence of value in a situation. None supports no special operations, and it is neither False nor 0 (zero).

```
myVar = None
print(type(myVar))
<class 'NoneType'>
print(myVar)
```

Mutable and Immutable Data Types

Variables whose values can be changed after they are created and assigned without changing their memory location are called **mutable**. Variables whose values cannot be changed after they are created and assigned or upon changing values their memory location is changed, are called **immutable**. When an attempt is made to update the value of an immutable variable, the old variable is destroyed and a new variable is created by the same name in new memory location.

Exercise: Define a variable by assigning a value, find and note its ID, change the value and again find its ID, now observe the difference and do it for different data types.

Precedence of Operators

Evaluation of the expression is based on precedence of operators. When an expression contains different kinds of operators, precedence determines which operator should be applied first. Higher precedence operator is evaluated before the lower precedence operator. (Simply apply BODMAS rules)

Order of Precedence (higher to lower)

1	**	Exponentiation (raised to the power)
2	~ ,+, -	Complement, unary plus and unary minus
3	* ,/, %, //	Multiply, divide, modulo and floor division
4	+, -	Addition and subtraction
5	<= ,< ,> ,>=	Relational operators
6	== ,!=	Equality operators
7	=, %=, /=, //=, -=, +=, *=, **=	Assignment operators
8	is	is not Identity operators
9	in, not in	Membership operators
10	not, and, or	Logical operators

*** For operators with equal precedence, the expression is evaluated from left to right except ** which is executed from right to left.**

Flow of Control

Selection

The if statement has following syntaxes:

1)

```
if condition:
    statement(s)
```

2)

```
if condition:
    statement(s)
else:
    statement(s)
```

3)

```
if condition:
    statement(s)
elif condition:
    statement(s)
elif condition:
    statement(s)
else:
    statement(s)
```

NOTE

Indentation

Python uses indentation for block as well as for nested block structures. Leading whitespace (spaces and tabs) at the beginning of a statement is called indentation. In Python, the same level of indentation associates statements into a single block of code. The interpreter checks indentation levels very strictly and throws up syntax errors if indentation is not correct. It is a common practice to use a single tab for each level of indentation.

Repetition

Repetition of a set of statements in a program is made possible using looping constructs.

The 'for' Loop

The for statement is used to iterate over a range of values or a sequence. The for loop is executed for each of the items in the range. These values can be either numeric, or they can be elements of a data type like a string, list, tuple or even dictionary.

Syntax of the for Loop

for <control-variable> in <sequence/ items in range>:

    <statements inside body of the loop>

The 'while' Loop

The while statement executes a block of code repeatedly as long as the control condition of the loop is true. The control condition of the while loop is executed before any statement inside the loop is executed. After each iteration, the control condition is tested again and the loop continues as long as the condition remains true. When this condition becomes false, the statements in the body of loop are not executed and the control

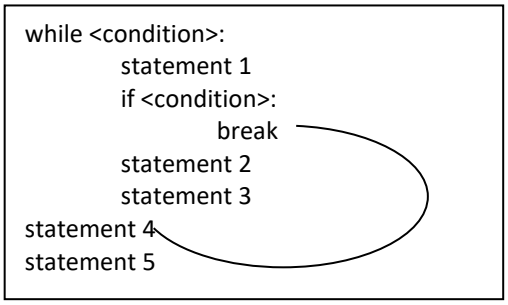
is transferred to the statement immediately following the body of while loop. If the condition of the while loop is initially false, the body is not executed even once.

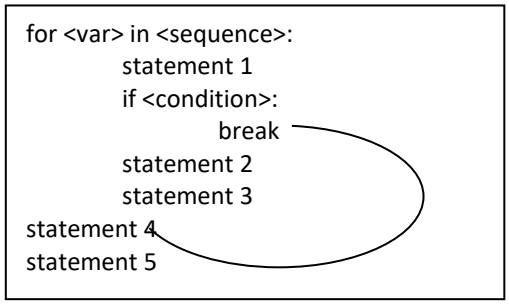
Syntax of while Loop

while test_condition:
    body of while

Break and Continue Statement

In certain situations, when some particular condition occurs, we may want to exit from a loop (come out of the loop forever) or skip some statements of the loop before continuing further in the loop. These requirements can be achieved by using break and continue statements, respectively.





STRINGS IN PYTHON

Python strings are characters enclosed in quotes of any type – single quotation marks, double quotation marks and triple quotation marks. An empty string is a string that has 0 characters. Python strings are immutable.

Strings are sequence of characters, where each character has a unique position-id/index. The indexes of a string begin from 0 to (length -1) in forward direction and -1,-2,-3,....,-length in backward direction.

STRING SLICES

In Python, the term 'string slice' refers to a part of the string, where strings are sliced using a range of indices. That is, for a string say name, if we give name[n:m] where n and m are integers and legal indices, Python will return a slice of the string by returning the characters falling between indices n and m starting at n, n+1, n+2, ... till m-1.

	0	1	2	3	4	5	6
word	a	m	a	z	i	n	g
	-7	-6	-5	-4	-3	-2	-1

Then,

word[0:7] *will give* *'amazing'*
word[0:3] *will give* *'ama'*
word[2:5] *will give* *'azi'*
word[-7:-3] *will give* *'amaz'*
word[-5:-1] *will give* *'azin'*

In a string slice, you give the slicing range in the form [<begin-index>:<last>]. If, however, you skip of the begin-index or last, Python will consider the limits of the string, i.e., for missing begin index, it will consider 0 (the first index) and for mission last value, it will consider length of the string. Consider the following examples to understand this:

word[:7] *will give* *'amazing'*
word[:5] *will give* *'amazi'*
word[3:] *will give* *'zing'*
word[5:] *will give* *'ng'*

Note: Using the same string slicing technique, you will find that for any index n, s[:n]+s[n:] will give you original string s.

STRING FUNCTIONS AND METHODS

Every string object that you create in Python is actually an instance of String class. The string manipulation methods that are being discussed below can be applied to string as per following syntax:

<stringObject>.<methodname>( )

1. **string.capitalize():** Returns a copy of the string with its first character capitalized

   Exmple: 'true'.capitalize( ) will return 'True'

   'i love my India'.capitalize( ) will return 'I love my India'

2. **string.title():** Returns a copy of the string with first character of each work capitalized.

   Example: 'true'.title( ) will return 'True'

   'i love my india'.capitalize( ) will return 'I Love My India'

3. **string.upper():** Returns a copy of the string converted to uppercase. Examples:

   string.upper( ) will return 'HELLO'

   string2.upper( ) will return 'THERE'

   string3.upper( ) will return 'GOLDY'

4. **string.lower():** Returns a copy of the string converted to lowercase. Examples:

   string.lower( ) will return 'hello'

   string2.lower( ) will return 'there'

   string3.lower( ) will return 'goldy'

5. **string.count(str):** Returns the count of an string in the given string. Examples:

   'I love my india'.count('i') will return 2

   'it goes as – ringa ringa roses'.count('ringa') will return 2

6. **string.find(sub[,start,end]):** Returns the lowest index in the string where the substring sub is found within the slice range of start and end. Returns -1 if sub is not found. Example:

   string = 'it goes as – ringa ringa roses'

   sub = 'ringa'

   string.find(sub) will return 13

   string.find(sub,15,22) will return -1

   string.find(sub,15,25) will return 19

7. **string.index(str):** Returns the lowest index in the sting where the substring is found. Example:

   'I love my India'.index('o') will return 3

   'I love my India'.index('my') will return 7

8. **string.isalnum():** Returns True if the characters in the string are alphanumeric (alphabets or numbers) and there is at least one character, False otherwise. Example:

   string ="abc123"

   string2 = 'hello'

   string3 = '12345'

   string4 = ' '

   string.isalnum( ) will return True

   string2.isalnum( ) will return True

   string3.isalnum( ) will return True

   string4.isalnum( ) will return False

9. **string.islower():** Returns True if all cased characters in the string are lowercase. Examples:

   string = 'hello'

   string2 = 'THERE'

   string3 = 'Goldy'

   string.islower( ) will return True

   string2.islower( ) will return False

   string3.islower( ) will return False

10. **string.isupper():** Returns True if all cased characters in the string are uppercase. Examples:

    string.isupper( ) will return False

    string2.isupper( ) will return True

    string3.isupper( ) will return False

11. **string.isspace():** Returns True if there are only whitespace characters in the string. Examples:

string = “ “
string2 = “”
string.isspace( ) will return True
string2.isspace( ) will return False

12. **string.isalpha():** Returns True if all characters in the string are alphabetic and there is at least one character, False otherwise. Example:
    string.isalpha( ) will return False
    string2.isalpha( ) will return True
    string3.isalpha( ) will return False
13. **string.isdigit():** Returns True if all the characters in the string are digits. There must be at least one character, otherwise it returns False. Example:
    string.isdigit( ) will return False
    string2.isdigit( ) will return False
    string3.isdigit( ) will return True
14. **string.split([<sep>]):** This function splits the string to form a list of strings.
    If we do not provide any argument to split then by default it will split the given string considering whitespace as a separator, e.g.,
    “I Love Python”.split( ) will give [‘I’, ‘Love’, ‘Python’]
    If we provide a string or a character as an argument to split( ), then the given string is divided into parts considering the given string/character as separator and separator character is not included in the split strings, e.g.,
    “I Love Python”.split(‘o’) will give [‘I L’, ’ve Pyth’, ’n’]
15. **string.partition(<sep>):** The partition() method searches for a specified string, and splits the string into a tuple containing three elements. The first element contains the part before the specified string. The second element contains the specified string. The third element contains the part after the string.
    Example: ‘I Love my India’.partition(‘my’) will give (‘I Love ’, ‘my’, ‘ India’)
16. **string.lstrip([chars]):** Returns a copy of the string with leading characters removed.
    If used without any argument, it removes the leading whitespaces.
    One can use optional chars argument to specify a set of characters to be removed.
    The chars argument is not a prefix; rather, all combinations of its values (all possible substrings from the given string argument chars) are stripped when they lead the string.
    Examples:
    string = “hello”
    string.lstrip( ) will return ‘hello’
    string2 = ‘There’
    string2.lstrip(‘the’) will return ‘There’
    string2.lstrip(‘The’) will return ‘re’
    string2.lstrip(‘he’) will return ‘There’
    string2.lstirp(‘Te’) will return ‘here’
    string2.lstrip(‘Teh’) will return ‘re’
    string2.lstrip(‘heT’) will return ‘re’
    “saregamapadhanisa”.lstrip(“tears”) will return ‘gamapadhanisa’
    “saregamapadhanisa”.lstrip(“races”) will return ‘gamapadhanisa’
17. **string.rstrip([chars]):** Returns a copy of the string with trailing characters removed.
    If used without any argument, it removes the trailing whitespaces.
    The chars argument is a string specifying the set of characters to be removed.
    The chars argument is not a suffix; rather, all combinations of its values are stripped.
    Examples:
    string = ‘hello’
    string.rstrip( ) will return ‘hello’
    string2 = ‘There’
    string2.rstripe(‘ere’) will return ‘Th’

string2.rstrip('care') will return 'Th'

string2.rstrip('car') will return 'there'
"saregamapadhanisa".rstrip("tears") will return "saregamapadhani"
"saregamapadhanisa".rstrip("races") will return "saregamapadhani"

18. **string.strip([chars]):** Returns a copy of the string with both leading and trailing characters removed. If used without any argument, it removes leading and trailing whitespaces. The chars argument is a string specifying the set of characters to be removed. The chars argument is not a suffix; rather, all combinations of its values are stripped.
    Examples:
    string = ' hello '
    string.strip() will return 'hello'
    string2='xxThis is a stringxx'
    string2.strip('x') will return 'This is a string'
19. **<str>.replace(<old string>,<new string>):** This functions replaces all occurrences of <old string> with <new string> in the given string, e.g.,
    "I Love Python".replace("Python","Programming") will give 'I Love Programming'
20. **len(string):** One more function that you have used with string is len() function which gives you the length of the string as the count of characters contained in it. Recall that you use it as: len(<string>)
    For example,
    string='hello'
    len(string) will return 5

LISTS IN PYTHON

The Python lists are containers that are used to store a list of values of any type. Python lists are mutable i.e., you can change the elements of a list in place. Which means Python will not create a fresh list when you make changes to an element of a list. List is a type of sequence like strings and tuples.

Difference from Strings

You cannot change individual elements of a string in place, but Lists allow you to do so. That is, following statement is fully valid for Lists:

L[i] = <element>

For example, consider the same vowels list crated above. Now if you want to change some of these vowels, you may write something as show below:

```
vowels[0] = 'A'
print(vowels)
['A','e','i','o','u']
```

List Functions

1. len() function

This function returns the length of a list i.e. this function returns number of elements present in the list. It is used as per following format:

len(<list>)

For example for a list L1 = [13,18,11,16,18,14]

len(L1) will return 6

2. list() function

This function converts the passed argument to a list. The passed argument could be a string, a list or even a tuple. It is used as per following format:

list(<argument>)

For example for a string s = "Computer"

list(s) will return ['C', 'o', 'm', 'p', 'u', 't', 'e', 'r']

3. The append() function

The append( ) function adds an item to the end of the list. It works as per following syntax:

List.append(<item>)

For example, to add a new item "yellow" to a list containing colours, you may write:

```
colours =["red","green","blue"]
colours.append("yellow")
print(colours)
["red","green","blue","yellow"]
```

4. The extend() function

The extend( ) method is also used for adding multiple elements (given in the form of a list) to a list. The extend( ) function works as per following format:

List.extend(<list>)

That is extend( ) takes a list as an argument and appends all of the elements of the argument list to the list object on which extend( ) is applied. Consider following example:

```
t1=['a','b','c']
t2=['d','e']
t1.extend(t2)
print(t1)
['a','b','c','d','e']
print(t2)
['d','e']
```

5. The insert() function

If you want to insert an element somewhere in between or any position of your choice, both append( ) and extend( )are of no use. For such a requirement insert( ) is used.

The insert( ) function inserts an item at a given position. It is used as per following syntax:

List.insert(<pos>,<item>)

The first argument <pos> is the index of the element before which the second argument <item> to be added. Consider the following example:

```
t1=[‘a’,’e’,’u’]
t1.insert( 2,’i' )
print( t1 )
[‘a,’e’,’i',’u’]
```

For function insert( ), we can say that:

list.insert(0,x) will insert element x at the front of the list i.e. at index 0.

list.insert(len(list),x) will insert element x at the end of the list i.e. index equal to length of the list

6. The count() function

This function returns the count of the item that you passed as argument. If the given item is not in the list, it returns zero. It is used as per following format:

List.count(<item>)

For instance:

```
L1 = [13,18,20,10,18,23]
print( L1.count( 18 ) )
2
print( L1.count( 28 ) )
0
```

7. The Index() function

This function returns the index of first matched item from the list. It is used as per following format:

List.index(<item>)

For example, for a list L1 = [13,18,11,16,18,14]

```
print( L1.index( 18 ) )
1
```

However, if the given item is not in the list, it raises exception ValueError.

8. The remove() function

The remove( ) method removes the first occurrence of given item from the list. It is used as per following format:

List.remove(<value>)

The remove( ) will report an error if there is no such item in the list. Consider the example:

```
t1=[‘a’,’e’,’i',’p’,’q’,’a’,’q’,’p’]
t1.remove( ‘a’ )
print( t1 )
[’e’,’i',’p’,’q’,’a’,’q’,’p’]
t1.remove( ‘p’ )
print( t1 )
[’e’,’i',’q’,’a’,’q’,’p’]
print( t1.remove( ‘k’ ) )
ValueError
```

9. The pop() method

The pop( ) is used to remove the item from the list. It is used as per the following syntax:

List.pop(<index>)

Thus, pop( ) removes an element from the given position in the list, and return it. If no index is specified, pop( ) removes and returns the last item in the list.

```
t1 = [‘k’,’a’,’i',’p’,’q’,’u’]
ele = t1.pop( 0 )
print( ele )
‘k’
```

10. The reverse() function

The reverse( ) reverses the item of the list. This is done "in place" i.e. id does not create a new list. The syntax to use reverse method is:

List.reverse( )

For example:

```
t1 = ['e','i','q','a','q','p']
t1.reverse( )
print(t1)
['p','q','a','q','i','e']
```

11. The sort() function

The sort( ) function sorts the items of the list, by default in increasing order. This is done "in place" i.e. it does not create a new list. It is used as per following syntax:

List.sort( )

For example:

```
t1 = ['e','i','q','a','q','p']
t1.sort( )
print(t1)
['a','e','i','p','q','q']
```

To sort a lit in decreasing order using sort( ), you can write:

List.sort(reverse=True)

12. min() function

This function returns the minimum value present in the list. This function will work only if all elements of the list are numbers or strings. This function gives the minimum value from a given list. Strings are compared using its ordinal values/Unicode values. This function is used as per following format:

min(<list>)

For example L1 = [13,18,11,16,18,14] and L2 = ['a', 'e' 'i', 'o' ,'U'] then

min(L1) will return 11 and min(L2) will return 'U'

13. max() function

This function returns the maximum value present in the list. This function will work only if all elements of the list are numbers or strings. This function gives the maximum value from a given list. Strings are compared using its ordinal values/Unicode values. This function is used as per following format:

max(<list>)

For example L1 = [13,18,11,16,18,14] and L2 = ['a', 'e' 'i', 'o' ,'U'] then

max(L1) will return 18 and max(L2) will return 'o'

14. sum() function

This function returns the total of values present in the list. This function will work only if all elements of the list are numbers. This function gives the total of all values from a given list. This function is used as per following format:

sum(<list>)

For example L1=[13,18,11,16,18,14] then sum(L1) will return 90

15. The clear() function

This method removes all the items from the list and the list becomes empty list after this function. This function returns nothing. It is used as per following format:

List.clear( )

For instance:

```
L1=[2,3,4,5]
L1.clear( )
print(L1)
[]
```

Introduction to Python Tuples

Python tuples are immutable i.e. you cannot change the elements of a tuple in place; Python will create a fresh tuple when you make changes to an element of a tuple.

Unpacking Tuples

Creating a tuple from a set of values is called packing and its reverse i.e., creating individual values from a tuple's element is called unpacking.

Unpacking is done as per syntax:

<variable1>,<variable2>,<variable3>,.... = t

where the number of variables in the left side of assignment must match the number of elements in the tuple. For example, if we have a tuple as:

t = (1, 2, 'A', 'B')

The length of above tuple t is 4 as there are four elements in it. Now to unpack it, we can write

w,x,y,z = t

Python will now assign each of the elements of tuple t to the variables on the left side of assignment operator. That is, you can now individually print the values of these variables somewhat like:

```
print(w)
print(x)
print(y)
print(z)
```

The above code will yield the result as

```
1
2
'A'
'B'
```

Tuple functions

1. The len() funtion

This method returns length of tuple i.e. the count of elements in the tuple. Its syntax is:

len(<tuple>)

For example:

```
emp = ('John', 10000, 24, 'Sales')
print(len(emp))
4
```

2. The max() function

This method returns the element from the tuple having maximum value. Its syntax is:

max(<tuple>)

Example:

```
tp1 = (10,12,14,20,22,24,30,32,34,-2)
print(max(tp1))
34
tp2 = ("Karan", "Zubin", "Zara", "Ana")
print(max(tp2))
Zubin
```

Please note that max() applied on sequences like tuples/lists etc. will return a maximum value ONLY IF the sequence contains values of same type.

3. The min() function

This method returns the element from the tuple having minimum value. Its syntax is:

min(<tuple>)

Example:

```
tp1 = (10,12,14,20,22,24,30,32,34,-2)
print(min(tp1))
-2
tp2 =("Karan", "Zubin", "Zara", "Ana")
```

```
print(min(tp2))
Ana
```

Like max( ), for min( ) to work, the element of tuple should be of same type.

4. The index() function

The index( ) works with tuples in the same way it works with lists. That is, it returns the index of an existing element of a tuple. It is used as:

```
<tuplename>.index(<item>)
```

Example:

```
t1 =(3,4,5,6.0)
print(t1.index(5))
2
```

5. The count() function

The count( ) method returns the count of a member element/object in a given sequence (list/tuple). You can use the count( ) function as per following syntax:

```
<sequence name>.count(<object>).
```

Example:

```
t1=(2,4,2,5,7,4,8,9,9,11,7,2)
print(t1.count(2))
3
t1.count(7)
2
```

For an element not in tuple, it returns 0.

6. The tuple() function

This method is actually constructor method that can be used to crate tuples from different types of values. Syntax:

```
tuple(<sequence>)
```

Example:

a. Creating empty tuple

```
>>>tuple( )
( )
```

b. Creating a tuple from a string

```
t = tuple("abc")
print(t)
('a','b','c')
```

c. Creating a tuple from a list

```
t = tuple([1,2,3])
print(t)
(1,2,3)
```

d. Creating a tuple from keys of a dictionary

```
t1 = tuple({1:"1", 2:"2"})
print(t1)
(1,2)
```

7. The sorted() function

This function is used to take a tuple as argument and converts this tuple to a sorted list. It has another argument called reverse. If reverse is set to True then tuple is sorted in descending order otherwise tuple will be sorted in ascending order. Syntax:

```
sorted(<tuple>[,reverse = True])
t1 =(3,4,5,6,0)
print(sorted(t1))
[0, 3, 4, 5, 6]
print(sorted(t1, reverse = True))
[6, 5, 4, 3, 0]
```

Indirectly Modifying Tuples

(a) Using Tuple Unpacking

Tuples are immutable. To change a tuple, we would need to first unpack it, change the values, and then again repack it:

```
tp1 = (11,33,66,99)
1. First unpack the tuple
a,b,c,d = tp1
2. Redefine or change desired variable say, c
c=77
3. Now repack the tuple with changed value
tp1 = (a,b,c,d)
```

(b) Using the constructor functions of lists and tuples i.e., list() and tuple()

There is another way of doing the same as explained below:

```
tp1 = ("Anand",35000,35,"Admin")
1. Convert the tuple to list using list( ):
lst = list(tp1)
2. Make changes in the desired element in the list
lst[1] = 45000
3. Create a tuple from the modified list with tuple( )
   tp1 = tuple(lst)
```

Dictionary

Dictionaries are mutable unordered collections with elements in the form of a {key:value pairs that associate keys to values.

Characteristics of a Dictionary

1. **Unordered Set:** A dictionary is a unordered set of key:value pairs. Its values can contain references to any type of object.
2. **Not a sequence:** Unlike a string, list and tuple, a dictionary is not a sequence because it is unordered set of elements.
3. **Indexed by Keys, Not Numbers:** Dictionaries are indexed by keys and not by any index like in sequences.
4. **Keys must be unique:** Each of the keys within a dictionary must be unique. Since keys are used to identify values in a dictionary, there cannot be duplicate keys in a dictionary. However, two unique keys can have same values, e.g. consider the BirdCount dictionary here:

```
BirdCount = {"Finch":10, "Myna":13, "Parakeet":16, "Hornbill":15, "Peacock":15}
```

5. **Mutuable:** Like lists, dictionaries are also mutable. We can change the value of a certain key "in place" using the assignment as per syntax:

```
<dictionary>[<key>] = <value>
For example,
>>>dict1["3"]
"Yamuna"
>>>dict1["3"] = "Ganga"
>>>dict1["3"]
'Ganga'
```

6. **Internally stored as Mappings:** Internally, the key:value pairs of a dictionary are associated with one another with some internal function (called hash function).this way of linking is called mapping.

Dictionary functions

1. The len() function

This method returns length of the dictionary, i.e., the count of elements (key:value pairs) in the dictionary. The syntax to use this method is given below:

len (<dictionary>)
For example:
Employee = {'name':'John', 'salary':10000, 'age':24}
print (len (Employee))
3

2. The clear() function

This method removes all items from the dictionary and the dictionary becomes empty dictionary. The syntax to use this method is given below:

<dictionary>.clear ( )
Example:
Employee = {'name':'John', 'salary':10000, 'age':24}
Employee.clear ( )
print (Employee)
{}

3. The get() function

With this method, you can get the item with the given key, similar to dictionary[key], If the key is not present Python by default gives error, but you can specify your own message through default argument as per following syntax:

<dictionary>.get (<key>,[default])
Example:
Employee = {'name':'John', 'salary':10000, 'age':24, 'dept':'Sales'}
print (Employee.get ('dept'))
Sales
print (Employee.get ('designation'))
NameError:name 'designation' is not defined
>>>Employee.get ('designation', "Error! Key not found")
Error! Key not found

4. The items() function

This function returns all of the items in the dictionary as a sequence of (key, value) tuples. Note that these are returned in no particular order

<dictionary>.items ( )
Example:
Employee = {'name':'John', 'salary':10000, 'age':24}
myList = employee.items ( )
for x in myList:
    print (x)
The output of the above code will be like:
('salary', 10000)
('age', 24)
('name', 'John')

5. The keys() method

This method returns all of the keys in the dictionary as a sequence of keys in form of a list. Syntax to use this method is:

<dictionary>.keys ( )
Example:
Employee = {'name':'John', 'salary':10000, 'age':24}
print (Employee.keys ( ))
['salary','age','name']

6. The values() function

This method returns all the values from the dictionary as a list. The syntax to use this method is given below:
<dictionary>.values ( )

Example

```
Employee = {'name':'John', 'salary':10000, 'age':24}
print(Employee.values())
['Jhon',10000,24,]
```

7. The update() function

This function merges key:value pairs from the new dictionary into the original dictionary, adding or replacing as needed. The items in the new dictionary are added to the old one and override (overwrite) any item already there with the same keys. The syntax to use this method is given below:

```
<dictionary>.update(<other-dictionary>)
```

Example:

```
Employee1 = {'name':'John', 'salary':10000, 'age':24}
Employee2 = {'name':'Diya', 'salary':54000, 'dept':'Sales'}
Employee1.update(Employee2)
print(Employee1)
{'salary':54000, 'dept':'Sales', 'name':'Diya', 'age':24}
```

8. The fromkeys() function

This method creates a dictionary from the given sequence of keys and a value. It assigns same value for all keys. If value is not given then it assigns None as the value of all keys. Its syntax is:

```
<dict-var> = dict.fromkeys(<key-sequence> [,<value>])
```

For example:

```
month = ['Jan', 'Mar', 'May']
d1 = dict.fromkeys(month, 31)
print(d1)
```

will give us:

```
{'Jan': 31, 'Mar': 31, 'May': 31}
```

and

```
d2 = dict.fromkeys(month)
print(d2)
```

will give us:

```
{'Jan': None, 'Mar': None, 'May': None}
```

9. The copy() function

This method creates a copy of the dictionary. This method does not make any change in the original dictionary. It only makes a copy of this dictionary. Its syntax is:

```
<dict-var> = <original-dict>.copy()
```

For example:

```
d1 = {'Jan':31, 'Feb':28, 'Mar':31}
d2 = d1.copy()
print(d2)
```

will give us:

```
{'Jan':31, 'Feb':28, 'Mar':31}
```

10. The pop() function

Like lists pop() method removes an element from a dictionary. This method removes a key:value pair from the dictionary and returns the value removed. For this a key need to be specified. This method also has an optional argument for default value if the key is not present in the dictionary. Its syntax is:

```
<dict>.pop(<key>[,<default-value>])
d1 = {'Jan':31, 'Feb':28, 'Mar':31}
print(d1.pop('Jan'))
31
d1.pop('Jul',"Element not present")
Element not present
```

11. The popitem() function

In Python 3.7 and higher version this method of dictionary removes the last inserted key:value pair from the dictionary and return it as a tuple. Its syntax is:

```
<dict>.popitem( )
```

For example:

```
d1 = {'Jan':31, 'Feb':28, 'Mar':31}
print(d1.popitem( ))
('Mar', 31)
```

12. The setdefault() method

This method of dictionary takes two arguments key and default-value. If key is found in the dictionary then it returns its corresponding value. If key is not found in the dictionary then it inserts the default-value with key in the dictionary and returns default-value. If default-value is not given then None is inserted as default-value of the key and returns nothing. Its syntax is:

```
<dict>.setdefault(<key>[,<default-value>])
```

For example:

```
>>>d1={'Jan':31, 'Feb':28, 'Mar':31}
>>>d1.setdefault('Jan')
31
>>>d1.setdefault('Apr',30)
30
>>>d1.setdefault('May')
>>>d1
{'Jan': 31, 'Feb': 28, 'Mar': 31, 'Apr': 30, 'May': None}
```

13. The max() function

This function when applied with dictionary returns the maximum key value of all keys of dictionary.

For example:

```
d1={'Jan':31, 'Feb':28, 'Mar':31}
print(max(d1))
'Mar'
```

14. The min() function

This function when applied with dictionary returns the smallest key value of all keys of dictionary.

For example:

```
d1={'Jan':31, 'Feb':28, 'Mar':31}
print(min(d1))
'Feb'
```

15. The sorted() function

This function returns the keys of the dictionary in ascending order in the form of a list.

For example:

```
d1={'Jan':31, 'Feb':28, 'Mar':31}
sorted(d1)
['Feb', 'Jan', 'Mar']
```

For getting result in descending order use reverse=True with sorted( ) function.

```
sorted(d1,reverse=True)
['Mar', 'Jan', 'Feb']
```

Functions

Definition: Function is a named sequence of statements used to perform specific task when it is invoked. Functions may or may not return value. It contains statements, which are sequentially executed from top to bottom by python Interpreter. Once defined, a function can be called repeatedly from different places of the program without writing same code of that function every time, or it can be called from inside another function, by simply writing the name of the function and passing the required parameters, if any

Advantages of Using a **Function**

1) Use of **functions** enhances the readability of a program.

2) A big code is always difficult to read. Breaking the code in smaller parts called **Functions,** keeps the program organized, easy to understand and makes it reusable.

3) Functions are used to achieve modularity and reusability.

Python Functions can be divided into three categories:

1. Functions in Modules
2. Build-in Functions
3. User Defined Functions

1) Fuynctions in Modules

Module is a file containing python functions and statements. Standard library of python is prolonged as module(s). We can use these modules in our python code, for this, a programmer needs to import the module.

There are 2 ways to import modules:-

i) By using import

It is simple & most commonly used way to use modules in python code.

Syntax:-

import modulename1 [, modulename2,…….]

Example:-

>>> import math

On execution of import math statement, python will-

a) Search 'math.py' file in library
b) Space is allocated for module definition & variable creation
c) Statements are executed in the module

Example:-Write python statements in Interactive mode to find square root of 25

>>> import math

>>>v=math.sqrt (25)

In above example 5.0 will be stored in v

ii) By using from

It is used to get a specific function instead of the complete module file. If we know beforehand which function(s), we will need in code, then we may use **from**. For modules having large number of functions, it is recommended to use **from** instead of import.

Syntax :-

>>> from modulename import functionname [, functionname…..]

Example

>>> from math import sqrt

>>> sqrt(25)

Output: 5.0

Here, we are importing sqrt() function only, instead of the complete math module.

We can also use

from modulename import *

will import everything from the file.

Python standard Library

1) math module

We can use following functions as it is in python code that are available in math module

Name of the function	**Description**	**Example**
math.ceil(x)	It returns the smallest integer not less than x, where *x is a numeric expression.* **Or in short it returns next higher integer**	math.ceil(4.6) **5** math.ceil(-3.1) **-3** math.ceil(3.3) **4**
math.floor(x)	It returns the largest integer not greater than x, where *x is a numeric expression.* **Or in short it returns previous lower integer**	math.floor(4.6) **4** math. floor (3.1) **-4**
math.fabs(x)	It returns the absolute	math.fabs(- 5.17)

	value of x, *where x is a numeric value.*	**5.17** math.fabs(10.12) **10.12** math.fabs(1.72) **1.72**
math.pow(x, y)	It returns the value of $(x)^y$, *where x and **y** are numeric expressions.*	math.pow(3, 2) **9.0** math.pow(2, 0) **1.0** math.pow(2, 4) **16.0**
math.sqrt (x)	It returns the square root of x for x > 0, where x is a numeric expression.	math.sqrt(100) **10.0** math.sqrt(36) **6.0**
pi	pi is a constant provided by math module. It gives the value of π in float form with 15 digits after decimal point.	>>>math.pi 3.141592653589793
e	e is a constant provided by math module. It gives the value of Euler's number in float form with 15 digits after decimal point.	>>>math.e 2.718281828459045
sin(<radian>)	This method returns the sine of value passed to it. Value to be passed need to be given in radians and value returned will always be in float.	>>>x=math.pi/3 >>>math.sin(x) 0.8660254037844386
cos(<radian>)	This method returns the cosine of value passed to it. Value to be passed need to be given in radians and value returned will always be in float	>>>x=math.pi/3 >>>math.cos(x) 0.5000000000000001
tan(<radian>)	This method returns the tangent of value passed to it. Value to be passed need to be given in radians and value returned will always be in float.	>>>x=math.pi/3 >>>math.tan(x) 1.7320508075688767

Some functions from random module:

Name of the function	**Description**	**Example**
random ( )	It returns a random float x, such that 0 ≤ x<1	>>>random.random ( ) **0.281954791393** >>>random.random ( ) **0.309090465205**

randint (a, b)	It returns a int x between a & b such that
	a ≤ x ≤ b
		>>> random.randint (1,10)
		5
		>>> random.randint (-2,20)
		-1

randrange(<start>,<stop>,<step>)	This method generates a random integer in the range from <start> and <stop>-1 in the gap of <step>. In other words, this method first generated a list of numbers from <start> to <stop>-1 with the gap of <step>. After that a random number from that list is chosen. So, we can say that this function first performs the job of range() function then random() function.	>>>random.randrange(35) 10 #This will generate a random integer between 0 and 35 >>>random.randrange(15,35) 28 #This will generate a random integer between 15 and 35 >>>random.randrange(15,35,5) 30 #This will generate a random integer from [15,20,25,30]

Some functions from statistics module:

Name of the function	**Description**	**Example**
mean()	This method is used to find the mean of the given data. It takes one argument in the form of list/tuple containing numbers. This method calculates mean and returns it in float form	>>>x=[5,15,20,25,30,40] >>>statistics.mean(x) 22.5
median()	This method is used to find the median of the given data. It takes one argument in the form of list/tuple containing numbers. This method calculates median and returns it in float form. The advantage of using this method is that list/tuple passed as argument need not to be sorted. median() method will automatically sort it and calculate the mean	>>>x=[18, 46, 4, 1, 20, 21] >>>statistics.median(x) 19.0
mod()	This method is used to find the mode of the given data. It takes one argument in the form of list/tuple containing numbers. This method calculates mode and returns it in float form	>>>x= [1, 2, 3, 4, 4, 4, 4, 5, 6, 7, 7, 7, 8] >>>statistics.mode(x) 4

2) Built –in- These functions are built into Python and can be accessed by a programmer. We don't have to import any module (file) to these functions.

Following are some built-in functions in python:-

Name of the function	**Description**	**Example**
abs (x)	It always gives positive numeric value in answer.	>>>abs(-4) **4** >>>abs(119L) **119** >>> abs(100) **100**

max(x, y, z, ...)	It returns the largest of its arguments: where x, y and z are numeric variable	>>>max(8, 10, 100) **100** >>>max(-80, -20, -10) **-10**

min(x, y, z, ...)	It returns the smallest of its arguments; where x, y, and z are numeric variable	>>> min(8, 10, 100)
		8
		>>> min(-80, -20, -10)
		-80

len (s)	Return the length (the number of items) of an object. The argument may be a sequence (string, tuple or list) or a mapping (dictionary).	>>> a= [1,2,3]
		>>>len (a)
		3
		>>> b= „Hello"
		>>> len (b)
		5

round(x [, n])	It returns float x rounded to n digits from the decimal point, *where x and n are numeric expressions.* If n is not provided then x is rounded to 0 decimal digits.	>>>round(80.23456, 2) **80.23** >>>round(-100.000056, 3) **-100.0** >>> round (80.23456) **80.0**

range (*start*, *stop*[, *step*])	It generates a list of numbers. It is often used in for loops. The arguments must be integers.
	If the *step* argument is omitted, it defaults to 1.
	If the *start* argument is omitted, it defaults to 0.
	If *step* is positive, the last element is the largest start + i * step less than *stop*;
	if *step* is negative, the last element is the smallest start + i * step greater than *stop*. *Step* must not be zero
		>>> range(10)
		[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
		>>> range(1, 11)
		[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
		>>> range(0, 30, 5)
		[0, 5, 10, 15, 20, 25]
		>>> range(0, 10, 3)
		[0, 3, 6, 9]
		>>> range(0, -10, -1)
		[0, -1, -2, -3, -4, -5, -6, -7, -8, -9]
		>>> range(0)
		[ ] empty list
		>>> range(1, 0)
		[ ] empty list

3) User defined-

User defined functions are those functions which are defined by the programmer for their convenience.

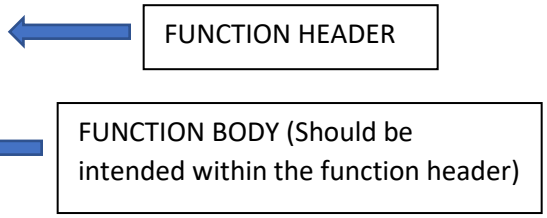
To define a function **def** keyword is used.

Syntax-

def <Function name> ([parameter 1, parameter 2,.....]) :

    Set of instructions to be executed

    [return <value>]



Some Important points to remember:-

- The items enclosed in "()" are called parameters and they are optional. Hence, a function may or may not have parameters.
- A function may or may not return a value.
- Function header always ends with a colon (:).
- Function name should be unique. Rules for naming identifiers also applies for function naming.
- The statements outside the function indentation are not considered as part of the function.

Parameters and Arguments

Parameters are the name(s) provided in the parenthesis when we write function header.

These are the values required by function to work.

Let's understand this with the help of function written for calculating area of circle. **radius** is a parameter to function area.

```
def area(radius):
    return(3.14*radius**2)
```

If there is more than one value required by the function to work on, then, all of them will be listed in parameter list separated by comma.

Arguments are the value(s) provided in function call/invoke statement. List of arguments should be supplied in same way as parameters are listed. Bounding of parameters to arguments is done 1:1, and so there should be same number and type of arguments as mentioned in parameter list and in the same sequence as well.

Example of argument in function call

```
>>> area (5)
```

5 is an argument. An argument can be constant, variable, or expression.

Scope of Variables

Scope of variable refers to the part of the program, where it is visible, i.e., area where you can refer (use) it. We can say that scope holds the current set of variables and their values. There are two types of scope of variables- global scope(variable) or local scope(variable).

Difference between global variable and local variable

Global Variable	Local variable
1) A variable that has global scope is known as global variable	1) A variable that has local scope is known as local variable
2) a variable that is defined outside any function or any block is known as a global variable	2) A variable that is defined inside any function or a block is known as a local variable
3) It can be accessed throughout the python code	3) It can be accessed only in the function or a block where it is defined.
4) Any change made to the global variable will impact all the functions in the program where that variable can be accessed.	4) Any change made to the local variable will not impact all the functions in the program where that variable can be accessed.
5) It exists throughout the program	5) It exists only till the function executes.

Example:

```
x = 5                    <-- Global variable
def try():
    x = 10               <-- Local variable
    print("local x:", x)
print("global x:", x)
```

Output is:

local x : 10

global x : 5

Default Parameter

A default value is a value that is predefined and assigned to the parameter when the function call does not have its corresponding argument.

Example:

```
def simple_interest(p, n, r=2):    <-- Here r is default parameter
    si = 0.0
    si = float(p*n*r)/float(100)
    return si
p = float(input("Enter p: "))
n = int(input("Enter n: "))
simple_interest = simple_interest (p,n)
```

print("Simple interest value: %.2f" % simple_interest)

Multiple Choice Questions

1) The place where a variable can be used is called its

a) area b) block
c) function **d) Scope**

2) What is the output of the following segment?

chr(ord('A'))

(A) A
(B) B
(C) a
(D) Error

Distinguish between Actual Parameter and Formal Parameter

Actual Parameter	Formal Parameter
1.Used in function call statement	1. Used in function header of the called function
2.Send value from calling function to called function	2.Receives value from actual parameter

Example: Actual parameters are= 1,2,3, formal parameters are=x,y,&z

```
def add3(x,y,x):
    print(x+y+z)
add3(1,2,3)
```

Programs using User defined Functions

1) Write a program with a user defined function to count the number of times a character (passed as argument) occurs in the given string.
Source code:

```
def charCount(ch,st):
   count = 0
   for character in st:
     if character == ch:
         count += 1
   return count
st = input("Enter a string: ")
ch = input("Enter the character to be searched: ")
count = charCount(ch,st)
print("Number of times character",ch,"occurs in the string is:",count)
```

Output:
Enter a string: Today is a Holiday
Enter the character to be searched: a
Number of times character a occurs in the string is: 3

2) Write a program with a user defined function with string as a parameter which replaces all vowels in the string with '*'.

Source code:

```
def replaceVowel(st):
    newstr = ''
    for character in st:
       if character in 'aeiouAEIOU':
            newstr += '*'
       else:
            newstr += character
    return newstr
st = input("Enter a String: ")
st1 = replaceVowel(st)
print("The original String is:",st)
print("The modified String is:",st1)
```

Output:
Enter a String: Hello World
The original String is: Hello World
The modified String is: H*ll* W*rld

3) Write a program which reverses a string passed as parameter and stores the reversed string in a new string. Use a user defined function for reversing the string.

Source code:

```
def reverseString(st):
      newstr = '' #create a new string
      length = len(st)
      for i in range(-1,-length-1,-1):
        newstr += st[i]
      return newstr

st = input("Enter a String: ")
st1 = reverseString(st)
print("The original String is:",st)
print("The reversed String is:",st1)
```

Output:
Enter a String: Hello World
The original String is: Hello World
The reversed String is: dlroW olleH

4) Write a program using a user defined function to check if a string is a palindrome or not. (A string is called palindrome if it reads same backwards as forward.
For example, Kanak is a palindrome.)

```
def checkPalin(st):
    i = 0
    j = len(st) - 1
    while(i <= j):
       if(st[i] != st[j]):
           return False
       i += 1
       j -= 1
   return True
st = input("Enter a String: ")
result = checkPalin(st)
if result == True:
      print("The given string",st,"is a palindrome")
else:
       print("The given string",st,"is not a palindrome")
```

Output 1:
Enter a String: kanak
The given string kanak is a palindrome

Output 2:
Enter a String: computer
The given string computer is not a palindrome

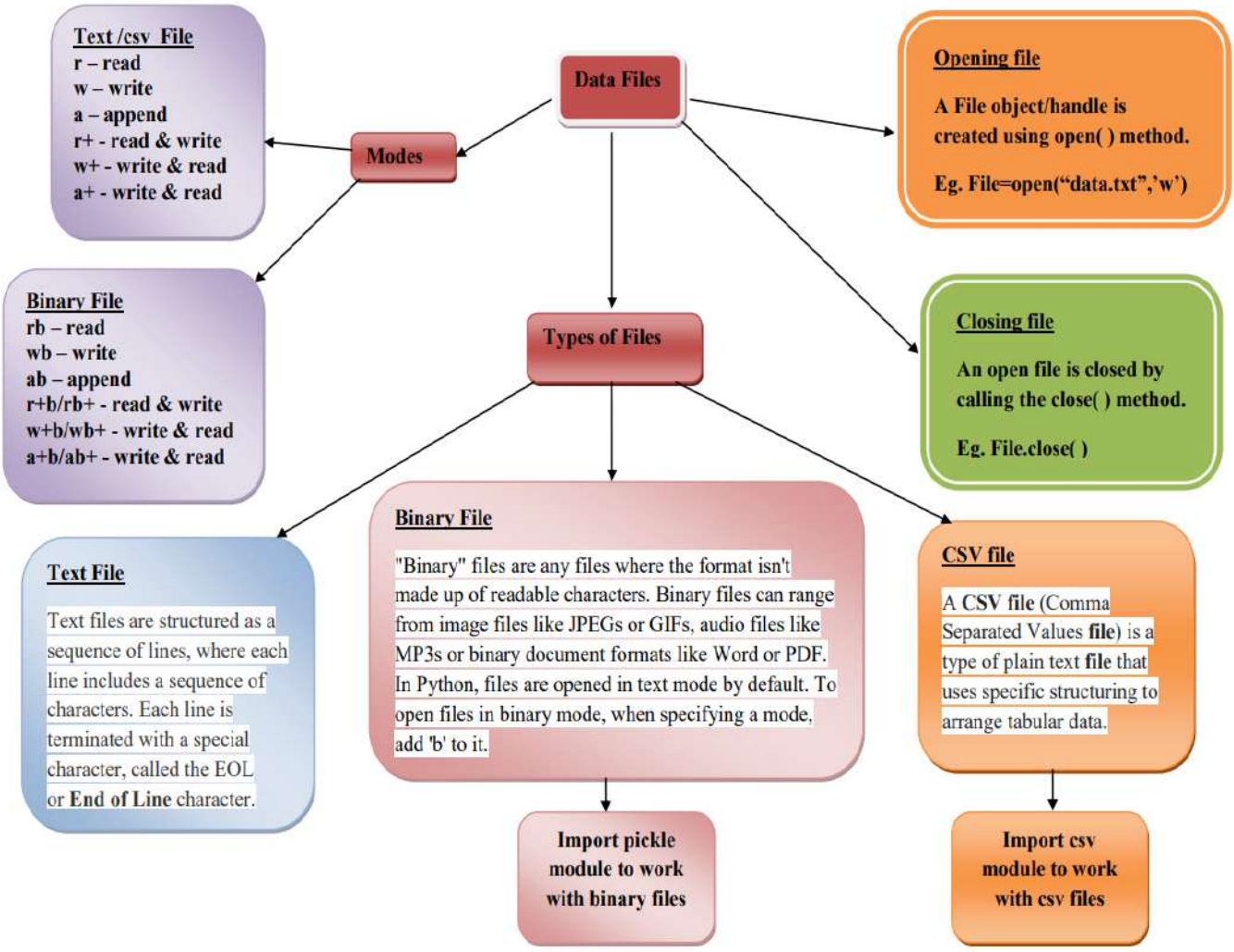
5) **Program to count no of ‘p’ in the string pineapple.**

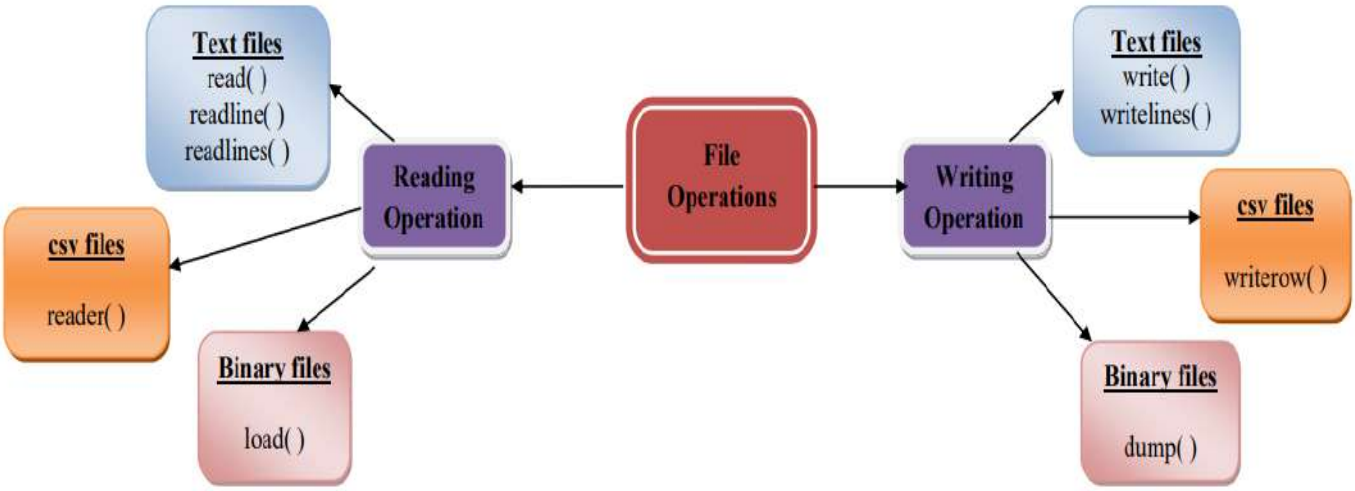
```
def lettercount():
     count = 0
     for letter in word:
          if letter == 'p':
              count = count + 1
     print(count)
word=input(‘Enter string:’)
lettercount()
```

Output is:
Enter string:applee
2

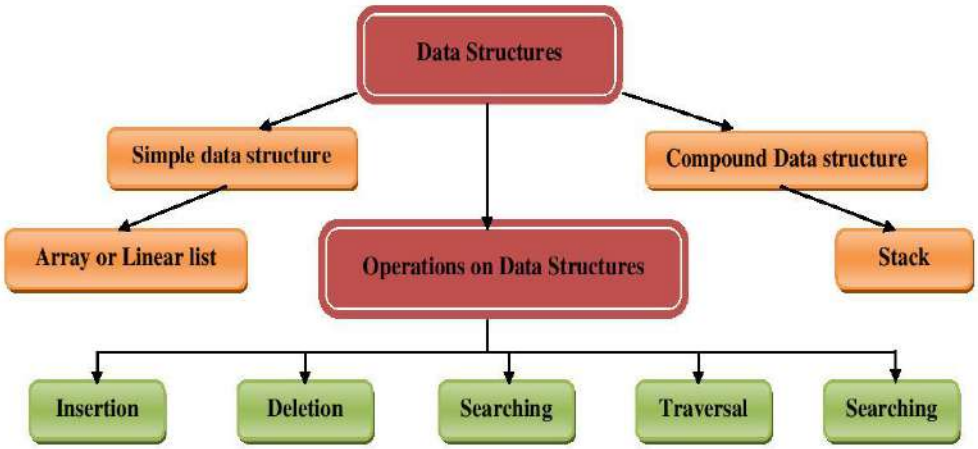
UNIT-I

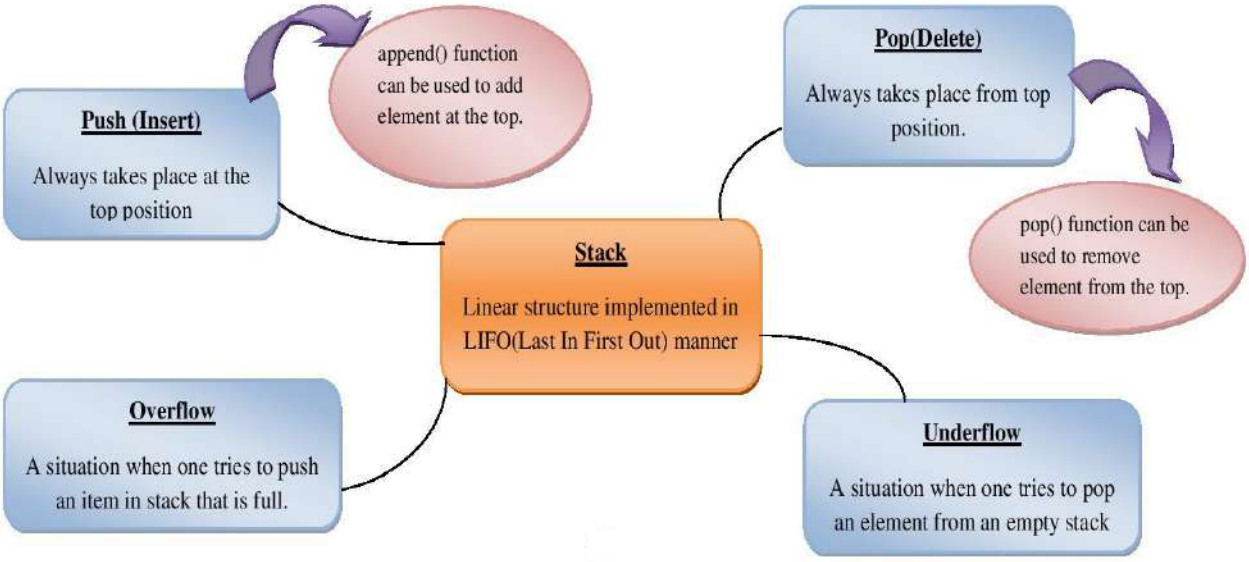
FILE HANDLING




File Operations
Reading Operation
Writing Operation
Text files
read( )
readline( )
readlines( )
csv files
reader( )
Binary files
load( )
Text files
write( )
writelines( )
csv files
writerow( )
Binary files
dump( )

DATA STRUCTURES





FILE HANDLING IN PYTHON

ABOUT FILE:

A file is a sequence of bytes contain data and store it on some storage device. File handling is an important part of any computer application.

NEED FOR FILE HANDLING

- ➔ To store data for future reference
- ➔ Sometime the output generated by a program is large thus file help to store that huge data.

TYPES OF FILES

Text Files:

A file whose contents can be viewed using a text editor is called a text file. A text file is simply a sequence of ASCII or Unicode characters. In text file, translation will take place after the EOL or delimiter is encountered. Thus, it is slower than binary file.

Binary Files:

A binary file stores the data in the same way as stored in the memory. In Binary file there is no delimiter for a line. The file contents returned by a binary file is raw i.e. with no translation, thus Binary files are faster than text files.

CSV Files:

CSV stands for Comma Separated Values. CSV is just like a text file, in a human readable format which is extensively used to store **tabular data**, in a spreadsheet or database. The separator character of CSV files is called a delimiter. Default delimiter is comma (,). Other delimiters are tab (\t), colon (:), pipe (|), semicolon (;) characters.

TEXT FILE Vs. BINARY FILES

Text Files	Binary Files

Stores data in ASCII or Unicode format so that text files are human readable.	Contains raw data so that not human readable.
Each line is delimited by EOL or end of Line (like \n).	No delimiter for a line
Slower than Binary File	Faster than text files

In Python, any type of File Handling consists the following three steps:

1. Opening of a file with specific mode. Using open () method / with statement of python.
2. Process file i.e perform read or write operation.
3. Close the file, if file has opened using open () method

STEPS TO PROCESS A FILE

1. Open the file by specifying file-path and file-mode(reading/writing)
    i. Reading purpose: If the data is to be brought in from a file to memory.
    ii. Writing purpose: If the data is to be sent from memory to file.
2. Assign its reference to a file object or file-handle.
3. Process the file as per requirement of program i.e perform the desired operation.
4. Close the file.

Opening a Text File

The first step of file handling is to open the file by specifying file-path and file-mode. If no file-mode is specified by default file will be open in reading mode.

Python has two ways to open a file: -

1) Using built in function **open()**
2) Using Python '**with**' statement

1) Using built-in function open() : -

Syntax: **<file_object_name> = open(<file_path>,<mode>)**

Example: **f = open("demo.txt","r")**

2) Using Python 'with' statement: -

Syntax: **with open(<file_path>, <mode>) as <file_object>:**

Example: **with open("demo.txt") as f:**

About File Object:

- It serves as a link to file residing in your computer.
- It is a reference to the file on the disk
- It helps to perform operations on the file.

Absolute Path:

- Absolute file paths are notated by a leading forward slash or drive label.

  Example C:\\KVSROMUMBAI\\demo.txt
- An absolute path, which always begins with the root folder.

Relative Path:

A relative path, is relative to the program's current working directory.

Example **'.\test.txt' or 'test.txt'**

File Modes (File Access Modes):

It indicates that for what purpose the file is being opened.

Text File Mode	Binary File Mode	Description	Purpose
"r"	"rb"	Read	Opens a file for reading, Shows error if the file does not exist. It is the default file-mode.

“w”	“wb”	Write	Opens a file for writing, creates the file if it does not exist. If the file exists, the previous contents will be lost.
“a”	“ab”	Append	Opens a file for appending, Old data will retain if file already exist. Creates the file if it does not exist.
“r+”	“rb+” or “r+b”	Read and Write	File must exist otherwise error is raised. Both reading and writing operations can take place.
“w+”	“wb+” or “w+b”	Write and Read	File is created if it does not exist. If the file exists previous data is truncated (removed). Both reading and writing operations can take place.
“a+”	“ab+” or “a+b”	Append and Read	File is created if it does not exist. If the file exists previous data is retained and the new data will be added at the end of the file. Both reading and writing operations can take place.

CLOSING A FILE: -

close() method is use to close the opened file. In python files are automatically close at the end of the program but it is advisable to close a file after the end of the program.

Syntax: <fileObject>.close()

Example : **f.close()**

Moreover, if file has opened using ‘with’ statement of python then it will automatically close after the nested block of code.

READING from a Text File: -

A Program can reads a text file from disk. The followings methods are used to read data from the text file:

1. read()
2. readline()
3. readlines()

1. **read() -** The read() method returns the whole text in the form of string. You can also specify how many characters you want to return by passing the size as argument.

Syntax: **<file_object>.read([n])** where n is the No. of bytes that we want to read from the file.

a) <file_object>.read() – It will read the whole file.

b) <file_object>.read(n) – It will read exactly n bytes from the beginning of the file.

Example:

```
f = open("demo.txt", "r")

print(f.read(15))       # Returns the first 15 characters of the file"demo.txt".
```

2. **readline() -** readline() method will return a line, if n is specified reads n bytes.

Syntax: <file_object>.readline()

Example

```
f = open("demo.txt", "r")

print(f.readline())              # It will read the first line

print(f.readline())              # It will read the next line and so on
```

3. **readlines() –** This method will **return a list of strings**, each separated by \n. readlines() can be used to read the entire content of the file.

Syntax: **<file_object>.readlines()**

It returns a list, which can then be used for manipulation.

Example: f = open("demo.txt", "r")

```
print(f.readlines())
```

Some Examples of Text File Handling: -

 # Program to print the first and last line of the text file abcd.txt

```
myf=open("abcd.txt","r")
lst=myf.readlines()
print(lst[0])        # Used to print the first line
print(lst[-1])       # Used to print the last line
myf.close()
```

 # Program to count No. of lines in a text file python.txt

```
myf=open("python.txt","r")
lst=myf.readlines()
print(len(lst))
myf.close()
```

 # Program to count a specific word "python" in a text file text_demo.txt

```
myf=open("text_demo.txt","r")
st=myf.read()
c=0
for i in st.split():
   if (i=="python" or i=="PYTHON" or i=="Python"):
      c=c+1
print("The word python occurs ", c , " times in the file.")
myf.close()
```

 # Program to print first n lines from the text file para.txt

```
myf=open("para.txt","r")
lst=myf.readlines()
n=int(input("Enter how many lines you wish to display"))
for i in range(0,n):
   print(lst[i])
```

```
myf.close()
```

 # Program to print n lines at the end from a text file abcd.txt

```
myf=open("abcd.txt","r")
lst=myf.readlines()
n =int(input('Enter how many lines you wish to print from last'))
for i in range(-1,-n-1,-1):
   print(lst[i])
myf.close()
```

 # Program to count total number of digits in a file myfile.txt

```
myf=open("myfile.txt","r")
x=myf.read()
c=0
for i in x:
  if(i.isdigit()):
     c=c+1
print('Total digits=',c)
myf.close()
```

Difference between read(), readline() and readlines():

The read() method reads data from a text file, and store its contents in a string type variable. It can either read the whole content from the file if any parameter is not passed inside read method, otherwise if n is passed inside read() the method will read n number of characters.

The readline() function reads data line by line from the text file. At a time it will return one line of data in the form of **string.**

The readlines() function reads all lines and return them in a list.

Assume the content of text file, 'portfolio.txt' is:

Samrat Roy
12-11-1999
AB+
NAGPUR

Now, carefully watch the given code and then identify the data type of record1 and record2?

```
file = open("portfolio.txt")
record1 = file.readlines()
file.close()
```

Ans: - Data type of record1 will be list.

```
file = open("portfolio.txt")
record2 = file.read()
file.close()
```

Ans: - Data type of record2 will be string.

 # Suppose the content of the file 'quotes.txt' is: -

All of us do not have equal talent.

But, all of us have an equal opportunity to develop our talents.

I am not handsome but I can give my hand to someone who needs help.

Because Beauty is required in the heart, not in face.

Now, tell what will be the output of the following code(s)?

```
FILE = open("quotes.txt")
LC = 0
```

```
DATA = FILE.readlines()
for L in DATA:
   if L[0] == 'B':
      LC += 1
print("No. of lines starts with B =",LC)
FILE.close()
```

Output:

No. of lines starts with B = 2

And, what will be the output of the following code: -

```
FILE = open("quotes.txt")
AC = 0
DATA = FILE.read()
for L in DATA:
   if L=='B':
      AC+=1
print("Total No. of alphabet B in the file =",AC)
FILE.close()
```

Output:

Total No. of alphabet B in the file = 3

WRITING into a text file: -

A Program can also write strings into a text file. Followings are the methods to write a data to the file:

write ()
writelines()

Note: - To write into a text file, we must add parameter as 'w' or 'a' in the open() function which specifies the file access mode :

"a" – for append the data at the end of the file

"w" – for overwrite any existing content and then write the new data

Difference between 'a' and 'w' modes i.e. append and write modes: -

If you open a file in "w" means write mode, Python overwrites an existing file or creates a new file. For an existing file, the earlier data gets removed.

If you want to write into a file with retaining the previous data, the file must be opened in "a" means append mode.

1) write() – This method takes a string (as parameter) and writes it in the file. For storing data with end of line character, we will have to add \n character to the end of the string.

Example:

```
# Open the file "demo.txt" and add content in it

f = open("demo.txt", "w")

f.write("Hello students\nUse this study material\nYou will get good marks!")

f.close()

# open the file and read the content of it
```

```
f = open("demo.txt", "r")

print(f.read())
```

```
# Open the previous file "demo.txt" and add more content to the file:

f = open("demo.txt", "a")

f.write("\nAll the Best.")

f.close()

# Now again open the file in read mode and see the result …. (Check by yourself)
```

2) writelines() - Drawback of write() function is it will write a string in a text file at a time, and it can't be used for writing a list, tuple etc. into a file. writelines() method will help to write a sequence of strings to the file. The sequence can be any object producing strings, typically a list of strings. So, whenever we have **to write a sequence of string / data type**, we will use writelines(), instead of write().

```
# Program showing use of writelines() method

        f = open("demo.txt", "w")
f.writelines(["Python is just amazing!", "\nWe love python"]) # here we used list data
        f.close()

#open and read the file after the appending

f = open("demo.txt", "r")
print(f.read())
```

flush() function: - The flush() function forces the writing of data on disc which was still pending in the output buffer.

Syntax : **<file_object>.flush()**

```
# Program to demonstrate the use of flush() function

f = open("demo_flush.txt","w+")
f.write("India is my country.\n")
f.flush()

# After some statements x = "Jai Hind"

x=”Jai Hind”
f.write(x)

f.seek(0)       # Here seek() will move the file pointer(handle) at the beginning of the file.
print(f.read())
f.close()
```

seek() function: – The seek() function changes the position of the file-pointer by placing the file-pointer at the specified position in the open file.

Syntax: **<file_object>.seek(offset, mode)**

Offset will be 0 or 1 or 2

0 for beginning of the file (to move file pointer w.r.t. beginning of file) it is default mode.

1 for current position of file pointer (to move file pointer w.r.t current position of it.)

2 for end of file (to move file-pointer w.e.t. end of file)

Example:

```
f=open("demo_seek.txt","r")
print(f.read())          # after reading all the bytes file pointer reaches to the end of the file.

f.seek(6)                # Now the file pointer will move to the 6th Byte from beginning.
print(f.read())          # It will print the remaining number of bytes after 6th Byte.
```

tell() function: – This function returns the current position of file pointer in the file.

Syntax: <file_object>.tell()

Example:

```
f=open("d:\\pooja\\demo_seek.txt","r")
print(f.read(5))         # This will read 5 bytes from the beginning
print(f.tell())          # This will show 5 as file pointer is at 5th character from beginning
```

BINARY FILES:

A Binary file stores the information in the form of a stream of bytes. A binary file stores the data in the same way as stored in the memory. In Binary file there is no delimiter for a line. The file contents returned by a binary file is raw i.e. with no translation, thus Binary files are faster than text files.

Python objects (list, dictionary etc) have a specific structure which must be maintained while storing or accessing them. Python provides a special module called **pickle module** for this.

PICKLING refers to the process of converting the structure(list/dictionary) to a byte of stream before writing it to a file. The process to converts any kind of python objects (list, dict etc.) into byte streams (0s and 1s).

UNPICKLING is used to convert the byte stream back to the original structure while reading the contents of the file.

pickle Module: -

Before reading or writing to a file, we have to import the pickle module.

```
import  pickle
```

pickle module has two main methods: **dump()** and **load()**

pickle.dump() – This method is used to write the object in the file which is opened in 'wb' or 'ab' i.e. write binary or append binary access mode respectively.

Syntax : **pickle.dump(<structure>,<FileObject>)**

Here, Structure can be list or dictionary.
FileObject is the file handle of file in which we have to write.

 # Simple program to write a list data into a binary file

```
import pickle
fo = open("binary_file1.dat","wb")
Laptop = ["Dell","HP","ACER"]
pickle.dump(Laptop,fo)
fo.close()
```

pickle.load() – This method is used to read data from a file and return back into the structure (list/dictionary).

Syntax : ***<structure> = pickle.load(<FileObject>)***

Structure can be any sequence in Python such as list, dictionary etc. FileObject is the file handle of file in which we have to write.

 # Program to read data from a binary file

```
fbin = open("binary_file1.dat","rb")
x=pickle.load(fbin)
print(x)
fbin.close()
```

 # Simple program to write a dictionary data into a binary file

```
import pickle
f=open("my_bin1.bin","wb")
D1={3:'Maruti',2:'Honda',4:'Hundai',1:'BMW'}
pickle.dump(D1,f)
f.close()



f1=open("my_bin1.bin","rb")
D2=pickle.load(f1)
print(D2)
f.close()
```

 # Write a User defined function bdict() to store customer data into a binary file customer.dat using a dictionary and print them on screen after reading them. The customer data contains customer_ID(c1,c2,c3) as key, and name, city as values.

```
import pickle
def bdict():
   f = open("customer.dat","wb")
   d = {'C1':['Siman Raheja','Haryana'],
       'C2':['Praharsh Kumar','Pune'],
       'C3':['Vinita Minj','Indore']}
   pickle.dump(d,f)
   f.close()

   f = open("customer.dat","rb")
```

```
    d = pickle.load(f)
    print(d)
    f.close()
```

 # Sample program to insert any number of records (as per user's choice) of employee (employee number, name, salary and allowance) and then display all the records.

```
import pickle
bfile=open("empfile.dat","ab")
recno=1
while True:
    print("RECORD No.", recno)
    eno=int(input("\tEmployee number : "))
    ename=input("\tEmployee Name : ")
    ebasic=int(input("\tBasic Salary : "))
    allow=int(input("\tAllowances : "))
    totsal=ebasic+allow
    print("\tTOTAL SALARY : ", totsal)

    edata=[eno,ename,ebasic,allow,totsal]
    pickle.dump(edata,bfile)

    ans=input("Do you wish to enter more records (y/n)? ")
    recno=recno+1
    if ans.lower()=='n':
        print("Record entry OVER ")
        break
bfile.close()
```

```
rbfile=open("empfile.dat","rb")
readrec=1
try:
   while True:
      edata=pickle.load(rbfile)
      print("Record Number : ",readrec)
      print(edata)
      readrec=readrec+1
except EOFError:
   print('Sorry No more records to show now.')
   pass
rbfile.close()
```

 # Write a program that have a binary file “Book.dat”. The file has structure [BookNo, Book_Name, Author, Price]. Now do as directed: -

1) Write a user defined function CreateFile() to input data for a record and add to Book.dat.
2) Write the definition of show_all_books() UDF to display the details of all the books.
3) Write a User Defined function CountRec(Author) in Python which accepts the Author name as parameter, display the details of the book of the same author also return the number of books of the given Author are stored in the binary file “Book.dat"

```
import pickle

def createfile():
   fobj=open("Book.dat","ab")

   BookNo=int(input("Enter Book Number : "))
   Book_name=input("Enter book Name :")
   Author = input("Enter Author name: ")
   Price = int(input("Price of book : "))
```

```
    rec=[BookNo, Book_name ,Author, Price]
    pickle.dump(rec, fobj)
    print("Record saved")
    fobj.close()

def show_all_books():
    fobj=open("Book.dat","rb")
    L1=[]

    try:
        while True:
            L1=pickle.load(fobj)
            print(L1)

    except EOFError:
            print('All Record displayed')
            pass
    fobj.close()

def countrec(Author):
    fobj=open("Book.dat", "rb")
    cnt = 0
    print("Book No Book Name Author Price")

    try:
        while True:
            r=pickle.load(fobj)
            if Author==r[2]:
                cnt = cnt + 1
```

```
            print(r[0],"\t",r[1],"\t",r[2],'\t',r[3])
    except:
        print()

    fobj.close()
    return cnt
```

 # Write a program that uses a binary file "STUDENT.DAT" has structure [roll_number, Name, Percentage]. Write a User defined function countrec() that would read contents of the file

"STUDENT.DAT" and display the details of those students whose percentage is above 75%.

```
import pickle

def createfile():
    fobj=open("student.dat","ab")

    rno=int(input("Enter Roll No : "))
    nm=input("Enter Name :")
    p = int(input("Enter percentage: "))

    rec=[rno, nm , p]
    pickle.dump(rec, fobj)
    print("Record saved")
    fobj.close()

def countrec():
   fobj=open("student.dat","rb")
   num = 0
   try:
     while True:
```

```
        rec=pickle.load(fobj)



        if rec[2]>375:
            num = num + 1
            print(rec[0],rec[1],rec[2])
    except:
      fobj.close()
    return num
```

createfile()

countrec()

CSV FILES: -

CSV stands for Comma Separated Values. It is a type of plain text file that uses specific structure to arrange tabular data i.e. data stored in rows and columns such as a spreadsheet or database.

CSV is like a text file, It is in human readable format and extensively used to store tabular data, in a spreadsheet or database.

Each line of the csv file is a data record. Each record consists of one or more fields, separated by commas. The separator character of CSV files is called a delimiter.

Default delimiter is (,). Other delimiters are tab(\t), colon (:), pipe(|), semicolon (;) characters.

READING FROM A CSV FILE

To read data from csv files, reader() method of csv module is used.
csv.reader() returns a reader object.

STEPS TO READ

1) import csv module

   import csv

2) Open csv file in read mode.
   f = open("csv_demo.csv","r")

3) Create the reader object.
   demo_reader = csv.reader(f)

4) Fetch data through for loop, row by row.
for x in demo_reader:
   print(x)

5) Close the file

   f.close()

 # Program to read from a csv file import csv

```
f = open("emp.csv","r")
emp_reader=csv.reader(f)
for row in emp_reader:
        print(row[0],row[1],row[2])      # print(row)  : As a list
f.close()
```

<u>WRITING IN TO CSV FILES:</u>

To write data into csv files, **writer()** function of csv module is used.

csv.writer(): This function returns a writer object which writes data into writer object.

Significance of writer object

The csv.writer() returns a writer object that converts the data into a delimited string.The string can be later converted into csv files using the writerow() or writerows() method.

Syntax:

<writer_object>.writerow() :

Writes one row of data in to the writer object.

<writer_object>.writerows()

Writes multiple rows into the writer object.

 # Program to write data into a CSV File and to read data stored in csv file

```
import csv
f=open("mycsv.csv","w",newline='')
w=csv.writer(f)
lst=["RNO","NAME","MARKS"]
w.writerow(lst)

n=int(input('Enter how many students record you want to add'))
for x in range(n):
   r=int(input('Enter rno'))
   n=input('Enter name')
   m=int(input('Enter marks'))
   lst2=[r,n,m]
   w.writerow(lst2)
f.close()


f=open("mycsv.csv","r")
rec=csv.reader(f)
for i in rec:
   print(i)
f.close()
```

 # Program to write Employee Name, EmpID and Dept for some employees in a csv file then display records of all the employees.

```
import csv

f=open("emp.csv","w",newline='')
```

```
emp_writer = csv.writer(f)

emp_writer.writerow(["EmpName","EmpID","Dept"])

emp_rec = []

while True:
   print("Enter Employee details: ")
   empname = input("EmpName : ")
   eid = int(input("EmpID : "))
   dept = input("Department : ")

   emp_rec.append([empname,eid,dept])

   ch = input("Do you want to continue ?? (Y?N)")

   if ch == "N" or ch =="n":
      break

emp_writer.writerows(emp_rec)

f.close()


f=open("emp.csv","r")

rec=csv.reader(f)

for i in rec:
   print(i)

f.close()
```

Question based on CSV file Handling: -

Madhwan, is doing internship in “SQUARE Solutions Pvt. Ltd.”. He wrote the following python code to store student’s data in csv file (Student.csv) handling. Unfortunately, he forgot some steps of the python code. Please help him to create a CSV File 'Student.csv' by completing the code.

CSV File

1,SAKSHAM,XII,A
2,ARNAV,XI,A
3,SHREEVALI,XII,A
4,BHOOMI,XI,A
5,SWARIT,XII,A

The Incomplete Code written by Madhwan is as follows: -

```
import_____                                  #Statement-1

csvfh = open(_____, _____, newline='')       #Statement-2

stuwriter = csv._____                        #Statement-3

data = []

header = ['ROLL_NO', 'NAME', 'CLASS', 'SECTION']

data.append(header)

for i in range(5):
    roll_no = int(input("Enter Roll Number : "))
    name = input("Enter Name : ")
    Class = input("Enter Class : ")
    section = input("Enter Section : ")
    rec = [_____]                            #Statement-4
    data.append(rec)
    stuwriter. _____ (data)                  #Statement-5

csvfh.close()
```

a) Identify the suitable code for Statement-1.

a) csv file
b) CSV

c) csv
d) Csv

Correct Answer : c) csv

b) Identify the correct parameters for Statement-2?

a) "School.csv","w"
b) "Student.csv","w"
c) "Student.csv","r"
d) "School.csv","r"

Correct Answer: b) "Student.csv","w"

c) Choose the function name (with argument) to complete Statement-3

a) reader(csvfh)
b) reader(MyFile)
c) writer(csvfh)
d) writer(MyFile)

Correct Answer : c) writer(csvfh)

d) Identify the suitable code for Statement-4.

a) 'ROLL_NO', 'NAME', 'CLASS', 'SECTION'
b) ROLL_NO, NAME, CLASS, SECTION
c) 'roll_no','name','Class','section'
d) roll_no,name,Class,section

Correct Answer : d) roll_no,name,Class,section

e) Choose the function name that should be used for Statement-5 to create the desired CSV File.

a) dump()
b) load()
c) writerows()
d) writerow()

Correct Answer : c) writerows()

Data Structures: Stack using List

Data Structure

In Data Structure we are collecting and organizing data in such a way that wecan perform operations on these data in an effective way.

Stack

A stack is a data structure whose elements are accessed according to the Last- In First-Out (LIFO) mechanism. This is because in a stack, insertion and deletion of elements can only take place at one end, which is called top of the stack.

Consider the following examples of stacks:

1. A pile of books
2. A stack of coins
3. Ten glass plates placed one above another.

Fig.1 A stack of coins (ref: google.com)

In the above picture coins are kept one above the other and if any additional coinI need to be added, it can be added only on the top.

Similarly, If we want to remove any coin from the stack, the coin on the top of the stack has to be removed first. That means, the coin that was kept last (i.e. at the top) in the stack has to be taken out first.

The two operations performed on the stack are:

- **Push operation:** It means inserting element at the top of the stack. Thiscan be done with the help of append() method of the list as: st.append(element) where 'st' is a list.
- **Pop operation:** It means removing the topmost element from the stack. This can be performed using pop() method of the list as: st.pop() where 'st'is a list. This method returns the removed element that can be displayed.

Applications of Stack

- Recursion
- Postfix notations(Evaluation of expressions)
- Tower of Hanoi

 # Program to implement stack using list

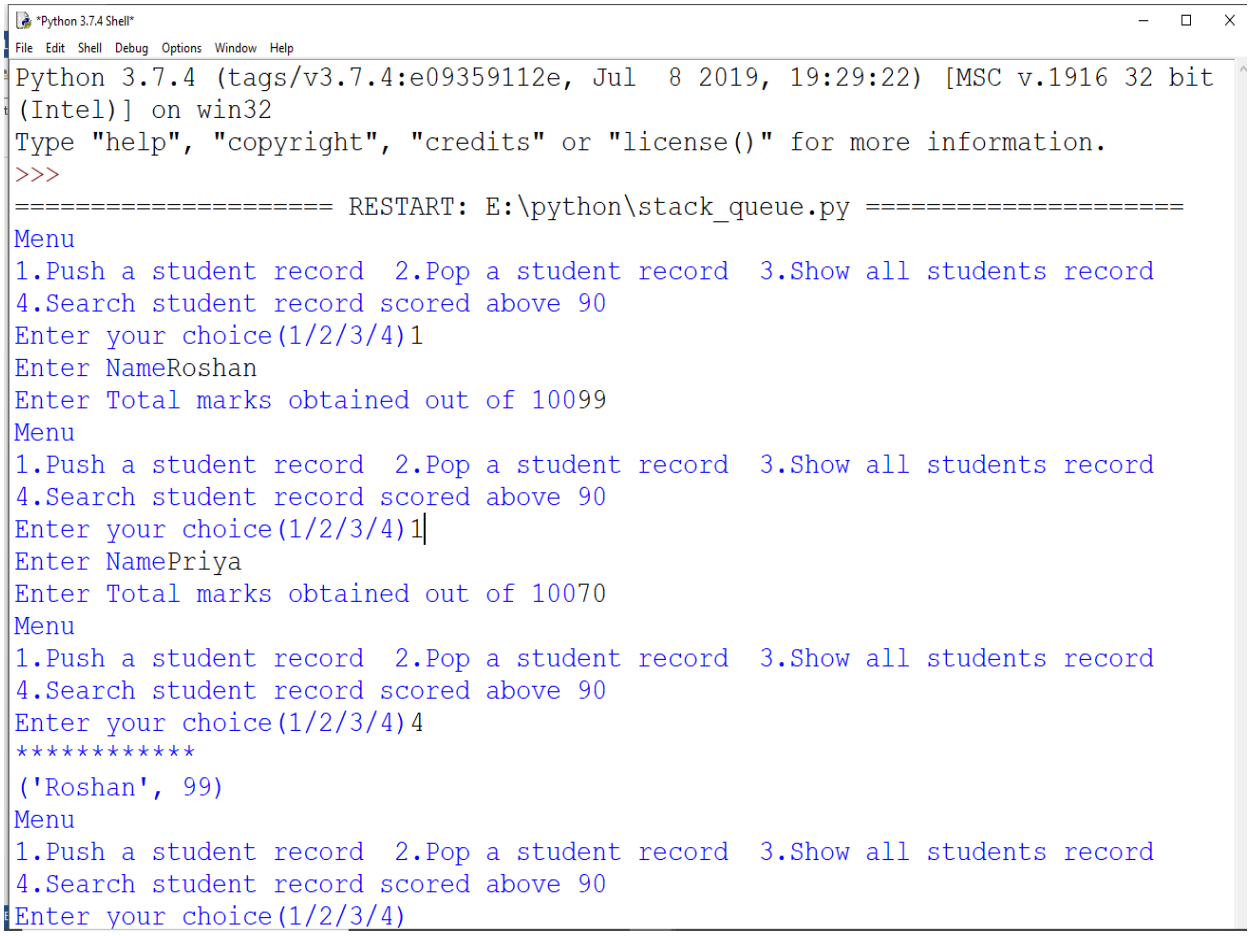
```
st=[]                        #to create an empty list
def stkpush():
   n=int(input("Enter a No. : "))
   st.append(n)

def stkpop():
   if len(st) ==0:
      print("Underflow")
   else:
      print(st.pop()," removed")

def display():
   if st==[ ]:
      print("Underflow")
   else:
      print("stack is: ")
      L=len(st)-1
      for i in range(L,-1,-1): print(st[i])

char=True
while(char):
   print("1.Push")
   print("2.Pop")
   print("3.display")
   ch=int(input("Enter choice: "))
   if ch==1:
      stkpush()
   elif ch==2:
      stkpop()
   elif ch==3:
      display()
   else:
      char=False
```

Output: -

 # A Menu Driven Program to store Name and marks out of 100 for some students in a stack and implementation of stack operations.

```
stk=[]
ui='y'

while(ui=='y'):
   print('Menu')
   print('1.Push a student record’)
   print(‘2.Pop a student record’)
   print(‘3.Show all students record')
   print('4.Search student record scored above 90')

   ans=int(input('Enter your choice(1/2/3/0)'))

   if(ans==1):
      n=input('Enter Name')
      m=int(input('Enter Total marks obtained out of 100'))
      stk.append((n,m))
```

```
if(ans==2):
    if(stk==[]):
        print('Stack is empty')
    else:
        y=stk.pop()
        print(y,' is removed from stack')

if (ans==3):
    s=len(stk)
    for i in range(s-1,-1,-1):
        print('============')
        print(stk[i])

if(ans==4):
    s=len(stk)
    for i in range(s-1,-1,-1):
        if (stk[i][1]>=90):
            print('************')
            print(stk[i])
```



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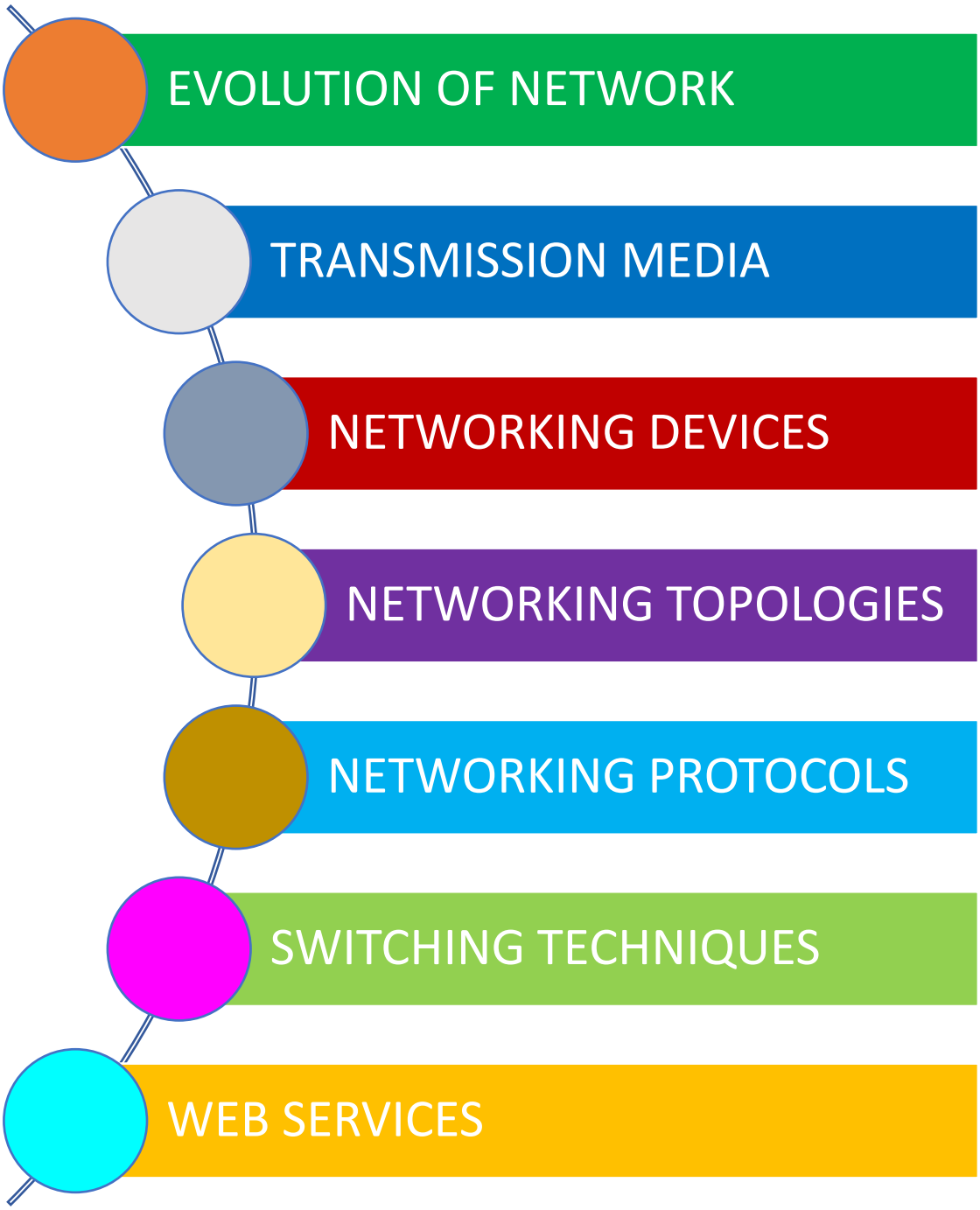
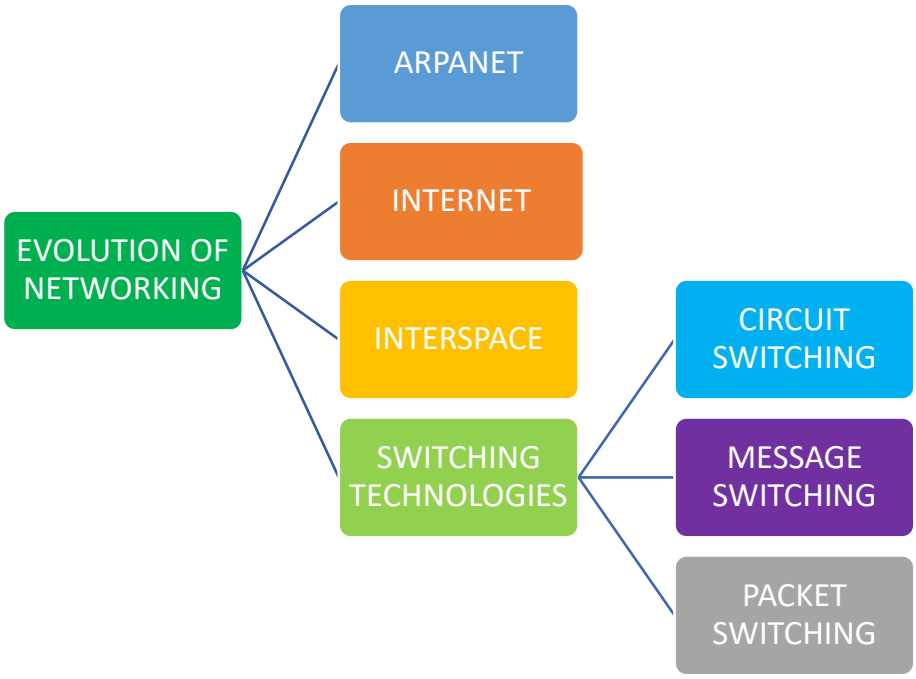
UNIT-II-COMPUTER NETWORK

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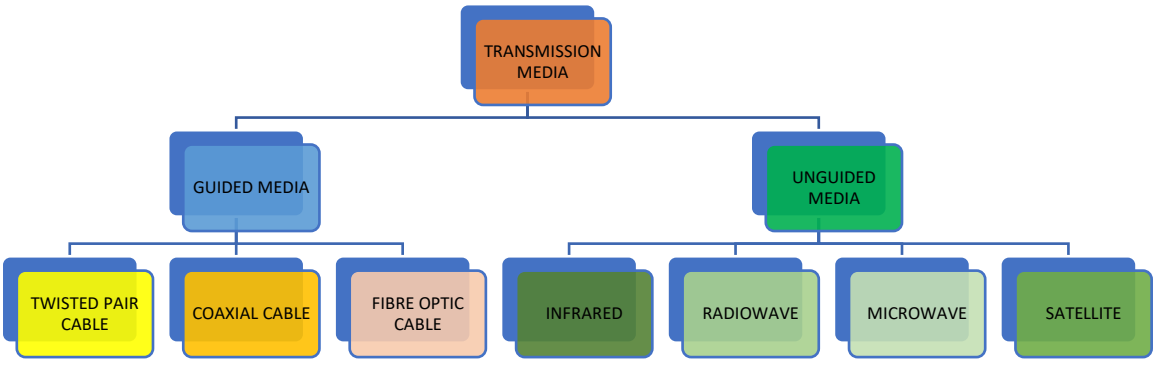
ARPANET
INTERNET
INTERSPACE
SWITCHING TECHNOLOGIES
CIRCUIT SWITCHING
MESSAGE SWITCHING
PACKET SWITCHING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MICROWAVE
SATELLITE


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ROUTER
WI-FI CARD
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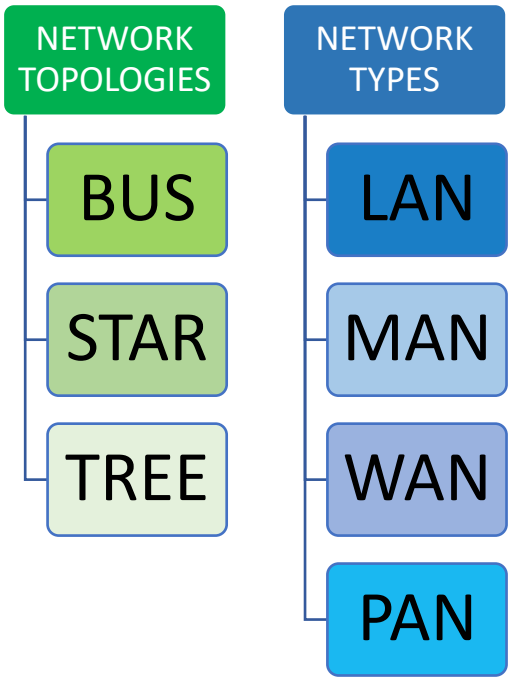
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STAR
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NETWORK TYPES
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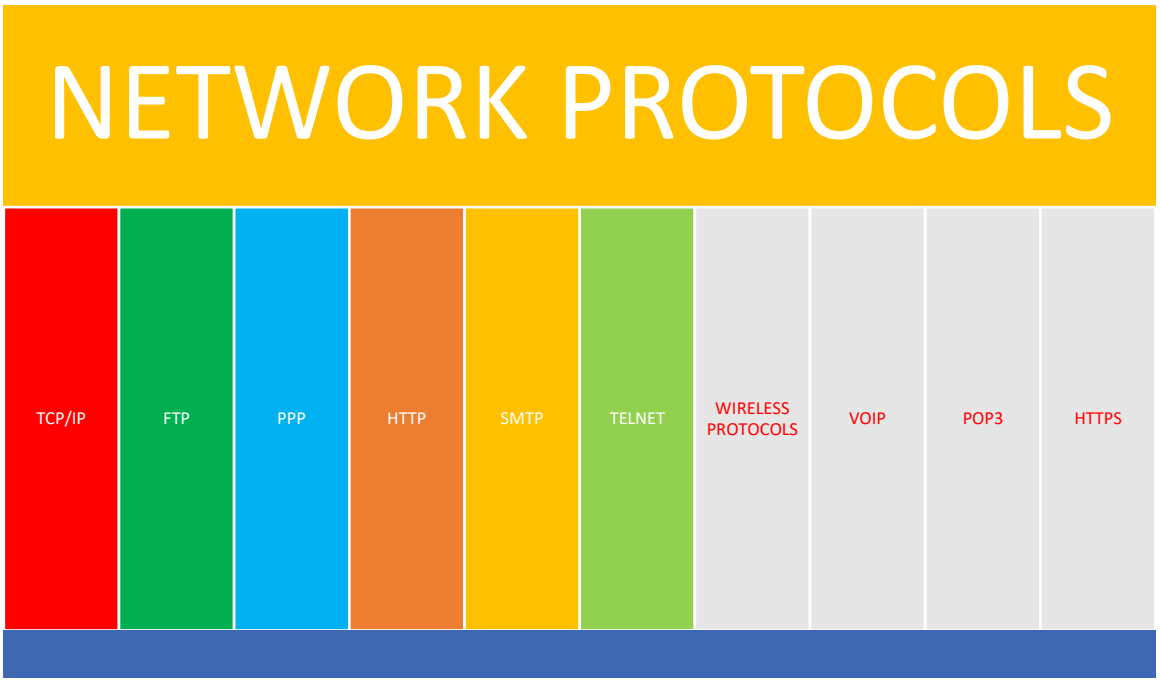
WAN
PAN



WEB SERVICES

COMPUTER NETWORK

Short Answer Questions (1 Mark/2 Marks)

Q: Abbreviation (based 1 or 2 marks)

1	NIU	Network Interface Unit
2	MAC	Media Access Control
3	TCP/IP	Transmission Control Protocol/Internet Protocol
4	PAN	Personal Area Network
5	LAN	Local Area Network
6	MAN	Metropolitan Area Network
7	WAN	Wide Area Network
8	UTP	Unshielded Twisted Pair
9	STP	Shielded Twisted Pair
10	Mbps	Mega bits per sec
11	EMI	Electro Magnetic Interference
12	RJ	Registered Jack
13	Wi-Fi	Wireless Fidelity
14	VPN	Virtual Private Network
15	IAAS	Infrastructure As A Service
16	PAAS	Platform As A Service
17	SAAS	Software As A Service
18	DAAS	Desktop As A Service
19	IOT	Internet Of Things
20	NIC	Network Interface Card
21	CSMA/CD	Carrier Sense Multiple Access/Collision Detection
22	CSMA/CA	Carrier Sense Multiple Access/Collision Avoidance
23	DNS	Domain Name System
24	DHCP	Dynamic Host Configuration Protocol
25	ISP	Internet Service Provider
26	URL	Uniform Resource Locator
27	HTTP	Hyper Text Transfer Protocol
28	FTP	File Transfer Protocol
29	FDMA	Frequency Division Multiple Access
30	TDMA	Time division Multiple Access
31	CDMA	Code Division Multiple Access

32	SIM	Subscriber Identity Module
33	EDGE	Enhanced Data rates for GSM Evolution
34	UMTS	Universal Mobile Telecommunications System
35	LTE	Long Term Evolution
36	GPRS	General Packet Radio Service
37	ICMP	Internet Control Message Protocol
38	OSI	Open Systems Interconnection
39	SMTP	Simple Mail Transfer Protocol
40	VoIP	Voice Over Internet Protocol
41	SIP	Session Initiation Protocol
42	QoS	Quality of Service
43	POP	Post Office Protocol
44	IMAP	Internet Mail Access Protocol
45	SCP	Secure Copy Protocol
46	SSH	Secure Shell
47	IEEE	Institute of Electrical & Electronic Engineering
48	NFC	Near-Field Communication
49	NFS	Network File System
50	NTP	Network Time Protocol
51	SLIP	Serial Line Internet Protocol
52	PPP	Point to Point Protocol
53	UDP	User Datagram Protocol
54	SNMP	Simple Network Management Protocol

Q. What are the components required for networking?

Ans Components of a network are:

Sender
Receiver
Transmission media
NIC
Connecting components: Switch, Hub, Router, Modem, Repeater, bridges, gateway

Q. Define internet?

Ans Internet is a network of networks.

Q. Write two advantage and disadvantage of networks.

Ans Advantages:

1. Resource sharing
2. Enhanced communication
3. Reliability and flexibility

Disadvantages:

1. Network setup cost
2. Malware infection
3. Security of networks

Q. What is ARPAnet?

Ans ARPAnet (Advanced Research Project Agency Network is a project sponsored by U. S. Department of Defense.

Q. What is communication channel?

Ans Communication channel mean the connecting cables that link various workstations. Following are three basic types of communication channels available:

a) Twisted-Pair Cables
b) Coaxial Cables
c) Fiber-optic Cables

Q. Define baud, bps and Bps. How are these interlinked?

Ans Baud is a unit of measurement for the information carrying capacity of a communication channel.
bps- bits per second. It refers to a thousand bits transmitted per second.
Bps- Bytes per second. It refers to a thousand bytes transmitted per second. All these terms are measurement

Q. What do you understand by Interspace?

Ans Interspace is a client/server software program that allows multiple users to communicate online with real-time audio, video and text chat I dynamic 3D environments.

Q. Define Client and server.
Ans Server- It is a special computer that provides services/data to other computers/devices on a network
Client- It is a computer on a network that demands for service from server

Q. Name any two switching circuits .

Ans The two switching circuits are i)Circuit Switching ii)Message Switching

Q.Give one example of each – Guided media and Unguided media.

Ans: Guided – Twisted pair, Coaxial Cable, Optical Fiber (any one)
Unguided – Radio waves, Satellite, Micro Waves (any one)

Q. Name the protocol that is used to transfer file from one computer to another.
Ans:FTP

Q.Name the transmission media best suitable for connecting to desert areas.
Ans: Microwave

Q.Rearrange the following terms in increasing order of speedy medium of data transfer:
Telephone line, Fiber Optics, Coaxial Cable, Twisted Paired Cable.
Ans: Telephone line, Twisted Pair Cable, Coaxial Cable, Fiber Optics.

Q.Name the transmission media suitable to establish PAN.
Ans: Bluetooth, infrared

Q. Name the protocol that is used to upload and download files on internet.

Ans: FTP or HTTP

Q..Name the protocol that is used to send emails. Ans:-SMTP

Q. Name the protocol that is used to receive emails. Ans:-POP

Q.Name the transmission media best suitable for connecting to hilly areas.
Ans: Microwave / Radio wave.

Q.Name the fastest available transmission media.
Ans: OFC (Optical Fiber Cable)

Q.Which type of network (out of LAN, PAN and MAN) is formed, when you connect two mobiles using Bluetooth to transfer a video?

Ans:PAN

Q.Out of SMTP and POP3 which protocol is used to receive emails ?

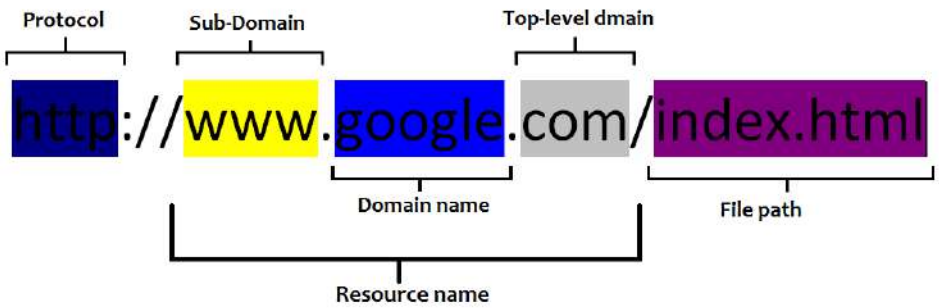
Ans: POP3

Q. Ravi has purchased a new Smart TV and wants to cast a video from his mobile to his new Smart TV. Identify the type of network he is using and explain it.
Ans: Ravi is using PAN-Personal Area Network. It is a private network which is setup by an individual to transfer data among his personal devices of home.

Q.Your friend Rakesh complaints that somebody accessed his mobile device remotely and deleted the important files. Also he claims that the password of his social media accounts were changed. Write a the name of crime?
Ans:The gaining of unauthorized access to data in a system or computer is termed as hacking. It can be classified in two ways: (i) Ethical Hacking (ii)Cracking

Q.. Identify the parts of URL:
http://www.google.com/index.html

Ans:



Q.. What do you mean by Protocol?

Ans: A protocol means the rules that are applicable for a network or we can say that the common set of rules used for communication in network.

Q.What is web hosting?

Ans: Web hosting is the service that makes our website available to be viewed by others on the Internet. A web host provides space on its server, so that other computers around the world can access our website by means of a network or modem.

Q. Which protocol is used to creating a connection with a remote machine?

Ans: Telnet: It is an older internet utility that lets us log on to remote computer system. It also facilitates for terminal emulation purpose.

Q.Explain the purpose of a router.

Ans: A router established connection between two networks and it can handle network with different protocols. Using a routing table, routers make sure that the data packets are travelling through the best possible paths to reach their destination.

Q.What are repeaters?

Ans: A repeater is an electronic device that receives a signal and retransmits it at a higher level and/ or higher power, or onto the other side of an obstruction, so that the signal can cover longer distances

Q. What is the difference between hub and switch? Which is more preferable in a large network of computers and why?
Ans: Hub forwards the message to every node connected and create a huge traffic in the network hence reduces efficiency whereas a Switch (also called intelligent hub) redirects the received information/ packet to the intended node(s).
In a large network a switch is preferred to reduce the unwanted traffic in the network. It makes the network much more efficient.

Q.Differentiate between web server and web browser. Write any two popular web browsers.
Ans: Web Browser : A web browser is a software application for accessing information on the World Wide Web. When a user requests a web page from a particular website, the web browser retrieves the necessary content from a web server and then displays the page on the user‟s device.
Web Server : A web server is a computer that runs websites. The basic objective of the webserver is to store, process and deliver web pages to the users. This intercommunication is done using Hypertext Transfer Protocol (HTTP).
Popular web browsers: Google Chrome, Mozila Firefox, Internet Explorer etc.

Q.Define network interface card

Ans: NIC is a network adapter used to set up a wired network. It acts as an interface between computer and the network. It is a circuit board mounted on the motherboard of a computer. Each NIC has a MAC address, which helps in uniqyuely identifying the computer on the network

Q.Identify the Domain name and URL from the following:

http://www.income.in/home.aboutus.hml

Ans:Domain name – income.in

URL – http://www.income.in/home.aboutus.hml.

Q.Categorize the following under client-side and server-side scripts category:

1. Jave Script
2. ASP
3. VB Script
4. JSP

Ans Client Side Scripts : VB SAcript, Java Script

Server Side Scripts: ASP, JSP

Q. Identify the type of topologies on the basis of the following:

1. Since every node is directly connected to the server, a large amount of cable is needed which increases the installation cost of the network.
2. It has a single common data path connecting all the nodes.

Ans:1. Star Topology

2. Bus Topology

Q.Differentiate between circuit switching and message switching.

Ans :

Circuit Switching	Packet Switching
In-circuit switching has there are 3 phases: i) Connection Establishment. ii) Data Transfer. iii) Connection Released.	In Packet switching directly data transfer takes place.
In-circuit switching, each data unit knows the entire path address which is provided by the source.	In Packet switching, each data unit just knows the final destination address intermediate path is decided by the routers.
In-Circuit switching, data is processed at the source system only	In Packet switching, data is processed at all intermediate nodes including the source system.
The delay between data units in circuit switching is uniform.	The delay between data units in packet switching is not uniform.

Q. What is communication channel? Name the basic types of communication channels available

Ans: Communication channel mean the connecting cables that link various workstations. Following are three basic types of communication channels available:

a) Twisted-Pair Cables
b) Coaxial Cables
c) Fiber-optic Cables.

Q.. Which of the following communication medium requires line of sight communication?

Microwave, radio wave , infrared, Bluetooth

Ans: Microwave, infrared

Q. Arrange the following networks based in descending order of area covered:

WAN, MAN, PAN, LAN

Ans: PAN, WAN, LAN, MAN

Q.. What is routing?

Ans: Routing is the process of selecting paths to move information across networks When a data packet reaches a router, the router selects the best route to the destination network from js routing table and forwards the data packet to the neighbouring router as per the selected best path. This way each router keeps passing the data packet(s) to its neighbouring router on best route the destination and finally the data packet reaches its destination.

Q. . What are the similarities and differences between bus and tree topologies?

Ans: Similarities: In both Bus and Tree topologies transmission can be done in both the directions, and can be received by all other stations. In both cases, there is no need to remove packets from the medium.

Differences: Bus topology is slower as compared to tree topology of network. Tree topology is expensive as compared to Bus Topology

Q.. What are the limitations of star topology?

Ans: Requires more cable length than a linear topology. If the hub, switch, or concentrator fails, nodes attached are disabled. More expensive than linear bus topologies because of the cost of the hubs, etc.

Q.. When do you think, ring topology becomes the best choice for a network?

Ans: Ring topology becomes the best choice for a network when, short amount of cable is required. No wiring closet space requires.

Q.. Write the two advantages and two disadvantages of Bus Topology in network.

Ans. ADVANTAGE: Easy to connect a computer or peripheral to a linear bus. Requires less cable length than a star topology

.

DISADVANTAGE: Slower as compared to tree and star topologies of network. Breakage of wire at any point disturbs the entire

Q.. Define the following:

(i)RJ-45 (ii) modem

(iii) Ethernet card (iv)firewall (v)Switch

Ans: (i) RJ-45: RJ45 is a standard type of connector for network cables and networks. It is an 8-pin connector usually used with Ethernet cables.

(ii) MODEM: Modem stands for Modulation Demodulation. A modem converts the digital data signals into analogue data signals..

(iii)Ethernet card: The computers parts of Ethernet are connected through a special card

called Ethernet card. It contains connections for either coaxial or twisted pair cables.

(iv) firewall: A firewall is a network security device, either hardware or software-based, which monitors all incoming and outgoing traffic and based on a defined set of security rules

(v)Switch: A Switch is a small hardware device that joins multiple computers together within one local area network (LAN).

Q.. Differentiate between

(a) hub and switch.

Ans: Hubs are basic network devices that do not perform packet filtering or addressing function; they send the data packets to all the connected devices. Switches, on the other hand, connect several devices in a network. Switches are mostly utilised to transmit data packets between various network devices such as routers and servers.

(b) Bridge and gateway

Ans: Bridge connects two different LAN working on same protocol. While gateway will settle for and transfer the packet across networks employing a completely different protocol.

Q.. Match the protocols with funtions :

Protocol	Function
SMTP	Transfer of files over internet
FTP	retrieve mails from recipient's server
POP	Request response protocol between server and client
HTTP	Transfer mail from one user to other user

Answer: 1.d, 2. a, 3.b,4.c

Q. Define web browser and web server.

Ans: Web Browser: A Web Browser is software which used for displaying the content on web page(s). It is used by client to view web sites.

Example of Web browser – Google Chrome, Fire Fox, Internet Explorer, Safari, Opera, etc.

Web Server: A Web Server is software which fulfills the request(s) done by web browser. Web server have different ports to handle different request from web browser like generally FTP request is handle at Port 110 and HTTP request is handle at Port 80. Example of Web server are – Apache, IIS

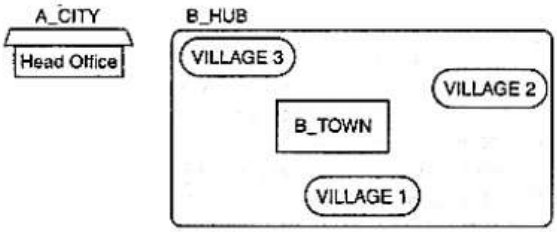
Long Answer Type Questions (5 marks)

Q: Uplifting Skills Hub India is a knowledge and skill community which has an aim to

uplift the standard of knowledge and skills in society. It is planning to set up its

training centres in multiple towns and villages pan India with its head offices in the nearest cities. They have created a model of their network with a city, a town, and 3 villages as follows.

As a network consultant, you have to suggest the best network related solutions for their issues/ problems raised in (i) to (iv) keeping in mind the distance between various locations and given parameters.



The shortest distance between various location:

VILLAGE 1 to B_TOWN	2 KM
VILLAGE 2 to B_TOWN	1.0 KM
VILLAGE 3 to B_TOWN	1.5 KM
VILLAGE 1 to VILLAGE 2	3.5 KM
VILLAGE 1 to VILLAGE 3	4.5 KM
VILLAGE 2 to VILLAGE 3	2.5 KM
A_CITY Head Office to B_HUB	25 KM

The number of Computers installed at various locations is as follows:

B_TOWN	120
VILLAGE 1	15
VILLAGE 2	10
VILLAGE 3	15
A_CITY Head OFFICE	6

Note:

In Villages, there are community centers, in which one room has been given as a

training center for this organization to install computers. The organization has got financial support from the government and top IT companies.

i. Suggest the most appropriate location of the SERVER in the B_HUB (out of the 4 locations), to get the best and effective connectivity. Justify your answer.

ii. Suggest the best-wired medium and draw the cable layout (location to location) to efficiently connect various locations within the B_HUB.

iii. Which hardware device will you suggest to connect all the computers within each location of B_HUB?

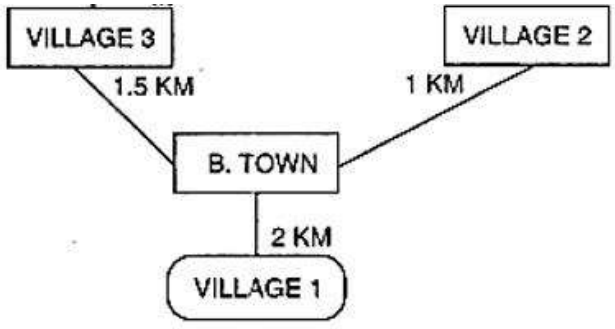
iv. Which service/protocol will be most helpful to conduct live interactions of Experts from Head Office and people at all locations of B_HUB?

v. What kind of network will be formed between city head office and town?

Ans:

i. B-TOWN can house the server as it has the maximum no. of computers.

ii. The optical fiber cable is the best for this star topology.

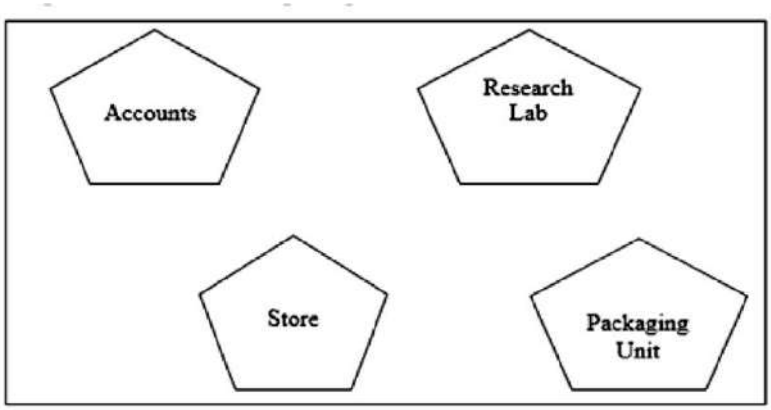


iii. Switch device - connecting all the computers within each location of B_HUB

iv. VoIP- Voice Over Internet Protocol

v. MAN

Q: Rehaana Medicos Centre has set up its new centre in Dubai. It has four buildings as shown in the diagram given below:



Distances between various buildings are as follows:

Accounts to Research Lab	55 m
Accounts to Store	150 m
Store to Packaging Unit	160 m
Packaging Unit to Research Lab	60 m
Accounts to Packaging Unit	125 m
Store to Research Lab	80 m

No of Computers

Accounts	25
Research Lab	100
Store	15
Packaging Unit	60

As a network expert, provide the best possible answer for the following queries:

i) Suggest a cable layout of connections between the buildings.

ii) Suggest the most suitable place (i.e. buildings) to house the server of this organization.

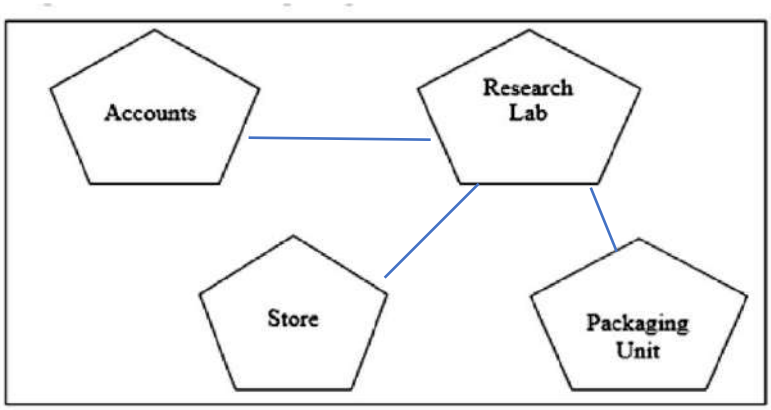
iii) Suggest the placement of the Repeater device with justification.

iv) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.

(v) Suggest the placement of the Hub/ Switch with justification.

Ans:

(i)



(ii) Research Lab

(iii) With respect to above topology repeater is not needed, as none of the distance is above 100m

(iv) Firewall

(v) Switch is better than hub being unicast, secure and fast device. It is needed in all buildings

Q: PVS Computers decided to open a new office at Ernakulum, the office consist of Five Buildings and each contains number of computers. The details are shown below.

building 1

building 2

building 3

building 4

building 5

Building 1 and 2	20 Meters
Building 2 and 3	50 Meters
Building 1 and 5	65 Meters
Building 2 and 5	50 Meters

1	40
2	45
3	
4	
5	60

Computers in each building are networked but buildings are not networked so far. The Company has now decided to connect building also.

(i) Suggest a cable layout for connecting the buildings

(ii) Do you think anywhere Repeaters required in the campus? Why?

(iii) The company wants to link this office to their head office at Delhi

(a) Which type of transmission medium is appropriate for such a link?

(b) What type of network would this connection result into?

(iv) Where server is to be installed? Why?

(v) Suggest the wired Transmission Media used to connect all buildings efficiently.

(i) Any efficient layout with shortest Wire length

(ii) Between 3 and 4 due to larger distance

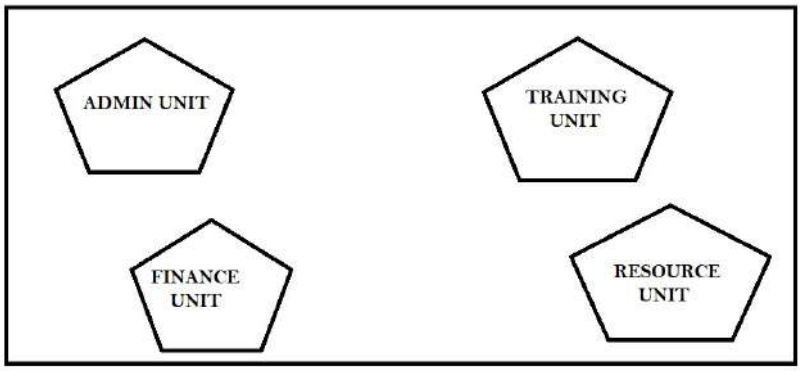
(iii) (a) Wireless (b) WAN

(iv) Building-3 due to maximum no of Computers

(v) Co- axial cable or fibre optics

(1 mark for each correct answer)

Q: "VidyaDaan" an NGO is planning to setup its new campus at Nagpur for its web-based activities. The campus has four (04) UNITS as shown below:



➔ Distances between above UNITs are given here s under:

UNIT-1	UNIT-2	DISTANCE(In mtrs.)
ADMIN	TRAINING	65
ADMIN	RESOURCE	120
ADMIN	FINANCE	100
FINANCE	TRAINING	60
FINANCE	RESOURCE	40
TRAINING	RESOURCE	50

➔ No. of Computers in various UNITs are:

UNIT	NO. OF COMPUTERS
ADMIN	150
FINANCE	25
TRAINING	90
RESOURCE	75

(i) Suggest an ideal topology for connecting the above UNITs.

(ii) Suggest the most suitable place i.e. UNIT to install the server for the above NGO.

(iii) Which network device is used to connect the computers in all UNITs?

(iv) Suggest the placement of Repeater in the UNITs of above network.

(v) NGO is planning to connect its Regional Office at Kota, Rajasthan. Which out of the following wired communication, will you suggest for a very high-speed connectivity?

(a) Twisted Pair cable (b) Ethernet cable (c) Optical Fibre

Ans:

(i) Bus and Star topology both possible

(ii)ADMIN

(iii) Switch

(iv)

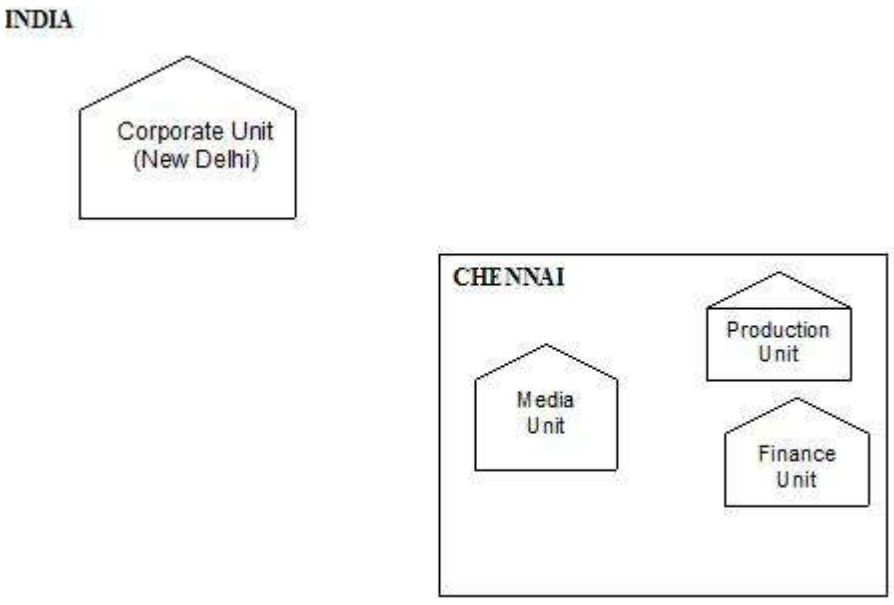
1. ADMIN & RESOURCE

2. ADMIN & FINANCE

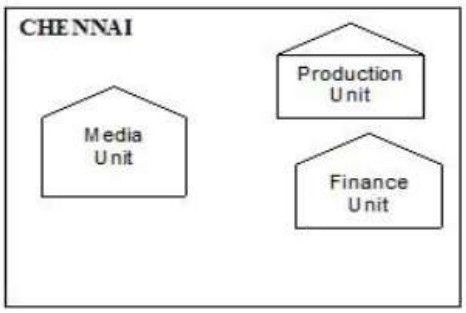
(v) (c) Optical Fiber

Q: "China Middleton Fashion" is planning to expand their network in India, starting with two cities in India to provide infrastructure for distribution of their product. The company has planned to set up their main office units in Chennai at three locations and have named their offices as "Production Unit", "Finance Unit" and "Media Unit". The company has its corporate unit in New Delhi. A rough layout of the same is as follows:

INDIA



Approximate distances between these Units is as follows:



Approximate distances between these Units is as follows:

From	To	Distance
Production	Finance Unit	70 Mtr
Production	Media Unit	15 KM
Production	Corporate Unit	2112 KM
Finance	Media Unit	15 KM

In continuation of the above, the company experts have planned to install the following number of computers in each of their office units:

Production Unit	150
Finance Unit	35
Media Unit	10
Corporate Unit	30

i) Suggest the kind of network required (out of LAN, MAN, WAN) for connecting each of the following office units:

a. Production Unit and Media Unit

b. Production Unit and Finance Unit

ii) Which of the following communication media, will you suggest to be procured by the company for connecting their local offices in Chennai for very effective communication? Ethernet Cable, Optical Fiber, Telephone Cable.

iii) Which of the following devices will you suggest for connecting all the computers within each of their office units?

*Switch/Hub *Modem *Telephone

iv) Suggest a cable layout for connecting the company's local office units in Chennai.

v) Suggest the most suitable place to house the server for the organization with suitable reason.

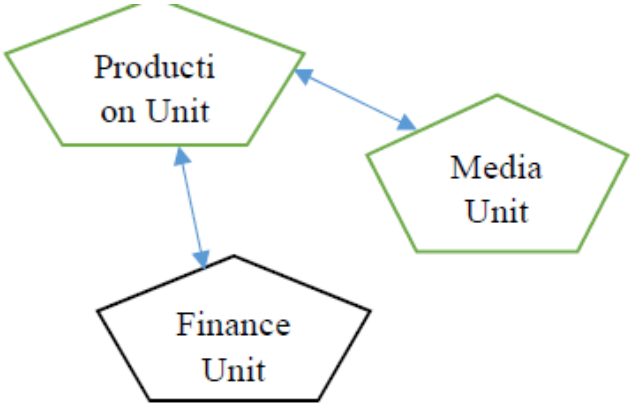
(i)(a) Production Unit and Media Unit :MAN

(b)Production Unit and Finance Unit:LAN

(ii) Switch/Hub

(iii) Optical fiber

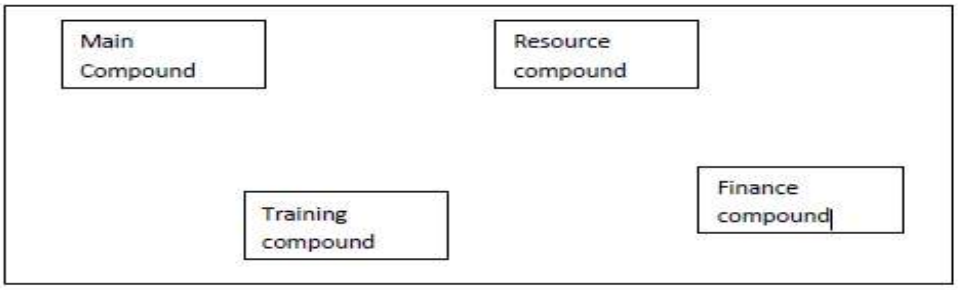
(iv) Star Topology



(v) Server should be placed in the Production Unit as it has maximum number

of computers.

Q 'SmartEdu' is an educational organization is planning to setup its new campus at Cochin for its web based activities. The campus has four compounds as shown in the diagram.



Distance between various compounds

Main to Resource	110m
Main to Training	115m
Main to Finance	235m
Resource to Training	125m
Resource to Finance	155m
Training to Finance	100m

Number of computers in each compounds

Main compound	5
Resource compound	15
Training compound	150
Accounts compound	20

Computers in each building are networked but buildings are not networked. The company has now decided to connect the buildings.

i) Suggest a most suitable cable layout for the above connection

ii) Suggest most suitable topology of the connection between the building.

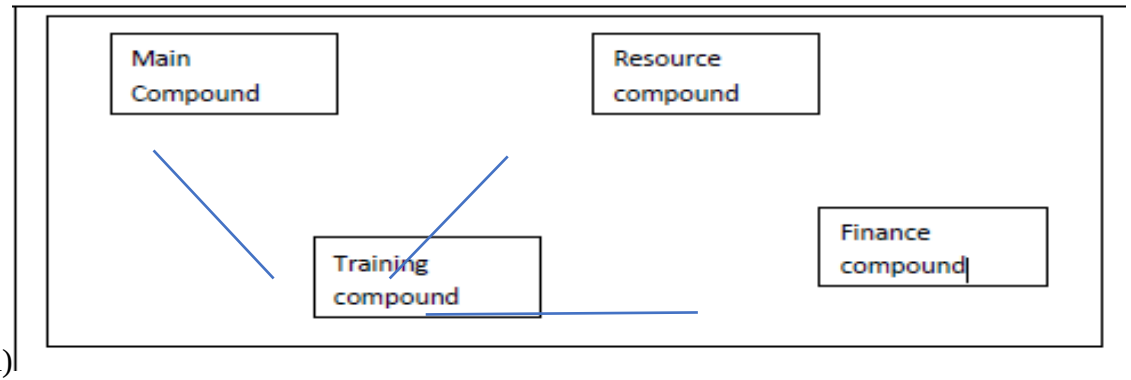
iii) Suggest the most suitable building to place the server by giving suitable reason.

iv) Suggest the placement of the following devices

a) Repeater b) Hub/Switch

v) Organization is planning to link its head office in Chennai. Suggest an efficient medium for efficient data communication.

Ans:- (i)



(ii) Star topology

(iii) Training Compound, as per 80:20 rule maximum computers mean maximum internal traffic

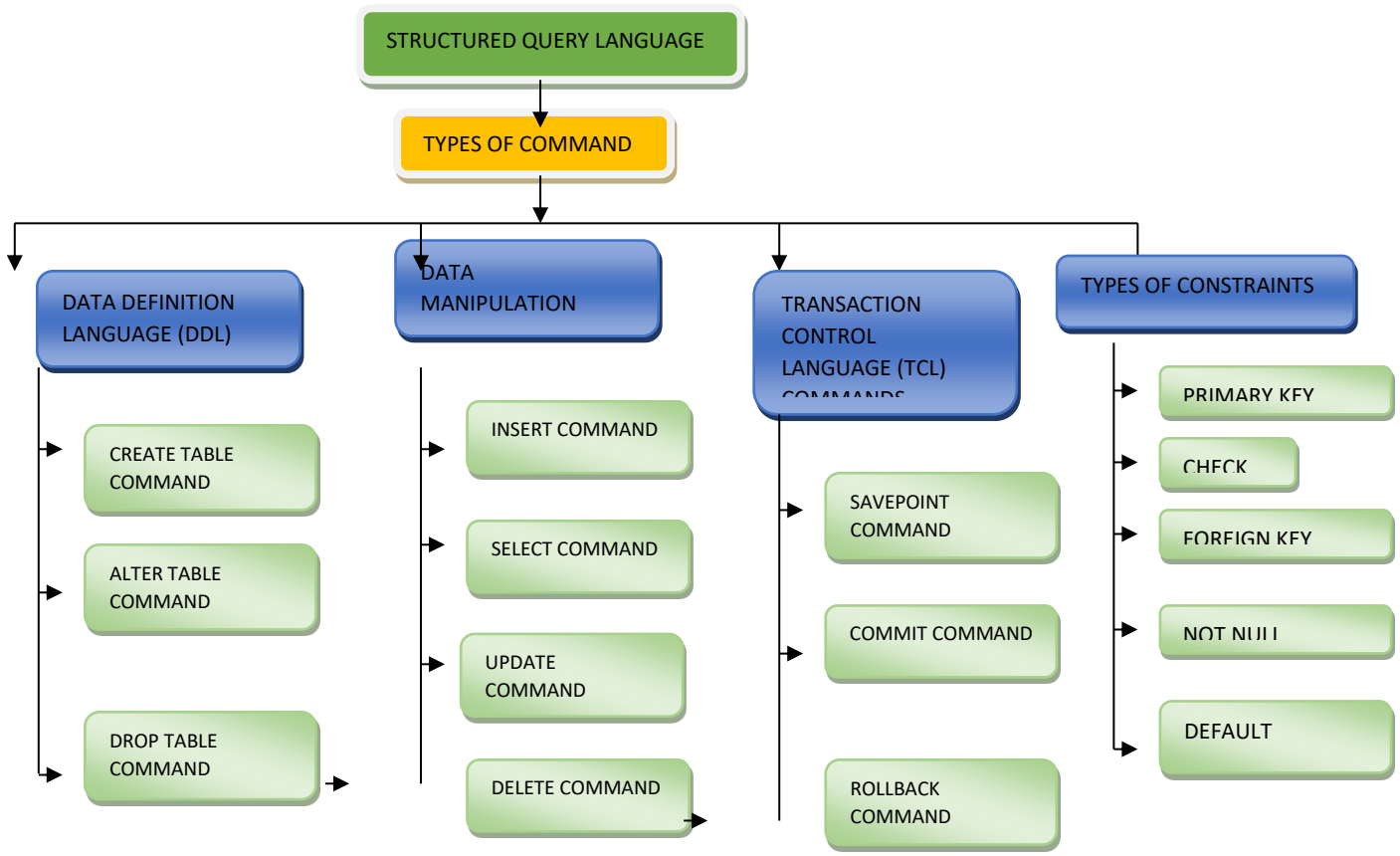
(iv) between Main to Training, resource to Training and Training to Finance as distance is greater than 100m

(v) Optical Fibre

UNIT -III DATABASE MANAGEMENT SYSTEM

RDBMS: Relational Database Management System

Relation	• Table in RDBMS
Attribute	• Columns name of a table
Tuple	• Rows of table
Domain	• Pool of values for Attributes
Degree	• total number of attributes(columns)
cardinality	• total number of tuples(rows)



SQL: Interface with Python

step1 : • import pymysql or mysql.connector

step2 • mydb=mysql.connector.connect(host="____",user="____",passwd="_____")

step3 • mycursor=mydb.cursor()

step4 • mycursor.execute("_____SQL QUERY_____")

Database Management System

DATABASE:

- May be defined as a collection of interrelated data stored together to serve multipleapplication
- It is computer based record keeping system.
- It not only allows to store but also allows us modification of data as per requirements

DBMS:

- A DBMS refers to Database Management System
- It is a software that is responsible for storing, manipulating, maintaining and utilizingdatabase.
- A database along with a DBMS is referred to as a database system.
- There are various DBMS software available in the market like :- Oracle, MS SQL Server, MySQL, Sybase, PostgreSQL, SQLite

Purpose of DBMS:

- Reduced Data redundancy –
- Control Data Inconsistency
- Sharing of data
- Ensure data integrity
- Enforce standard

Relational Database Model:

- In relational database model data is organized into table (i.e. rows and columns).
- These tables are also known as relations.
- A row in a table represent relationship among a set of values.
- A column represent the field/attributes related to relation under which information willbe stored.
- For example if we want to store details of students then : Roll, Name, Class, Section, etc.will be the column/attributes and the collection of all the column information will become a Row/Record

Sample Tables:

EMPLOYEE:

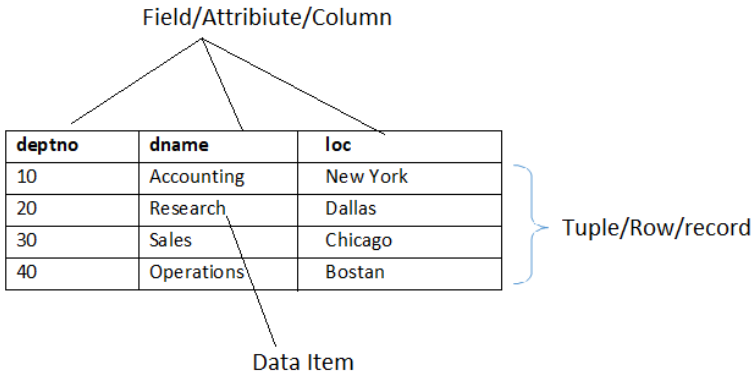
EMPNO	ENAME	GENDER	DEPTNO	SALARY	COMM
1	ANKITA	F	10	20000	1200
2	SUJEET	M	20	24000	
3	VIJAYA	F	10	28000	2000
4	NITIN	M	30	18000	3000
5	VIKRAM	M	30	22000	1700

Dept:

Deptno	dname	Loc
10	Accounting	New York
20	Research	Dallas
30	Sales	Chicago
40	Operations	Bostan

Component of a table:

- Byte: group of 8 bits and is used to store a character.
- Data Item: smallest unit of named data. It represent one type of information and oftenreferred to as a field or column information
- Record : collection of data items which represent a complete unit of information
- Table: collection of all Rows and Columns.



Common RDBMS:

- Oracle, MS SQL Server, MySQL, IBM DB2, IBM Informix, SAP Sybase, Adaptive Server Enterprise, SAP Sybase IQ, Teradata, PostgreSQL, SQLite, etc.
- Out of these MySQL, PostgreSQL and SQLite are Open source implementation.

MySQL

- Runs on virtually all platforms including Linux, Unix and Windows. Popular for web based application and online publishing. It is a part of LAMP (Linux, Apache, MySQL, PHP) stack

SQLite

- Relational DBMS but it is not client-server database engine rather, it is embedded into end program. Arguably the most widely deployed database engine as it is used by severalbrowsers, OS and embedded systems (Mobiles).

PostgreSQL

- General purpose object-relational DBMS.
- It is the most advanced open source database system. It is free and open source i.e.source code is available under PostgreSQL license, a liberal open source license.

Common DBMS Tools for Mobile Devices:

- SQL Anywhere, DB2 Everywhere, IBM Mobile Database, SQL Server Compact, SQL Server Express, Oracle DatabaseLite, SQLite, SQLBase etc.
- Out of these SQLite is public domain open source implementation.

Relational Data Model:-

Data is organized in two-dimensional tables called **relations**. The tables or relations are relatedto each other.

Characteristics of relational database are:-

- Data is arranged into rows and columns,
- Each relation is represented as a table.
- Every row in a table represents a single entity.
- At any given row or column position, there is one and only one value.

Advantages of a relational model are as follows:

- Changes made in the table structure do not affect the data access or other applicationprograms.
- Tabular view also provides easier database design, use, implementation andmanagement.
- Built-in query support .
- Mathematical operations can be successfully carried out using RDBMS.

The **limitations** of relational model are:

- RDBMS incurs hardware and system software overheads.
- The size of database becomes very large.

Various Terms Used in Relational Model: - A **relational database** is a type of database that stores and provides access to data points that are related to one another.

Basic Terminologies related to a Relational Database:-

- **Entity:** An entity is something that exists and an object which can be distinctly identified. *For example*, student entity, employee entity,
- **Attribute:** The term attribute is also used to represent a column.
- **Tuple:** Each row in a table is known as tuple.
- **Cardinality of Relation:** It is the number of records or tuples in the relation.
- **Degree of Relation:** Number of columns or attributes is known as degree of a relation.
- **Domain of Relation:** It defines the kind of data represented by the attribute.
- **Body of the Relation:** It consists of an unordered set of 0 or more tuples.

Concept of Keys

- In relation each record must be unique i.e. no two identical records are allowed in theDatabase.
- A key attribute identifies the record and must have unique values. There are varioustypes of Keys:

Primary key:

- A set of one or more attribute that can identify a record uniquely in the relation is calledPrimary Key.
- There can be only 1 primary key in a table
- Allows only distinct (no duplicate) values and also forces mandatory entry (NOT NULL) i.e. we cannot left it blank.

Candidate Key

- In a table there can be more than one attribute which contains unique values. Thesecolumns are known as candidate key as they are the candidate for primary key.
- Among these database analyst select one as a primary key based on requirement like must contain unique value, compulsory entry and where maximum searching is done etc.

Alternate Key

- In case of multiple candidate keys, one of them will be selected as Primary Key and restof the column will serve as Alternate Key
- A Candidate Key which is not a primary key is an Alternate Key.

Foreign key

- Used to create relationship between two tables.
- It is a non-key attribute whose value is derived from the Primary key of another table.
- Foreign key column will for the value in Primary key of another table, if present thenentry will be allowed otherwise data will be rejected.
- Primary Key column table from where values will be derived is known as Primary Table or Master Table or Parent Table and Foreign key column table will be Foreign Table or Detail Table or Child table.

Example:

EMPLOYEE

EMPNO	ENAME	GENDER	DEPTNO	SALARY	COMM
1	ANKITA	F	10	20000	1200
2	SUJEET	M	20	24000	
3	VIJAYA	F	10	28000	2000
4	NITIN	M	30	18000	3000
5	VIKRAM	M	30	22000	1700

Child Table

DEPARTMENT

DEPTNO	DNAME	LOCATION
10	HR	NEW YORK
20	ACCOUNTS	BRAZIL
30	SALES	CANADA
40	IT	INDIA

Parent Table

From the Above table definition we can observe that the DEPTNO column of EMPLOYEE tableis deriving its value from DEPTNO of table DEPARTMENT. So we can say that the DEPTNO of

EMPLOYEE table is a foreign key whose value is dependent upon the Primary key columnDEPTNO of table DEPARTMENT.

REFERENTIAL INTEGRITY:

- Used to ensure relationship between records in related tables is valid and user don'taccidentally delete or change the related data.
- Referential integrity can be applied when:
- The master table's column is a Primary Key or has a unique index
- The related fields have the same data type
- Both tables must belong to same database.
- When referential integrity is enforced using Foreign Key you must observe the following rules:
- You cannot enter a value in Child Table which is not available in Master Table's Primary key column. However you can enter NULL values in foreign key
- You cannot delete a record from Master Table if matching record exists in related table.
- You cannot modify or change the Primary Key value in Master table if its matching record is present in related table.

Structured Query Language

- It is a language that enables you to create and operate on relational databases
- It is the standard language used by almost all the database s/w vendors.
- Pronounced as SEQUEL
- It is portable i.e. it is compatible with most of the database.
- It is not a case sensitive language.
- It is very easy to learn.

SQL – features

- Allows creating/modifying a database's structure
- Changing security settings for system
- Permitting users for working on databases or tables
- Querying database
- Inserting/modifying/deleting the database contents

Classification of SQL

- DDL (Data Definition Language)
- DML (Data Manipulation Language)
- DCL (Data Control Language)
- TCL (Transaction Control Language)

Data Definition Language:

- It allows to create database objects like creating a table, view or any other databaseobjects.
- The information about created objects are stored in special file called DATA DICTIONARY
- DATA DICTIONARY contains metadata i.e. data about data.
- The commands of DDL are –
    - CREATE – To create a new database object
    - ALTER – To modify existing database object
    - DROP – To permanently remove existing database object.

Data Manipulation Language:

- It allows to perform following operation on data in the table
- Retrieval of information stored in table
- Insertion of new data in table
- Modification of existing data in table
- Deletion of existing data from table
- DML is of 2 type
- Procedural DML (in this we specify what data is needed and how to get it)
- Non-Procedural DML (in this we specifywhat data is needed withoutspecifying how to get it)
- The commands of DML are
    - SELECT – To retrieve data from the table
    - INSERT – To insert new tuple/row in the table

- UPDATE – To update existing tuple/row from the table
- DELETE – To delete existing tuple/row from the table

Exercise:

1. What is Database? What are the advantages of Database System?
2. What is DDL and DML? Give examples of command belonging to each category
3. What is the difference between Primary key and Candidate key
4. What is Primary Key? What are the restriction imposed by Primary Key? How many primary key can be applied on a Table?
5. What is Degree and Cardinality of table?
6. Explain the purpose of DDL and DML commands used in SQL. Also give two examples of each

Introduction of MYSQL

Brief history of MySQL:

- MySQL is freely available open source RDBMS
- It can be downloaded from www.mysql.org
- In MySQL information is stored in Tables.
- Provides features that support secure environment for storing, maintaining and accessingdata.
- It is fast, reliable, scalable alternative to many of the commercial RDBMS today.
- It is developed and supported by MySQL AB, a company based in Sweden.
- This company is now subsidiary of Sun Microsystems. On April 2009 Oracle Corp. acquires Sun Microsystems.
- The chief inventor of MySQL was **Michael Widenius(a.k.a Monty)**.

MySQL has been named after Monty's daughter My. The logo of MySQL is dolphin and name of that dolphin is 'Sakila'.

MYSQL DATABASE SYSTEM:

- MySQL database system refers to the combination of a MySQL server instance and MySQL database.
- It operates using Client/Server architecture in which the server runs on the machinecontaining the database and client connects to server over a network
- MySQL is a multiuser database system, meaning several users can access the databasesimultaneously.

The Server

- Listens for client requests coming in over the network and access the database as per therequirements and provide the requested information to the Client.

The Client

- Are the programs that connect to MySQL server and sends requests to the server and receives the response of Server. Client may be the MySQL prompt or it may be Front-end programming which connect to server programmatically like connecting to MySQL using Python Language or Java or any other language.

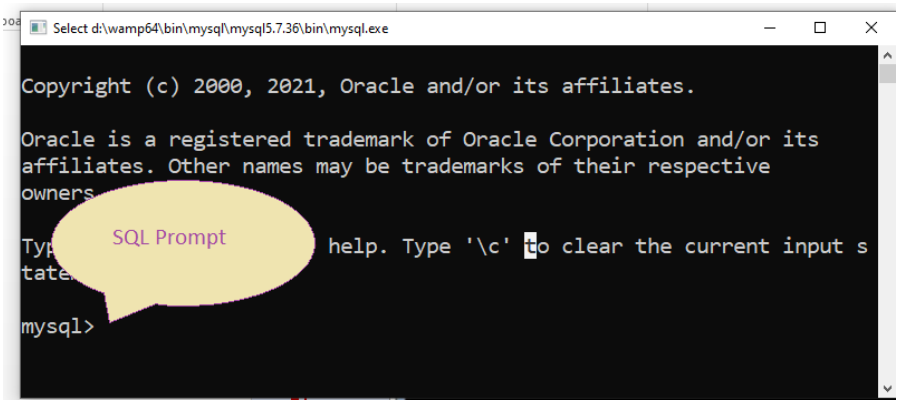
FEATURES OF MYSQL:

- Speed - MySQL runs very fast.
- Ease of Use -Can be managed from command line or GUI
- Cost Is available free of cost. It is Open Source
- Query language Support -Supports SQL
- Portability – Can be run on any platform and supported by various compilers
- Data Types - supports various data types like Numbers, Char etc.
- Security -Offers privileges and password systems that is very flexible and secure.

- Scalability and Limits -Can handle large databases. Some of real life MySQL databases contains millions of records.
- Connectivity-Clients can connect to MySQL using drivers
- Localization -The server can provide error message to client in many language
- Client and Tools -Provides several client and utility programs. Like mysqldump and mysqladmin. GUI tools like MySQL Administration and Query Browser.

STARTING MYSQL:

Click on Start →All Programs →MySQL → MySQL Server→ MySQL →Command LineClient



To exit from MySQL type **exit** or **quit** in front of MySQL prompt.

SQL and MYSQL:

- SQL stands for Structured Query Language.
- It is a language that enables you to create and operate on relational databases.
- MySQL uses SQL in order to access databases.
- It is the standard language used by almost all the database s/w vendors.

MYSQL Elements

- Literals
- Data types
- Nulls
- Comments

Literals

- It means the fixed value or constant value. It may be of character, numeric or date timetype.
- Character and date/time literals are always in single quotation marks whereas numericliterals must be without single quotation marks
- For example – 'Virat', 12, 12.56, '04-20-2018'
- Date and time values are always in the format YYYY-MM-DD HH:MI:SS
- Special character like quotes are always written be preceding it back-slash(\). For example if we want to store value as Tom's Cat then it should be written as Tom\'s Cat

Data Type

- Means the type of value and type of operation we can perform on data. For example onnumeric value we can store numbers and perform all arithmetic operations and so on.
- MySQL support three categories of data types:
- Numeric
- Date and time
- String types

- Numeric Data Types

Data type	**Description**
INT	Numbers without decimal. Store up to 11 digits. -2147483648 to 2147483647
TINYINT	Small integer value between 0 – 255 (4 digits)
SMALLINT	More than TINYINT between -32768 to 32767 (5 digit)
MEDIUMINT	Integer values up to 9 digits
BIGINT	Very large integer value up to 11 digits
FLOAT(M,D)	Real numbers i.e. number with decimal. M specify length of numeric value including decimal place D and decimal symbol. For example if it is given as FLOAT(8,2) then 5 integer value 1 decimal symbol and 2 digit after decimal TOTAL – 8. it can work on 24 digits after decimal.
DOUBLE(M, D)	Real numbers with more precision up to 53 place after decimal.
DECIMAL	It is used to store exact numeric value that preserve exact precision for e.g. money data in accounting system. **DECIMAL(P,D) means P no. of significant digits (1-65), D represent no. of digit after decimal(0-30), for e.g DECIMAL(6,2) means 4 digit before decimal and 2 digit after decimal. Max will be 9999.99**

Date and Time Types

- **DATE**-A date in YYYY-MM-DD format between 1000-01-01 to 9999-12-31.
- **DATETIME**-Combination of date and time. For example to store 4th December 2018 and time is afternoon 3:30 then it should be written as – 2018-12-04 15:30:00
- **TIMESTAMP** - Similar to DATATIME but it is written without hyphen for example the above date time is stored as 20181204153000
- **TIME**-To store time in the format HH:MM:SS
- **YEAR**(M) -To store only year part of data where M may be 2 or 4 i.e. year in 2 digit like 18 or 4 digit like 2018.

String Types

- CHAR(M)
  - Fixed length string between 1 and 255.
  - It always occupy M size, irrespective of actual number of characters entered.
  - Mostly use in the case where the data to be insert is of fixed size like Grade(A,B,C,..) or Employee code as E001, E002, etc
- VARCHAR(M)
  - Variable length string between 1 and 65535 (from MySQL 5.0.3) , earlier it was 255
  - It takes size as per the data entered for example with VARCHAR(20) if the data entered is MOBILE then it will take only 6 byte.
  - It is useful for the data like name, address where the number of character to beenter is not fixed.
- Difference between CHAR & VARCHAR

Char	varchar
Fixed length string	Variable length string
Fast, no memory allocation every time	Slow, as it take size according to data so every time memory allocation is done
It takes more memory	It takes less space

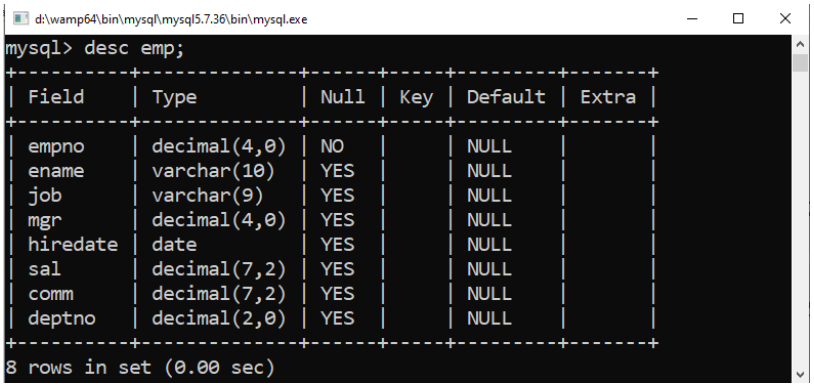
Simple Queries in SQL

- **Show Databases**- This command is used to list all databases on MySql Server
- **Use <databasename>**- This command is used to change/select/open given database

e.g. To open a database named 'test'

>>> **use test**

- **Show tables** – This command will list all the tables from current database. If no database isselected it will generate error.
- **Select database ()** – This command will display the name of current database.
- **Desc <tablename> or Describe <tablename>** - This command will be used to display the structure of the table.



The above figure display the use of **describe** command

- **Create database <databasename>** - This command is use to create a new database.For example – **create database mydb** will new database **mydb**

Above command will generate error, if database already exist. To supress the error following command can be used

create database if not exist mydb

- **Drop database <databasename>** - This command is used to remove existing database. For example – **drop database mydb** will permanently delete **mydb** database.

Above command will generate error, if database already exist. To supress the error following command can be used

drop database if exist mydb

- **Create table <tablename>** - This command / statement is used to create a new table in adatabase. The syntax the is

```
CREATE TABLE table_name ( column1
   datatype[(size)] [constraint] ,column2
   datatype[(Size)] [constraint],
 column3 datatypeI[(size)] [constraints] ,
 ....
);
```

Here size and constraints are optional.

a. g.

```
CREATE TABLE pet (
        name VARCHAR(20),
        owner VARCHAR(20),
 species
VARCHAR(20),sex
CHAR(1),
birth DATE, death DATE);
```

- **Drop table <tablename>** - This command is used to permanently delete the table from database.
  For example, **drop table pet**; will delete **pet** table from database
- **Alter table <tablename>** - This command is used to modify the structure of existing table such as adding new column, removing existing column, rename or changing data type, size and constraints.
  - **Adding new column to exiting tableSyntax** :

    Alter table <tablename>
    Add [column] column_name datatype [(size)];

  - **Removing new existing column from the table**

    Syntax:
    Alter table <tablename>
    drop column <column_name>;

  - **Changing datatype/size of the column**

    Systax:
    alter table <tablename>
    modify column <colname> datatype(size);

  - **Renaming column name**

    Alter table tablename
    Change old_columnname new_column_name datatype (size)

- **Update <tablename>** - This command is used to update data from the tableSyntax:

UPDATE table_name SET column_name=new_value, column2_name=new_value
WHERE condition;
e.g. UPDATE emp set sal=sal+100 where ename =’Scot’

The above query will update salary of Scot by 100.
If where clause is not given, it will update/modify the value of column from each row.

- Inserting into table_name – This command is used to add new row to the

  tableSyntax :

  INSERT INTO table_name VALUES (list of values)

- **Select data from Table using Select statement**

Syntax:

Select clause	select */column_list
from clause	from table(s)
where clause	where condition
group by clause	group by column_name
having clause	having condition
order by clause	order by column_name asc/desc
limit clause;	limit m,n;

- **Selecting/displaying entire data from the table**

Syntax:

SELECT * From tablename;

- **Selecting/displaying data from specific column**

Syntax:

SELECT column1, column2, column3, …. FROM tablename;

- **Giving descripting name for column using column alias**

Syntax:

SELECT */col_name as 'alias1' FROM tablename;

- **Removing duplicate value from the column using distinct clause**

Syntax:

SELECT DISTINCT column_name FROM tablename;

- Display all data from column using all clause

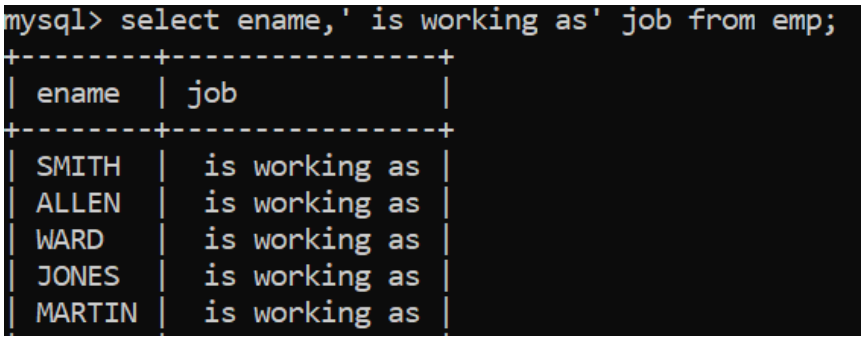
  Syntax:

  SELECT ALL column_name FROM tablename;

- Inserting text in the

  querySyntax:

SELECT 'text' FROM tablename;



```
mysql> select ename,' is working as' job from emp;
+--------+---------------+
| ename  | job           |
+--------+---------------+
| SMITH  |  is working as |
| ALLEN  |  is working as |
| WARD   |  is working as |
| JONES  |  is working as |
| MARTIN |  is working as |
```

Number of row in result depend on total number of rows in the table

- Performing simple calculation in the querySyntax:

Select 2+4;

All operation can be perform such as addition (+), subtraction (-), multiplication (*), division(/) and remainder (%)

Number of row in result depend on total number of rows in the table

- Performing calculation on columnSyntax:

SELECT column1 operator value, column2…. FROM Tablename

- Working with null value

Any operation on NULL will result into NULL, MySql provide ifnull() function to workwith null value. If column contain null value it is replace value given value, otherwise display original value.

Syntax:

ifnull(column, value_to_replace')

```
mysql> select ename, sal, comm, ifnull(comm,'N/A') from emp;
+--------+---------+---------+--------------------+
| ename  | sal     | comm    | ifnull(comm,'N/A') |
+--------+---------+---------+--------------------+
| SMITH  |  800.00 |    NULL | N/A                |
| ALLEN  | 1600.00 |  300.00 | 300.00             |
| WARD   | 1250.00 |  500.00 | 500.00             |
| JONES  | 2975.00 |    NULL | N/A                |
| MARTIN | 1250.00 | 1400.00 | 1400.00            |
| BLAKE  | 2850.00 |    NULL | N/A                |
| CLARK  | 2450.00 |    NULL | N/A                |
| SCOTT  | 3000.00 |    NULL | N/A                |
| KING   | 5000.00 |    NULL | N/A                |
| TURNER | 1500.00 |    0.00 | 0.00               |
| ADAMS  | 1100.00 |    NULL | N/A                |
| JAMES  |  950.00 |    NULL | N/A                |
| FORD   | 3000.00 |    NULL | N/A                |
| MILLER | 1300.00 |    NULL | N/A                |
+--------+---------+---------+--------------------+
14 rows in set (0.00 sec)
```

Here, comm column contains null value which is replaced by 'N/A'.

- Restricting rows using where clause

Where clause in the query will restrict number of rows in the output based on condition.

Syntax:

SELECT */column list

FROM Tablename

where condition ;

Condition (column_name operator expression)

Relational Operator

> greater than

< less than

>= greater than equal to

<= less than equal to

= equal

! = or <> not equal to

Logical Operator

And – evaluated true if all the logical expression is true otherwise false.Or - evaluated true if any the logical expression is true otherwise false. Logical operator is used to combine two or more logical expression,

Membership Operator

in – Not in

The IN operator allows you to specify multiple values in a WHERE clause.The IN operator is a shorthand for multiple OR conditions.

Comparing NULL

is null – is
not null

NULL (Absence of value) value cannot be compared using Relational operator. The above statement is used to check whether column contains NULL or not.

Range Operator

Between

Pattern Matching

Like
Not Like

Like clause is used to match pattern using two wild card characters
_ (underscore) – single unknown character
% (modulo) - Zero or more unknown characters
e.g.

words staring with 't'	't%'
words ending with 't'	'%t'
words containing 't' -	'%t%'
word with 't' as second letter -	'_t%'
words with 't' as third last character –	'%t_ _'
words containing four letter and 't' as second letter –	'_ t_ _'

- Ordering data using ORDER BY clause
  - ORDER BY clause is used to arrange data in ascending/descending order
  - Ordering can be done on more than one column, in this case data is arrangedaccording first column and then second column and onwards.
  - By default data is arranged in ascending order, in no ordering information (asc/desc)is given.

Syntax:

```
SELECT */col_list
    FROM tablename
ORDER BY col1 asc/desc, col2 asc/desc;
```

Aggregate Functions

- An aggregate function performs a calculation on multiple values and returns a singlevalue.
- These function work on multiple rows collectively return single value.
- List of Aggregate functions are
  - max() : return maximum value in set of value

```
mysql> select max(sal) from emp;
+----------+
| max(sal) |
+----------+
|  5000.00 |
+----------+
1 row in set (0.01 sec)
```

  - min() – return minimum value from the set of values
  - avg() –return average value in set of non-null values
  - sum() - Return the summation of all non-NULL values of the set of values.
  - count() - Return the number of rows in a group
    - Count(*) – return number of rows, including rows with NULL

```
mysql> select count(*) from emp;
+----------+
| count(*) |
+----------+
|       14 |
+----------+
1 row in set (0.00 sec)
```

    - Count(column_name) - return number of rows, excluding rows with NULL for the given column
    - Count (distinct column_name) – return number of rows with duplicateremoved

    In above example there are 14 row in the EMP table, but distinct clause only consider unique value.

- Group By Clause
  - It is used in a SELECT statement to collect data across multiple records and group the results by one or more columns.

Syntax:

```
SELECT column_name, aggregate_function
    FROM table_name
GROUP BY  column_name
```

In above example salary is grouped on job and maximum salary from each job isdisplayed.

- Select clause involving group by clause can contain column present in group by clause, aggregate function or no column. Otherwise it will return random data fromother column as given below.

- **Having clause** –
  - Having clause is used to place condition on aggregate function in conjunction withgroup by clause.
  - Having clause in placed after where clause in select statement.

Syntax:

```
SELECT columm_name, aggregate_function(col_name)
    FROM table
WHERE condition GROUP BY
    column_name
HAVING aggregate_function(column_name) operator expression;
```

The above query will display deptno, maximum salary and number of employees from each department.

The query given below display deptno, maximum salary and number of employees from those department which have maximum salary greater than equal to 3000.

```
mysql> select deptno, max(sal), count(*) from emp
    -> group by deptno having max(sal)>=3000;
+--------+----------+----------+
| deptno | max(sal) | count(*) |
+--------+----------+----------+
|     10 |  5000.00 |        3 |
|     20 |  3000.00 |        5 |
+--------+----------+----------+
```

As condition is on aggregate function max(), where clause can't be used in this case.

Exercise Questions:

1. What is MySQL used for? Abhay wants to start learning MySQL. From where can he obtain the MySQL software ?
2. In the table "Student", Priya wanted to increase the Marks(Column Name:Marks) of those students by 5 who have got Marks below 33. She has entered the following statement:
3. SELECT Marks+5 FROM Student WHERE Marks<33;
   Identify errors(if any) in the above statement. Rewrite the correct SQL statement.
4. Write SQL statement to add a column ''COUNTRY'' with data type and size as VARCHAR(70) to the existing table named ''PLAYER''. Is it a DDL or DML or TCL command ?
5. Table Student has the columns RNO and SCORE. It has 3 rows in it. Following two SQL statements were entered that produced the output (AVG(SCORE) as 45 and COUNT(SCORE) as 2) :
   (i) AVG(SCORE)
   (ii) Count(score)
6. 'Employee' table has a column named 'CITY' that stores city in which each employee resides. Write SQL query to display details of all rows except those rows that have CITY as 'DELHI' or 'MUMBAI' or 'CHANDIGARH'.
7. How is a database related to a table ?

Write SQL query to create the above table with appropriate data types and sizes of columns.

8. Ms. Rajshri is the Class Teacher of Class XII. She wants to create a table named 'Student' to store marks in different subjects of her class. Identify any 4 columns for the table along with their suitable data types.

9. "XYZ" Company conducts workshops for employees of organizations. The company requires data of workshops that are organized. Write SQL query to create a table 'Workshop' with the following structure:

Field	Type	Constraint
WorkshopId	integer	Primary Key
Title	Varchar(50)	
DateWorkshop	Date	
NumSpeakers	Integer	

10. Ariya wants to add another column 'Gender' in the already existing table 'CUSTOMERS'. She has written the following statement. However, it errors. Rewrite the correct statement.
MODIFY TABLE CUSTOMERS GENDER char(1);

11. Explain the following statement with the help of example:
12. "In a transaction either all the SQL statements be committed or all rolled back."
13. How is HAVING clause similar to WHERE clause? How is HAVING clause different from WHERE clause? Explain with the help of examples of each.
14. Consider the following table 'Transporter' that stores the order details about items to be transported. Write SQL commands for the statements (i) to (viii).

Table : TRANSPORTER

ORDERNO	DRIVERNAME	DRIVERGRADE	ITEM	TRAVELDATE	DESTINATION
10012	RAM YADAV	A	TELEVISION	2019-04-19	MUMBAI
10014	SOMNATH		FURNITURE	2019-01-12	PUNE
10016	MOHAN VERMA	B	WASHING MACHINE	2019-06-06	LUCKNOW
10018	RISHI SINGH	A	REFRIGERATOR	2019-04-07	MUMBAI
10019	RADHE MOHAN		TELEVISION	2019-05-30	UDAIPUR
10020	BISHEN PRATAP	B	REFRIGERATOR	2019-05-02	MUMBAI
10021	RAM		TELEVISION	2019-05-03	PUNE

(i) To display names of drivers and destination city where TELEVISION is being transported.
(ii) To display driver names and destinations where destination is not MUMBAI.
(iii) To display the names of destination cities where items are being transported. There should be no duplicate values.
(iv) To display details of rows that have some value in DRIVERGRADE column.
(v) To display names of drivers, names of items and travel dates for those items that are being transported on or before 1st April 2019.
(vi) To display the number of drivers who have 'MOHAN' anywhere in their names.
(vii) To display the names of drivers, item names and travel dates in alphabetic (ascending) order of driver names.
(viii) To display names of drivers whose names are three characters long.

17. In CHAR(10) and VARCHAR(10), what does the number 10 indicate ?

18. 'Employee' table has a column named 'CITY' that stores city in which each employee resides. Write SQL query to display details of all rows except those rows that have CITY as 'DELHI' or 'MUMBAI' or

'CHANDIGARH'.

19.Consider the table given below. Write SQL queries for (i) to (vii).

Table : Gym

REGID	NAME	PREWEIGHT	CURRWEIGHT	DOJ	GENDER	BRANCH
1001	SHEELA SIA	115	98	2017-09-02	F	ADARSH VIHAR
1002	FAWAD KHAN	92	80	2018-10-11	M	MODEL TOWN
1003	PAWAN SINGH	85	80	2018-02-03	M	NIRMAN NAGAR
1004	SUPRIYA ARORA	113	100	2018-01-16	F	MODEL TOWN
1005	AJOY BASU	67	75	2017-12-09	M	NIRMAN NAGAR
1006	TANMAY JACOB	100	71	2017-11-18	M	ADARSH VIHAR
1007	LAKSHMI VENKAT	98	95	2018-06-09	F	MODEL TOWN

Columns REGID stores Registration Id, PREWEIGHT stores weight of the person before joining Gym, CURRWEIGHT stores current weight, DOJ stores Date of Joining, BRANCH stores the branch of Gym where the person has enrolled.

(i) To display names of members along with their previous and current weights who are in Model Town branch.
(ii) To display all names of members, previous weight, current weight, Change in weight (i.e. how much increase from previous weight or decrease from previous weight, Decrease will be displayed with negative sign)
(iii) To display BRANCH wise count of members in the Gym. (i.e. display the BRANCH and number of members in each BRANCH)
(iv) To display names and date of joining of all the members who joined in the year 2018.
(v) To display Names and Current weight of all the members in descending order of Current Weight.
(vi) To display the names and date of joining of male members who have joined after 27th September 2018.
(vii) To display names and date of joining of members who have their names starting with 'S' and ending with 'a'.

20. Consider the table Flight given below, write command in SQL for (i) to (iv) and output for (v) to (viii)

Table : FLIGHT

Flight_No	Origin	Destination	Seats	FlightDate	Rate
1005	Varanasi	Nepal	275	12-Dec-07	3000
2785	Delhi	Kerala	290	17-Jan-08	5500
6587	Mumbai	Varanasi	435	19-Feb-08	5000
1265	Varanasi	Nepal	200	02-Jan-08	5400

4457	Delhi	Lucknow	150	22-Feb-08	4500
6856	Varanasi	Mumbai	180	03-Mar-08	6000

i) To display Flight flying between Varanasi and Nepal.

ii) To display the different Origin of Flights.

iii) To display list of flights in descending order of Rate.

iv) To display flight details of the flight whose flightdate is after Jan 2008.

v) SELECT Flight_No, Destination FROM Flight WHERE Destination LIKE '_u%';

vi) SELECT Origin, COUNT(*) FROM Flight GROUP BY Origin;

vii) SELECT Origin, Destination FROM Flight WHERE seats>400;

viii) SELECT SUM(Rate),MAX(Seats) FROM Flight;

Joins

- A relational database consists of multiple related tables linking together using commoncolumns, which are known as foreign key columns.
- **It is used retrieve data from multiple tables.**
- Consider the tables below EMP, DEPT & SALGARDE that stored related information,all the examples on join will be explained with help of these following three tables

EMP Table

empno	ename	job	mgr	hiredate	sal	comm	deptno
7369	SMITH	CLERK	7902	1993-06-13	800.00	0.00	20
7499	ALLEN	SALESMAN	7698	1998-08-15	1600.00	300.00	30
7521	WARD	SALESMAN	7698	1996-03-26	1250.00	500.00	30
7566	JONES	MANAGER	7839	1995-10-31	2975.00		20
7698	BLAKE	MANAGER	7839	1992-06-11	2850.00		30
7782	CLARK	MANAGER	7839	1993-05-14	2450.00		10
7788	SCOTT	ANALYST	7566	1996-03-05	3000.00		20
7839	KING	PRESIDENT		1990-06-09	5000.00	0.00	10
7844	TURNER	SALESMAN	7698	1995-06-04	1500.00	0.00	30
7876	ADAMS	CLERK	7788	1999-06-04	1100.00		20
7900	JAMES	CLERK	7698	2000-06-23	950.00		30
7934	MILLER	CLERK	7782	2000-01-21	1300.00		10
7902	FORD	ANALYST	7566	1997-12-05	3000.00		20
7654	MARTIN	SALESMAN	7698	1998-12-05	1250.00	1400.00	30

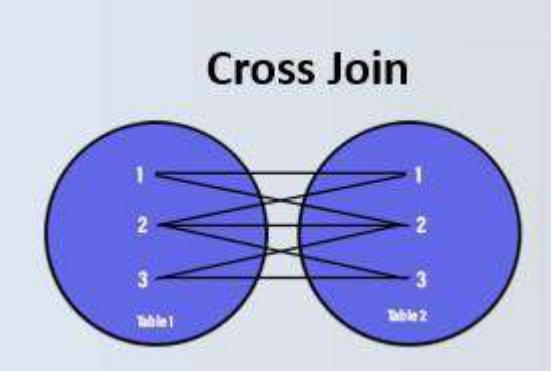
DEPT Table

deptno	dname	location
10	Accounting	New York
20	Research	Dallas
30	Sales	Chicago
40	Operations	Boston

SALGRADE Table

grade	losal	hisal
1	700.00	1200.00
2	1201.00	1400.00
4	2001.00	3000.00
5	3001.00	99999.00
3	1401.00	2000.00

- Types of Join
  - Cartesian Product or Cross join
  - Equi Join
  - Natural Join
  - Non-Equi Join
  - Self Join
  - Left Outer Join
  - Right Outer Join
- Cartesian Product or Cross join
  - The cross join makes a Cartesian product of rows from the joined tables.
  - The cross join combines each row from the first table with every row from theright table to make the result set.
  - If Table1 has degree d1 and cardinality c1 and table2 has degree d2 and cardinality c2, their Cartesian Product has degree d=d1+d2 and cardinalityc=c1*c2;



Ven Diagram

Syntax:

SELECT * FROM table1, table2;Or

SELECT * FROM table1 CROSS JOIN table2;Or

SELECT * FROM table1 JOIN table2;

e.g. SELECT * FROM emp, dept;

SELECT * FROM emp CROSS JOIN dept;SELECT

* FROM emp JOIN DEPT;

Output:

```
+-------+--------+-----------+------+-----------+---------+---------+--------+--------+------------+----------+
| empno | ename  | job       | mgr  | hiredate  | sal     | comm    | deptno | deptno | dname      | loc      |
+-------+--------+-----------+------+-----------+---------+---------+--------+--------+------------+----------+
```

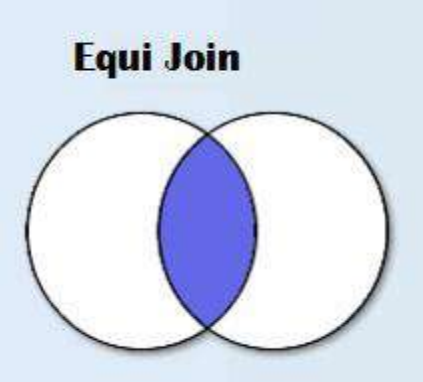
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20	10	ACCOUNTING	NEW YORK
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20	20	RESEARCH	DALLAS
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20	30	SALES	CHICAGO
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20	40	OPERATIONS	BOSTON
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30	10	ACCOUNTING	NEW YORK
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30	20	RESEARCH	DALLAS
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30	30	SALES	CHICAGO
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30	40	OPERATIONS	BOSTON
7521	WARD	SALESMAN	7698	1981-02-22	1250.00	500.00	30	10	ACCOUNTING	NEW YORK
7521	WARD	SALESMAN	7698	1981-02-22	1250.00	500.00	30	20	RESEARCH	DALLAS
7521	WARD	SALESMAN	7698	1981-02-22	1250.00	500.00	30	30	SALES	CHICAGO
7521	WARD	SALESMAN	7698	1981-02-22	1250.00	500.00	30	40	OPERATIONS	BOSTON
7566	JONES	MANAGER	7839	1981-04-02	2975.00	NULL	20	10	ACCOUNTING	NEW YORK
7566	JONES	MANAGER	7839	1981-04-02	2975.00	NULL	20	20	RESEARCH	DALLAS
7566	JONES	MANAGER	7839	1981-04-02	2975.00	NULL	20	30	SALES	CHICAGO
7566	JONES	MANAGER	7839	1981-04-02	2975.00	NULL	20	40	OPERATIONS	BOSTON
7654	MARTIN	SALESMAN	7698	1981-09-28	1250.00	1400.00	30	10	ACCOUNTING	NEW YORK
7654	MARTIN	SALESMAN	7698	1981-09-28	1250.00	1400.00	30	20	RESEARCH	DALLAS
7654	MARTIN	SALESMAN	7698	1981-09-28	1250.00	1400.00	30	30	SALES	CHICAGO
7654	MARTIN	SALESMAN	7698	1981-09-28	1250.00	1400.00	30	40	OPERATIONS	BOSTON
7698	BLAKE	MANAGER	7839	1981-05-01	2850.00	NULL	30	10	ACCOUNTING	NEW YORK
7698	BLAKE	MANAGER	7839	1981-05-01	2850.00	NULL	30	20	RESEARCH	DALLAS
7698	BLAKE	MANAGER	7839	1981-05-01	2850.00	NULL	30	30	SALES	CHICAGO
7698	BLAKE	MANAGER	7839	1981-05-01	2850.00	NULL	30	40	OPERATIONS	BOSTON
7782	CLARK	MANAGER	7839	1981-06-09	2450.00	NULL	10	10	ACCOUNTING	NEW YORK
7782	CLARK	MANAGER	7839	1981-06-09	2450.00	NULL	10	20	RESEARCH	DALLAS
7782	CLARK	MANAGER	7839	1981-06-09	2450.00	NULL	10	30	SALES	CHICAGO
7782	CLARK	MANAGER	7839	1981-06-09	2450.00	NULL	10	40	OPERATIONS	BOSTON
7788	SCOTT	ANALYST	7566	1982-12-09	3000.00	NULL	20	10	ACCOUNTING	NEW YORK
7788	SCOTT	ANALYST	7566	1982-12-09	3000.00	NULL	20	20	RESEARCH	DALLAS
7788	SCOTT	ANALYST	7566	1982-12-09	3000.00	NULL	20	30	SALES	CHICAGO
7788	SCOTT	ANALYST	7566	1982-12-09	3000.00	NULL	20	40	OPERATIONS	BOSTON
7839	KING	PRESIDENT	NULL	1981-11-17	5000.00	NULL	10	10	ACCOUNTING	NEW YORK
7839	KING	PRESIDENT	NULL	1981-11-17	5000.00	NULL	10	20	RESEARCH	DALLAS
7839	KING	PRESIDENT	NULL	1981-11-17	5000.00	NULL	10	30	SALES	CHICAGO
7839	KING	PRESIDENT	NULL	1981-11-17	5000.00	NULL	10	40	OPERATIONS	BOSTON

7844	TURNER	SALESMAN	7698	1981-09-08	1500.00	0.00	30	10	ACCOUNTING	NEW YORK
7844	TURNER	SALESMAN	7698	1981-09-08	1500.00	0.00	30	20	RESEARCH	DALLAS
7844	TURNER	SALESMAN	7698	1981-09-08	1500.00	0.00	30	30	SALES	CHICAGO
7844	TURNER	SALESMAN	7698	1981-09-08	1500.00	0.00	30	40	OPERATIONS	BOSTON
7876	ADAMS	CLERK	7788	1983-01-12	1100.00	NULL	20	10	ACCOUNTING	NEW YORK
7876	ADAMS	CLERK	7788	1983-01-12	1100.00	NULL	20	20	RESEARCH	DALLAS
7876	ADAMS	CLERK	7788	1983-01-12	1100.00	NULL	20	30	SALES	CHICAGO
7876	ADAMS	CLERK	7788	1983-01-12	1100.00	NULL	20	40	OPERATIONS	BOSTON
7900	JAMES	CLERK	7698	1981-12-03	950.00	NULL	30	10	ACCOUNTING	NEW YORK
7900	JAMES	CLERK	7698	1981-12-03	950.00	NULL	30	20	RESEARCH	DALLAS
7900	JAMES	CLERK	7698	1981-12-03	950.00	NULL	30	30	SALES	CHICAGO
7900	JAMES	CLERK	7698	1981-12-03	950.00	NULL	30	40	OPERATIONS	BOSTON
7902	FORD	ANALYST	7566	1981-12-03	3000.00	NULL	20	10	ACCOUNTING	NEW YORK
7902	FORD	ANALYST	7566	1981-12-03	3000.00	NULL	20	20	RESEARCH	DALLAS
7902	FORD	ANALYST	7566	1981-12-03	3000.00	NULL	20	30	SALES	CHICAGO
7902	FORD	ANALYST	7566	1981-12-03	3000.00	NULL	20	40	OPERATIONS	BOSTON
7934	MILLER	CLERK	7782	1982-01-23	1300.00	NULL	10	10	ACCOUNTING	NEW YORK
7934	MILLER	CLERK	7782	1982-01-23	1300.00	NULL	10	20	RESEARCH	DALLAS
7934	MILLER	CLERK	7782	1982-01-23	1300.00	NULL	10	30	SALES	CHICAGO
7934	MILLER	CLERK	7782	1982-01-23	1300.00	NULL	10	40	OPERATIONS	BOSTON

56 rows in set (0.02 sec)

Note: **Above output has 56 row (14*4) and 11 columns (8+3)**

- Equi Join-
  - It performs a JOIN against equality or matching column(s) values of the associatedtables.



Ven Diagram

Syntax

```
SELECT * /Column_list
    FROM Table1, Table 2
WHERE table1.column=Table2.column;Or

SELECT * /Column_list
FROM Table1 join Table2 on Table1.Column=Table2.Column;
```

Example: SELECT * FROM emp JOIN dept ON emp.deptno=dept.deptno;Or

SELECT * FROM emp, dept WHERE emp.deptno=dept.deptno;

Output:

empno	ename	job	mgr	hiredate	sal	comm	deptno	deptno	dname	loc
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL	20	20	RESEARCH	DALLAS
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00	30	30	SALES	CHICAGO
7521	WARD	SALESMAN	7698	1981-02-22	1250.00	500.00	30	30	SALES	CHICAGO
7566	JONES	MANAGER	7839	1981-04-02	2975.00	NULL	20	20	RESEARCH	DALLAS
7654	MARTIN	SALESMAN	7698	1981-09-28	1250.00	1400.00	30	30	SALES	CHICAGO
7698	BLAKE	MANAGER	7839	1981-05-01	2850.00	NULL	30	30	SALES	CHICAGO
7782	CLARK	MANAGER	7839	1981-06-09	2450.00	NULL	10	10	ACCOUNTING	NEW YORK
7788	SCOTT	ANALYST	7566	1982-12-09	3000.00	NULL	20	20	RESEARCH	DALLAS
7839	KING	PRESIDENT	NULL	1981-11-17	5000.00	NULL	10	10	ACCOUNTING	NEW YORK
7844	TURNER	SALESMAN	7698	1981-09-08	1500.00	0.00	30	30	SALES	CHICAGO
7876	ADAMS	CLERK	7788	1983-01-12	1100.00	NULL	20	20	RESEARCH	DALLAS
7900	JAMES	CLERK	7698	1981-12-03	950.00	NULL	30	30	SALES	CHICAGO
7902	FORD	ANALYST	7566	1981-12-03	3000.00	NULL	20	20	RESEARCH	DALLAS
7934	MILLER	CLERK	7782	1982-01-23	1300.00	NULL	10	10	ACCOUNTING	NEW YORK

Example 1: Display the employee name, sal and name of department name

Ans: In the above query ename and sal belong to emp table whereas dname belongs toDEPT table. So, to retrieve data in this we will use join

```
SELECT emp.ename, emp.sal, dept.dname
FROM emp, dept WHERE emp.deptno=dept.deptno;
```

Output:

```
+....+.........+.........+
| ename  | sal       | dname    |
+....+.........+.........+
| SMITH  |  800.00 | RESEARCH  |
| ALLEN  | 1600.00 | SALES          |
| WARD   | 1250.00 | SALES          |
| JONES  | 2975.00 | RESEARCH  |
| MARTIN | 1250.00 | SALES          |
| BLAKE  | 2850.00 | SALES          |
| CLARK | 2450.00 | ACCOUNTING |
| SCOTT  | 3000.00 | RESEARCH  |
| KING  | 5000.00 | ACCOUNTING |
| TURNER | 1500.00 | SALES          |
| ADAMS  | 1100.00 | RESEARCH  |
| JAMES  |  950.00 | SALES          |
| FORD  | 3000.00 | RESEARCH  |
| MILLER | 1300.00 | ACCOUNTING |
+....+.........+.........+Note:
```

- In case of join **full qualified (table_name.column_name)** name is used to avoid ambiguity as both table contains common columns as PRIMARY KEY and FOREIGN KEY.
- Table Alias – Like column alias table alias can be used in case of join as given below.

```
SELECT e.ename, e.sal FROM emp e, dept d WHERE emp.deptno=dept.deptno;
```

- Here ‘e’ & ‘d’ are table alias for EMP & DEPT table respectively.

- Non- Equi Join
  - It uses comparison operator instead of the equal sign like >, <, >=, <= along with join condition.

Syntax:

```
SELECT * /Column_list
    FROM table1, table2,..
WHERE table1.column relational_operator table2.column;
```

Note: Where relational operator are other than equality operator and between.

Example: Display the employee name, salary and grade of each employee.

Ans: In the above query the involved table are EMP and SALGRADE.

```
SELECT e.ename, e.sal, s.grade
    FROM emp e, salgarde s
WHERE e.sal BETWEEN s.losal AND s.hisal;Output:
```

```
+.....+.....+.....+
| ename  | sal       | grade |
+.....+.....+.....+
| SMITH  |  800.00 |        1 |
| ALLEN  | 1600.00 |        3 |
| WARD   | 1250.00 |        2 |
| JONES  | 2975.00 |        4 |
| MARTIN | 1250.00 |        2 |
| BLAKE  | 2850.00 |        4 |
| CLARK  | 2450.00 |        4 |
| SCOTT  | 3000.00 |        4 |
| KING   | 5000.00 |        5 |
| TURNER | 1500.00 |        3 |
| ADAMS  | 1100.00 |        1 |
| JAMES  |  950.00 |        1 |
| FORD   | 3000.00 |        4 |
| MILLER | 1300.00 |        2 |
+.....+.....+.....+
```

- Natural Join
  - A natural join is a type of join operation that creates an implicit join by combiningtables based on columns with the same name and data type.
  - It makes the SELECT query simpler with minimal use of conditions.
  - There is no need to specify the name of common column in the SELECT statement.

- Common column is present only once in the output.

Syntax:

```
SELECT */column_list
FROM Table1 NATURAL JOIN TABLE2;
```

Or

```
SELECT */column_list
FROM TABLE1 join on common_column_name;
```

Example :

```
SELECT * FROM emp JOIN dept USING(deptno);Or
SELECT * FROM emp NATURAL JOIN DEPT;
```

Output:

```
+--------+-------+--------+-----------+------+-----------+---------+---------+-----------+----------+
| deptno | empno | ename  | job | mgr  | hiredate  | sal | comm  | dname    | loc     |
+--------+-------+--------+-----------+------+-----------+---------+---------+-----------+----------+
|    20 |  7369 | SMITH  | CLERK     | 7902 | 1980-12-17 |  800.00 |   NULL | RESEARCH    | DALLAS  |
|    30 |  7499 | ALLEN | SALESMAN  | 7698 | 1981-02-20 | 1600.00 |  300.00 | SALES       | CHICAGO |
|    30 |  7521 | WARD  | SALESMAN  | 7698 | 1981-02-22 | 1250.00 |  500.00 | SALES       | CHICAGO |
|    20 |  7566 | JONES  | MANAGER  | 7839 | 1981-04-02 | 2975.00 |    NULL | RESEARCH   | DALLAS   |
|    30 |  7654 | MARTIN | SALESMAN  | 7698 | 1981-09-28 | 1250.00 | 1400.00 | SALES      | CHICAGO |
|    30 |  7698 | BLAKE  | MANAGER   | 7839 | 1981-05-01 | 2850.00 |    NULL | SALES      | CHICAGO |
|    10 |  7782 | CLARK  | MANAGER   | 7839 | 1981-06-09 | 2450.00 |    NULL | ACCOUNTING | NEW YORK |
|    20 |  7788 | SCOTT  | ANALYST   | 7566 | 1982-12-09 | 3000.00 |    NULL | RESEARCH   | DALLAS   |
|    10 |  7839 | KING   | PRESIDENT | NULL | 1981-11-17 | 5000.00 |    NULL | ACCOUNTING | NEW YORK |
|    30 |  7844 | TURNER | SALESMAN  | 7698 | 1981-09-08 | 1500.00 |    0.00 | SALES      | CHICAGO |
|    20 |  7876 | ADAMS  | CLERK     | 7788 | 1983-01-12 | 1100.00 |   NULL | RESEARCH   | DALLAS   |
|    30 |  7900 | JAMES  | CLERK     | 7698 | 1981-12-03 |  950.00 |    NULL | SALES      | CHICAGO  |
|    20 |  7902 | FORD   | ANALYST   | 7566 | 1981-12-03 | 3000.00 |    NULL | RESEARCH   | DALLAS   |
|    10 |  7934 | MILLER | CLERK     | 7782 | 1982-01-23 | 1300.00 |   NULL | ACCOUNTING | NEW YORK |
+--------+-------+--------+-----------+------+-----------+---------+---------+-----------+----------+
```

- Difference between Equi-Join vs Natural Join

Equi-Join	Natural Join
Join performed on equality of value of the columns	Join is performed on column haing common name.
Where clause is used to specify the condition	There is no need to use where clause
Both columns from tables are displayed in the result.	Common column is displayed only once

Solved Exercise on Join:

Consider the following two table Customer and Saleman

Customer Table:

salesman_id	name	city	commission
5001	James Hoog	New York	0.15
5002	Nail Knite	Paris	0.13
5005	Pit Alex	London	0.11
5006	Mc Lyon	Paris	0.14
5007	Paul Adam	Rome	0.13

Customer Table:

customer_id	cust_name	city	grade	salesman_id
3002	Nick Rimando	New York	100	5001
3007	Brad Davis	New York	200	5001
3005	Graham Zusi	California	200	5002
3008	Julian Green	London	300	5002
3004	Fabian Johnson	Paris	300	5006
3009	Geoff Cameron	Berlin	100	5003
3003	Jozy Altidor	Moscow	200	5007

Q1. Write a SQL query to display Salesman, cust_name and city from above table where the salesperson and customer belongs to same city.

Ans:

```
SELECT s.name AS "Salesman",
    c.cust_name, c.city
FROM salesman s,customer c
    WHERE s.city=c.city;
Or
SELECT salesman.name AS "Salesman",
    customer.cust_name, customer.city
    FROM salesman,customer
WHERE salesman.city=customer.city;
```

Q2. write a SQL query to display ord_no, purch_amt, cust_name, city of those orders whereorder amount exists between 500 and 2000.

Ans:

```
SELECT  o.ord_no,o.purch_amt,
```

```
c.cust_name,c.city

FROM orders o,customer c

WHERE o.customer_id=c.customer_id

AND o.purch_amt BETWEEN 500 AND 2000;
```

Q3. Write a SQL query to display Customer Name, city, Salesman, commission the all salesperson(s) and their respective the customer(s).

Ans:

```
SELECT c.cust_name AS "Customer Name",c.city,

    s.name AS "Salesman", s.commission FROM

    customer c, salesman s

    WHERE c.salesman_id=s.salesman_id;
```

Q4. What are Joins in SQL?

Ans. Joins in SQL are the statements or clauses using which we can combine two or more tables, based on some common fields present among the tables.

Q5.Explain the different types of Joins in SQL?Ans:

Some of the major joins in SQL are-

- Equi Join – Inner join is used to return the records which are having matching valuesin both the tables.
- Left Join – Left join is used to concatenate all the rows of the left table and thematching rows in the right table.
- Right Join-Right join is used to concatenate all the rows of the right table and thematching rows in the left table.
- Full Join-Full join is used to return all the records of both the tables as long as there isa matching record in either table.
- Self Join-Self join is a join that is used to join a table to itself. In a self-join, a table is considered as if it were two tables.
- Cartesian Join-Cartesian join is used to return the number of rows in the first table multiplied by the number of rows in the second table. It is also referred to as cross join.

Q6. What is Natural Join?

Ans: Natural join is used to create an implicit join clause based on the value of common attributesin the two tables. Common attributes are the attributes that have the same name in both tables. Natural join does not need any comparison operator as in the case of equi join.

Q7. What is an Equi Join?

Ans: An Equi Join is a type of join that combines tables based on matching values in the specified columns.

- ❖ The column names do not need to be the same.
- ❖ The resultant table can contain repeated columns.
- ❖ It is possible to perform an equi join on more than two

tables.Q 8. What is the difference between cross join and natural join?

Ans: A cross join produces a cross product or cartesian product of two tables whereas the natural join is based on all the columns having the same name and data types in both the tables.

Unsolved Exercise:

1. Consider the following tables PARTICIPANT and ACTIVITY and answer the questions that follow :

Table : PARTICIPANT

ADMNO	NAME	HOUSE	ACTIVITYCODE
6473	Kapil Shah	Gandhi	A105
7134	Joy Mathew	Bose	A101
8786	Saba Arora	Gandhi	A102
6477	Kapil Shah	Bose	A101
7658	Faizal Ahmed	Bhagat	A104

Table : ACTIVITY

ACTIVITYCODE	ACTIVITYNAME	POINTS
A101	Running	200
A102	Hopping bag	300
A103	Skipping	200
A104	Bean bag	250
A105	Obstacle	350

(i) When the table ‘‘PARTICIPANT’’ was first created, the column ‘NAME’ was planned as the Primary key by the Programmer. Later a field ADMNO had to be set up as Primary key. Explain the reason.

OR

Identify data type and size to be used for column ACTIVITYCODE in table ACTIVITY.

(ii) To display Names of Participants, Activity Code, Activity Name in alphabetic ascending order of names of participants.

(iii) To display Names of Participants along with Activity Codes and Activity Names for only those participants who are taking part in Activities that have ‘bag’ in their Activity Names and Points of activity are above 250.

2. In a database there are two tables ‘LOAN’ and ‘BORROWER’ as shown below:

Table: LOAN

Loan_no	Branch_name	Amount
K-70	Downtown	5000
K-230	Redwood	6000
K-260	Perryridge	3700

Table : BORROWER

Customer_Name	Loan_no
Jones	K-170
Smith	K-230
Hayes	K-155

(i) Identify the foreign key column in the table BORROWER.

(ii) How many rows and columns will be there in the cross join of these two tables?

(iii) Write sql query to display customer smith's loan record with their Name, Loan _no, Branch _name and Loan amount

(iv) Write sql query to list names of all customers with their Amount in ascending order?

Interface of Python with an SQL database

- The real world application need to store data persistently
- The front end (User Interface) is designed in Python or any other programming language and Data stored in database (Backend).
- Therefore, there is need to connect Python application and Database.
- The connectivity is achieved through API called MySQL-Connector.
- It needs to be installed using **pip command** on Command Prompt
  - Press Window +R to open Run Window
  - Type CMD press enter
  - It will open Command Prompt
  - Move to Script Folder of Python, if Python Path is not set
    CD C:\Users\Your_User_Name\AppData\Local\Programs\Python\Python310\Scripts
  - Run Following command
    pip install mysql-connector

```
C:\Users\MICROSOFT>pip install mysql-connector
Collecting mysql-connector
  Downloading mysql-connector-2.2.9.tar.gz (11.9 MB)
     |████████████████████████████████| 11.9 MB 1.1 MB/s
Using legacy 'setup.py install' for mysql-connector, since package 'wheel' is not installed.
Installing collected packages: mysql-connector
    Running setup.py install for mysql-connector ... done
Successfully installed mysql-connector-2.2.9
```

  - To check whether it is installed or not, use **pip list** command.
- **Step to Connect Python to MySQL**
  - Import MySQL Connector to your program
    import mysql.connector
  - Establish connection using mysql.connector connect() method. This method will generated ER_ACCESS_DENIED_ERROR is password is wrong.
    mycon=mysql.connector.connect((host="localhost",user="root",password="", database='test')

    host : - server name on which MySQL is running, default is localhost (127.0.0.1) for local machine

    user : user_name of MySQL, default is 'root'

    password : - Password for user 'root', default is no password i. e. ""
    database: - Name of MySQL database to connect

  - Create Cursor using method of connection object's (mycon) cursor() method
    mycursor=mycon.cursor()
  - Execute the query using cursor method execute(SQL_Command),

result_set=mycursor.execute('SELECT * FROM EMP;")

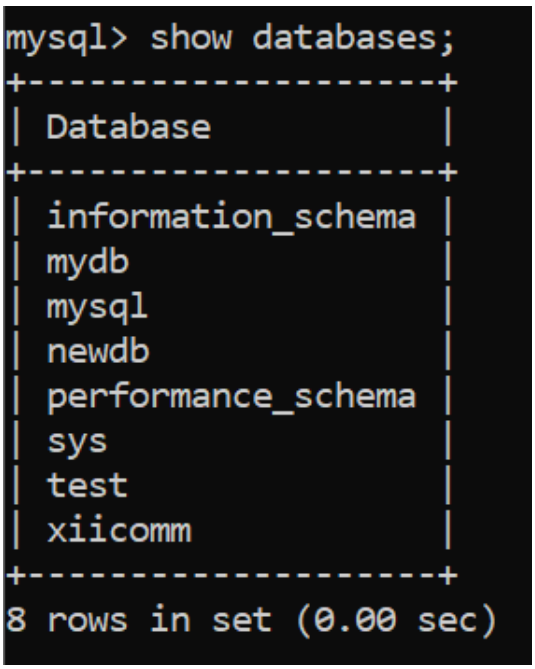
- Result_set object holds all the record (rows) returned by execute() method
- Perform required operations using various cursor method
- Close Cursor using close() method of Cursor object
  mycursor.close()

- Close Database connection using close() method connection objectMycon.close()
- Other method
  - is_connected()- It is a connection method and return true is connection isestablished otherwise false.
    myconn.is_connected()
  - commit() – it is a method of connection object and save the same made bytransaction.
    myconn.commit()
  - rollback() – it is a method of connection object that undo all the changesmade.
    Myconn.rollback()

  - fetchone() – It is method of cursor object that fetches next one row of a queryresult set.
  - Fetchall() – it is another method of cursor object that fetches all the rows inthe result set.
  - rowcount()- it is a method of cursor object that returns the number of rowsaffected by execute() method.

➢ Creating Database from Python

Listing database in MySQL before the execution of the code



Code:

```
In [3]:
1 import mysql.connector
2 con=mysql.connector.connect(host='localhost',user='root',password='',database='test')
3 cur=con.cursor()
4 cur.execute("create database School")
5
```

Result of Show databases command after the code.

```
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mydb               |
| mysql              |
| newdb              |
| performance_schema |
| school             |
| sys                |
| test               |
| xiicomm            |
+--------------------+
```

- Listing database from Python

```
1 import mysql.connector
2 con=mysql.connector.connect(host='localhost',user='root',password='',database='test')
3 cur=con.cursor()
4 cur.execute("show databases")
5 result_set=cur.fetchall() #read all record in result_set
6
7 for r in result_set:
8     print(r)
```

Output:

```
('information_schema',)
('mydb',)

('mysql',)

('newdb',)
('performance_schema',)
('school',)

('sys',)

('test',)

('xiicomm',)
```

- Reading table data

```
import mysql.connector
con=mysql.connector.connect(host='localhost',user='root',password='',database='test')
cur=con.cursor()
cur.execute("select * from emp")
result_set=cur.fetchall() #read all record in result_set

for r in result_set:
    print(r)
```

- Updating Records

Details of Persons table before updating

```
mysql> select * from Persons;
+----------+----------+-----------+-----------+--------+
| PersonID | LastName | FirstName | Address   | City   |
+----------+----------+-----------+-----------+--------+
|        1 | Rohit    | prakash   | 1 Enclave | Ranchi |
|        2 | Mohit    | Kumar     | 1 Enclave | Patna  |
|        3 | Danush   | K         | 2 Enclave | Ranchi |
|        4 | Dev      | Singh     | 2 Enclave | Ranchi |
+----------+----------+-----------+-----------+--------+
```

Code:

```
#Program to update
import mysql.connector
con=mysql.connector.connect(host='localhost',user='root',password='',database='test')
cur=con.cursor()
name=input("Enter name of the person to update Address")
add=input("Enter New Address")
sql='update persons set address=' + "'" + add +"' " + 'where lastname=' + "'" + name +"' "
cur.execute(sql)
con.commit() # save the changes made
print(cur.rowcount,"records updated")
cur.close()
con.close()
```

Output:

```
Enter name of the person to update Address Rohit
Enter New Address Patna

1 records updated
```

Details of Persons table after updating

```
mysql> select * from Persons;
+----------+----------+-----------+-----------+--------+
| PersonID | LastName | FirstName | Address   | City   |
+----------+----------+-----------+-----------+--------+
|        1 | Rohit    | prakash   | Patna     | Ranchi |
|        2 | Mohit    | Kumar     | 1 Enclave | Patna  |
|        3 | Danush   | K         | 2 Enclave | Ranchi |
|        4 | Dev      | Singh     | 2 Enclave | Ranchi |
+----------+----------+-----------+-----------+--------+
```

- Deleting Record

Details of Persons table before deleting the row

Code:

```
#Program to delete row
import mysql.connector
con=mysql.connector.connect(host='localhost',user='root',password='',database='test')
cur=con.cursor()
pid=input("Enter name of the person person to delete record : ")
sql='delete from  persons where personid= {}'.format(pid)
try:
    cur.execute(sql)
    con.commit() # save the changes made
    print(cur.rowcount,"records updated")
except:
    con.rollback() #undo the changes

cur.close()  #closing the cursor
con.close()  #closing the connection
```

```
Enter name of the person person to delete record : 1
1 records updated
```

Details of Persons table after deleting record with Personid= 1

```
mysql> select * from Persons;
+----------+----------+-----------+-----------+--------+
| PersonID | LastName | FirstName | Address   | City   |
+----------+----------+-----------+-----------+--------+
|        2 | Mohit    | Kumar     | 1 Enclave | Patna  |
|        3 | Danush   | K         | 2 Enclave | Ranchi |
|        4 | Dev      | Singh     | 2 Enclave | Ranchi |
+----------+----------+-----------+-----------+--------+
```

Exercise:

1. What is the role of execute() method?
2. What is the significance of using connect()?
3. Explain the following method of cursor object
    a. fetchone()
    b. rowcount
    c. fetchall()
4. What is Python's database interface known as?

Class: XII Session: 2022-23 Computer

Science (083)

Sample Question Paper (Theory)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
8. All programming questions are to be answered using Python Language only.

	SECTION A	
1.	Which of the following is an invalid statement? a. abc=1,000,000 c. a b c=100 200 300 b. a, b, c= 100,200,300 d. a=b=c=100	1
2.	Which of the following operators has the highest precedence? (a) << (b) ** (c)% (d)and	1
3.	What will be the output of the following Python code snippet? d1 = {"john":40, "peter":45} d2 = {"john":466, "peter":45} d1 > d2 a) True b) False c) Error d) None	1

4.	What will be the value of the given expression? 3+3.00, 3**3.0 (a) (6.0, 27.0) (b) (6.0, 9.00) (c) (6,27) (d) [6.0,27.0] (e) [6,27]	1
5.	Select the correct output of the code: a = "foobar" a = a.partition("o") (a) ["fo","","bar"] (b) ["f","oo","bar"] (c) ["f","o","bar"] (d) ("f","o","obar")	1

6.	If a text file is opened in w+ mode, then what is the initial position of file pointer/cursor? (a) Beginning of file (b) End of the file (c) Beginning of last line of text file (d) Undetermined	1
7.	Fill in the blank: _____Keyword is used to set foreign key in SQL. (a) foreign key (b)unique (c) references (d)primary	1
8.	Which of the following commands will change the datatype of the table in MYSQL? (a) DELETE TABLE (b) DROP TABLE (c) REMOVE TABLE (d) ALTER TABLE	1
9.	For a user defined function with header def start (x, y, z=10), Which of the following function call statements will generate an error? (a) start(10) (b) start(x = 10,y = 20) (b) start(y = 20, x = 10) (d) All of the above	1
10.	Fill in the blank: _____ refers to a situation of keeping the same data in different formats in two different tables (a) data redundancy (b) data privacy (c) data inconsistency (d) data integrity	1

11.	What is the binary file mode associated with “file must exist, otherwise error will be raised and reading and writing can take place”? (a) ‘wb+’ (b) ‘w+’ (c) ‘rb’ (d) ‘rb+’	1
12.	Fill in the blank: Group by clause uses _____ clause to apply conditions on aggregate rows (a) where (b) order by (c) sort (d) having	1
13.	Fill in the blank: What kind of transmission medium is most appropriate to carry data in a computer network that is exposed to electrical interferences? a. Unshielded twisted pair b. Optical fiber c. Coaxial cable d. Microwave	1

14.	If x = 12 and y = '12', then what will be the output of the following code? print(x*2, y*2, sep="") (a) 2424 (b) 24 24 (c) 241212 (d) 24 1212	1
15.	Which of the following is not a built in aggregate function in SQL? a) avg b) max c) total d) count	1
16.	Name the method which is used for displaying only one resultset. (a) fetchmany (b) fetchno (c) fetchall (d) fetchone	1
	Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as a. Both A and R are true and R is the correct explanation for A b. Both A and R are true and R is not the correct explanation for A c. Both A and R are false. d. A is True but R is False e. A is false but R is True	
17.	Assertion (A): Parameters with default arguments can be followed by parameters with no default argument. Reason (R): Syntactically, it would be impossible for the interpreter to decide which values match which arguments if mixed modes were allowed while providing default arguments.	1
18.	Assertion (A): Local Variables are accessible only within a function or block in which it is declared Reason (R): Global variables are accessible in the whole program.	1
	SECTION B	
19.	Correct the following code segment: DEF say(message, times = 1) print(message * times , end : ' ') say(times=10, 'Hello and') say('World')	2

20.	Write two points of difference between Circuit Switching and Packet Switching. **OR** Write two points of difference between Coaxial and fiber.	2
21.	Find the output. (a) def example(a): a = a+2 a=a*2 return a >>>print(example("hello")) (b) Sum = 0 for k in range(10 , 1, -2): Sum = Sum+k print(Sum)	1 1
22.	Explain the referential integrity constraint. What conditions must be met in order to set referential integrity?	2
23.	(a) Write the full forms of the following: (i) CDMA (ii) SLIP (b) What is the use of HTTP?	2
24.	Predict the output of the Python code given below: def modifyList(x): x.append(sum(x)) print(x, end= ‘ ’) L = [1,2,3,4] print(L, end= ‘ ’) modifyList(L)	2

print(L)

OR

Predict the output of the Python code given below:

```
l1 = [10,15,16,18,20]
l1.remove(15)
l1.insert(1,30)
print (l1[::-2])
```

25. 2

Table: PRODUCTS

PID	PNAME	QTY	PRICE	COMPANY	SUPCODE
101	DIGITAL CAMERA 14X	120	12000	RENBIX	SO1
102	DIGITAL PAD 11i	100	22000	DIGI POP	S02
104	PEN DRIVE 16 GB	500	1100	STOREKING	SO1
106	LED SCREEN 32	70	28000	DISPEXPERTS	S02
105	CAR GPS SYSTEM	60	12000	MOVEON	S03

Table: SUPPLIERS

SUPCODE	SNAME	CITY
SO1	GET ALL INC	KOLKATA
SO3	EASY MARKET CORP	DELHI
S02	DIGI BUSY GROUP	CHENNAI

(a) Find the Degree and Cardinality of the Cartesian product of the Supplier and Product relations.

(b) Identify the foreign key in the given tables, also mention in which table it is appearing as a foreign key?

OR

Find output:

(a) select *from product p, supplier s where p.supcode=s.supcode;

(b) select *from product natural join supplier;

SECTION C

26	(a) Create the connection of Python with MYSQL, in which (1) User=Admin Password= Admin2123 Database Name=System (b) Write the output of the queries (a) to (d) based on the table, Staff given below: Table: Staff Write the output of the queries (a) to (d) based on the table, Staff given below: **Table: Staff** **Id** | **Name** | **DOJ** | **Dept** | **Gender** | **Exp** 1 | Aman | 12-01-2006 | Finance | M | 15 2 | Dima | 03-05-2016 | Personnel | F | 5 3 | Christina | 15-11-2009 | Sales | F | 12 4 | Shem | 20-12-2006 | Sales | M | 15 5 | Roshan | 13-10-2013 | Finance | M | 8 6 | Danish | 11-09-2013 | Personnel | M | 8 7 | Habeena | 16-08-2011 | Sales | F | 10 (a) Select avg(exp) from staff where gender = 'F'; (b) Select min(doj) from staff; (c) Select *from staff where gender!='M' and dept like '_ _ _ _ _'; (d) Select name, doj from staff where dept not in ('Finance','Sales');	1+2
27.	Assume that a text file named TEXT1.TXT already contains some text written into it, write a program with a function named vowelwords(), that reads the file TEXT1.TXT and create a new file named TEXT2.TXT , which shall contain only those words from the file TEXT1.TXT which don't start with an uppercase vowel(i.e. with 'A','E','I','O','U') for example if the file TEXT1.TXT contains Carry Umbrella and Overcoat When it Rains then the file TEXT2.TXT shall contain Carry and when it Rains. OR Write a Python program to count all the line having 'a' as last character.	3

28.	Dileep has to create a database named Company in MYSQL. He now needs to create a table named Employee in the database to store the records of employees in the company. The table Employee has the following structure:	3

<table>
<tr><td></td><td>Table: Employee

<table><tr><th>Field Name</th><th>Data type</th><th>Remarks</th></tr><tr><td>Empid</td><td>integer of size 5</td><td>Primary Key</td></tr><tr><td>Empname</td><td>character of size 25</td><td>Not null</td></tr><tr><td>Desgn</td><td>character of size 15</td><td>Unique</td></tr><tr><td>Salary</td><td>floating point</td><td></td></tr><tr><td>DOB</td><td>date</td><td></td></tr></table>
Help him to complete the task by suggesting appropriate SQL commands.</td><td></td></tr>
<tr><td>29.</td><td>Write a function merge_tuple(t1,t2), where t1 and t2 are the tuples of elements passed as argument to the function. The function returns another tuple named that stores the sum of consecutive element of t1 and t2, only if they are of same length else return -1

For example:

T1=(1,2,3,4)
T2=(5,6,7,8)
Then function should return
(6,8,10,12)

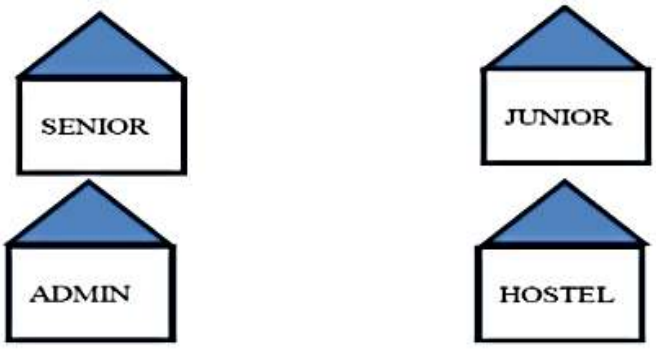
And if
T1=(1,2,3)
T2=(5,6,7,8)
Then function should return
-1</td><td>3</td></tr>
<tr><td>30.</td><td>Rajiv has created a dictionary containing employee names and their salaries as key value pairs of 6 employees.

Write a program, with separate user defined functions to perform the following operations:

● Push the keys (employee name) of the dictionary into a stack, where the corresponding value (salary) is less than 85000.</td><td>3</td></tr>
</table>

	● Pop and display the content of the stack. For example: If the sample content of the dictionary is as follows: Emp={"Ajay":76000, "Jyothi":150000, "David":89000, "Remya":65000, "Karthika":90000, "Vijay":82000} The output from the program should be: Vijay Remya Ajay **OR** Aruna has a list containing temperatures of 10 cities. You need to help her create a program with separate user defined functions to perform the following operations based on this list. ● Traverse the content of the list and push the negative temperatures into a stack. ● Pop and display the content of the stack. For Example: If the sample Content of the list is as follows: T=[-9, 3, 31, -6, 12, 19, -2, 15, -5, 38] Sample Output of the code should be: -5 -2 -6 -9	

	SECTION D	
31.	Excel Public School, Coimbatore is setting up the network between its different wings of school campus. There are 4 wings namely SENIOR(S), JUNIOR (J), ADMIN (A) and HOSTEL (H).	5



Distances between various wings are given below:

Wing A to Wing S	100m
Wing A to Wing J	200m
Wing A to Wing H	400m
Wing S to Wing J	300m
Wing S to Wing H	100m
Wing J to Wing H	450m

Number of Computers installed at various wings are as follows:

Wings	Number of Computers
Wing A	20
Wing S	150
Wing J	50
Wing H	25

(a) Suggest the best-wired medium and mention the topology or layout to connect various wings of Excel Public School, Coimbatore.

(b) Name the most suitable wing to house the server. Justify your answer.

(c) Suggest placement of HUB/SWITCH in the network of the School.

(d) Suggest a device that can provide wireless Internet access to all smartphone/laptop users in the campus of Excel Public School, Coimbatore.

	(e) Draw suitable layout to connect all four wings of Excel Public School	

32.	(a) Write the output of the code given below:
	
	x = 10
	def localvar():
	  global x
	  x+=5
	  print(x, end=' ')
	  print(x+5, end=' ')
	localvar()
	print(x, end=' ')
	
	(b) following code establishes connectivity between Python and MYSQL:
	
	_____ #statement 1
	dataBase = mysql.connector.connect(
	host ="localhost",
	user ="user",
	passwd ="password",
	database = "gfg"
	)
	
	# preparing a cursor object
	cursorObject = _____ #statement 2
	
	# creating table
	studentRecord = """CREATE TABLE STUDENT (
	NAME VARCHAR(20) NOT NULL,
	BRANCH VARCHAR(50),
	ROLL INT NOT NULL,
		2+3

	SECTION VARCHAR(5), AGE INT)""" # table created cursorObject._____ #statement 3 # disconnecting from server dataBase.close(Write the following missing statements to complete the code: Statement 1 – to import requisite module Statement 2 – to form the cursor object Statement 3- to execute the command that creates table	

33.	What is the advantage of using a csv file for permanent storage? Write a program to (a) add/insert records in file "data.csv". Structure of a record is roll number, name and class. (b) search and display record for a given class O R A binary file "emp.dat" has structure [EID, Ename, designation, salary]. I.Write a user defined function CreateEmp() to input data for a record and add to emp.dat. II.Write a function display() in Python to display the detail of all employees.	5
SECTION E		

34	Write SQL queries for (a) to (d) based on the tables PASSENGER and FLIGHT given below: Table : **PASSENGER** 	PNO	NAME	GENDER	FNO
---	---	---	---
1001	Suresh	MALE	F101
1002	Anita	FEMALE	F104
1003	Harjas	MALE	F102
1004	Nita	FEMALE	F103 | Table: **FLIGHT** | FNO	START	END	F_DATE	FARE
---	---	---	---	---
F101	MUMBAI	CHENNAI	2021-12-25	4500
F102	MUMBAI	BENGALURU	2021-11-20	4000
F103	DELHI	CHENNAI	2021-12-10	5500
F104	KOLKATA	MUMBAI	2021-12-20	4500
F105	DELHI	BENGALURU	2021-01-15	5000		1+1+2
	(a) what will be the degree and cardinality of the resulting relation after Cartesian product of above relations? (b) what will be the degree and cardinality of the resulting flight after addition of two rows and deletion of one column? (c) (i) Write a query to display the **NAME,** corresponding **FARE** and **F_DATE** of all PASSENGERS who have a flight to **START** from DELHI. (ii) Write a query to delete the records of flights which end at Mumbai. OR (c) create a new table traveller having same fields and tuples as passenger.	

35.	Sudev, a student of class 12th, is learning CSV File Module in Python. During examination, he has been assigned an incomplete python code to create a CSV file 'customer.csv'. Help him in completing the code which creates the desired CSV file.	5

Cus_No	Name	Ph_No
11	Rohit	8567843243
12	Sonal	9645342345

```
_________csv  #Statement  1
def Create_CSV():
    fw=open("customer.csv","w")
     _________=csv.writer(fw)                    #Statement2
    csvwriter.writerow(["Cus_No","Name","Ph_No"])
    n=int(input("Enter total number of Customer"))
   for i in range(n):
          cusno=int(input("Enter    Customer    no."))
          Name=input("EnterName")
          Ph_No=int(input("EnterPhone          No."))
          Rec=[cusno,Name,Ph_No]
          csvwriter.writerow(_______) #Statement 3
   fw.close()
```

```
def Display_CSV():
    fr=open(_____,"r")  #Statement  4
    cusreader=csv.reader(fr)
    i=0
    for_____in cusreader: #Statement 5if
        i%2==0:
            print(rec[0],'\t',rec[1],'\t',rec[2])
        else:
            pass
        i+=1
    fr.close()

Create_CSV()
Display_CSV()
```

I. Identify suitable code for the blank space in line marked as Statement-
a) include
b) add
c) Import
d) import

II. Identify the missing code for the blank space in line marked as Statement-2.
a) Customer
b) reader
c) csvwriter
d) writer

III. Identify the argument name for the blank space in line marked as Statement-3?
a) Row
b) Rec
c) row
d) rec

IV. Identify the missing file name for the blank space in line marked as Statement-4?
a) customer
b) customer.csv
c) customer.txt
d) customer.dat

V. Identify the object name for the blank space in line marked as Statement-5?
a) i
b) Rec
c) row
d) rec

Class: XII Session: 2022-23 Computer

Science (083)

Marking Scheme

	SECTION A	
1.	c. a b c=100 200 300	1
2.	(b) **	1
3.	c) Error	1
4.	(a) (6.0, 27.0)	1
5.	(d) ("f","o","obar")	1
6.	(a) Beginning of file	1
7.	(c) references	1
8.	(d) ALTER TABLE	1
9.	(c) start(10)	1
10.	(c) data inconsistency	1
11.	(d) 'rb+'	1
12.	(d) having	1
13.	b. Optical fiber	1
14.	(c) 241212	1
15.	c) total	1

<table>
<tr><td>16.</td><td>(d) fetchone</td><td>1</td></tr>
<tr><td>17.</td><td>e. A is false but R is True</td><td>1</td></tr>
<tr><td>18.</td><td>b. Both A and R are true and R is not the correct explanation for A</td><td>1</td></tr>
<tr><td colspan="3">SECTION B</td></tr>
<tr><td>19.</td><td>Correct the following code segment:
<u>def</u> say(message, times = 1)<u>:</u>
print(message * times , end <u>=</u> ’ ‘)
say<u>(‘Hello and’,times=10)</u>
<u>say('World')</u></td><td>2</td></tr>
<tr><td>20.</td><td>Any two point of difference
Circuit Switching Vs Packet Switching
<table><tr><th>Circuit Switching</th><th>Packet Switching</th></tr><tr><td>Physical path between source and destination</td><td>No physical path</td></tr><tr><td>All packets use same path</td><td>Packets travel independently</td></tr><tr><td>Reserve the entire bandwidth in advance</td><td>Does not reserve</td></tr><tr><td>Bandwidth Wastage</td><td>No Bandwidth wastage</td></tr><tr><td>No store and forward transmission</td><td>Supports store and forward transmission</td></tr></table>3
. OR</td><td>2</td></tr>
</table>

	<table><tr><th>BASIS FOR COMPARISON</th><th>OPTICAL FIBRE</th><th>COAXIAL CABLE</th></tr><tr><td>Basic</td><td>Transmission of the signal is in optical form (light form).</td><td>Transmission of the signal is in electrical form.</td></tr><tr><td>Composition of the cable</td><td>Glass and plastics</td><td>Plastic, metal foil and metal wire (usually copper).</td></tr><tr><td>Losses in cable</td><td>Dispersion, bending, absorption and attenuation.</td><td>Resistive, radiated and dielectric loss.</td></tr><tr><td>Efficiency</td><td>High</td><td>Low</td></tr><tr><td>Cost</td><td>Highly expensive</td><td>Less expensive</td></tr><tr><td>Bending effect</td><td>Can affect the signal transmission.</td><td>Bending of wire does not affect the signal transmission.</td></tr></table>	
21.	(a) typeerror (b) 30	1+1
22.	Referential integrity refers to **the relationship between tables**. Because each table in a database must have a primary key, this primary key can appear in other tables because of its relationship to data within those tables. When a primary key from one table appears in another table, it is called a foreign key . • Referential integrity requires that **a foreign key must have a matching primary key or it must be null**. • This constraint is specified between two tables (parent and child); • it maintains the correspondence between rows in these tables. • It means the reference from a row in one table to another table must be valid.	1+1
23.	***CDMA***: Code Division Multiple Access SLIP : **Serial Line Internet Protocol** hypertext Transfer Protocol (HTTP) is an application-layer protocol for **transmitting hypermedia documents, such as HTML**. It was designed for communication between web browsers and web servers	1+1
24.	[1,2,3,4] [1,2,3,4,10] [1,2,3,4,10] OR	2

[20, 16, 10]

25. 2

Table: PRODUCTS

PID	PNAME	QTY	PRICE	COMPANY	SUPCODE
101	DIGITAL CAMERA 14X	120	12000	RENBIX	SO1
102	DIGITAL PAD 11i	100	22000	DIGI POP	S02
104	PEN DRIVE 16 GB	500	1100	STOREKING	SO1
106	LED SCREEN 32	70	28000	DISPEXPERTS	S02
105	CAR GPS SYSTEM	60	12000	MOVEON	S03

Table: SUPPLIERS

SUPCODE	SNAME	CITY
SO1	GET ALL INC	KOLKATA
SO3	EASY MARKET CORP	DELHI
S02	DIGI BUSY GROUP	CHENNAI

(a) Degree= 9 cardinality = 15
(b) Supcode in product table
OR

Find output:
(a)

PID	PNAME	QTY	PRICE	COMPANY	SUPCODE	SUPCODE	SNAME	CITY
101	DIGITAL CAMERA 14X	120	12000	RENBIX	S01	S01	GET ALL IN	KOLKATA
102	DIGITAL PAD 11I	100	22000	DIGI POP	S02	S02	DIGI BUSY GROUP	CHENNAI
104	PENDRIVE 16GB	500	1100	STOREKING	S01	S01	GET ALL IN	KOLKATA
106	LED SCREEN 32	70	28000	DISPEXPERTS	S02	S02	DIGI BUSY GROUP	CHENNAI
105	CAR GPS SYSTEM	60	12000	MOVEON	SO3	SO3	EASY MARKET CORP	DELHI

(b)

PID	PNAME	QTY	PRICE	COMPANY	SUPCODE	SNAME	CITY
101	DIGITAL CAMERA 14X	120	12000	RENBIX	S01	GET ALL IN	KOLKATA

102	DIGITAL PAD 11I	100	22000	DIGI POP	S02	DIGI BUSY GROUP	CHENNAI
104	PENDRIVE 16GB	500	1100	STOREKING	S01	GET ALL IN	KOLKATA
106	LED SCREEN 32	70	28000	DISPEXPERTS	S02	DIGI BUSY GROUP	CHENNAI
105	CAR GPS SYSTEM	60	12000	MOVEON	SO3	EASY MARKET CORP	DELHI

SECTION C

26 (a) import mysqlconnector as myc

mycon=myc.connect(host="localhost" user="Admin" passwd="Admin123" databse="System") — 1

(b) Write the output of the queries (a) to (d) based on the table, Staff given below: — 0.5 X4

Table: Staff

Write the output of the queries (a) to (d) based on the table, Staff given below:

Table: Staff

Id	Name	DOJ	Dept	Gender	Exp
1	Aman	12-01-2006	Finance	M	15
2	Dima	03-05-2016	Personnel	F	5
3	Christina	15-11-2009	Sales	F	12
4	Shem	20-12-2006	Sales	M	15
5	Roshan	13-10-2013	Finance	M	8
6	Danish	11-09-2013	Personnel	M	8
7	Habeena	16-08-2011	Sales	F	10

(a) 5.66

(b) 12-01-2006

(c) 3 Christina 15-11-2009 Sales F 12

7 habeena 16-08-2011 Sales F 10

(d) Dima 03-05-2016

Danish 11-09-2013

27. f1=open("TEXT1.TXT") — 3

f2=open("TEXT2.TXT","w")

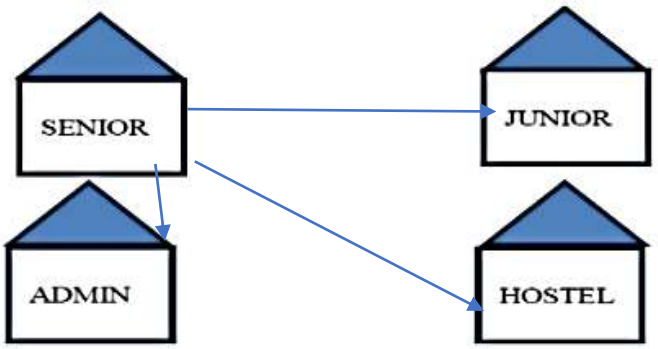
	data=f1.read().split()
	for word in data:
	if word[0] not in “AEIOU”:
	f2.write(word, “ “)
	f1.close()
	f2.close()
	
	OR
	
	f1=open(“TEXT1.TXT”)
	data=f1.readlines()
	for line in data:
	if line.strip()[-1]==”a”:
	print(line)
	f1.close()	

28.	Create table Employee(Empid int(5) primary key, Empname char(25) not null, Design char(15) unique , Salary float, DOB date);	3

29.	def merge_tuple(t1,t2):
	t3=( )
	if len(t1)==len(t2):
	for i in range(len(t1)):
	t3[i]=t1[i]+t2[i]
	return t3
	return -1
		3

30.	def push(d, stack):
	for key in d:
	if d[key]<85000:
	stack.append(key)
	
	def pop(stack):
	if stack==[ ]:
	print("underflow")
	else:
	print(stack.pop())
	OR
	def push(l, stack):
	for ele in l:
	if ele<0:
	stack.append(ele)
	
	def pop(stack):
	if stack==[ ]:
	print("underflow")
		3

	else: print(stack.pop())	

	SECTIO N D	
31.	(a) Star topology , optical fibre or coaxial  (b) S wing as it has maximum no. of computers resulting in maximum internal traffic as per 80:20 rule (c) hub/Switch should be place in all the wings (d) WiFi Router OR WiMax OR RF Router OR Wireless Modem OR RFTransmitter (e) any suitable layout	
32.	(a) 15 20 15 (b) Statement 1 – import mysql.connector Statement 2 – database.cursor() Statement 3- execute(studentRecord)	2+3
33.	(any 2) • CSV is human readable and easy to edit manually. • CSV is simple to implement and parse. • CSV is processed by almost all existing applications. • CSV provides a straightforward information schema.	1+2+2 OR 2+3

- CSV is faster to handle.
- CSV is smaller in size.
- CSV is considered to be standard format.

Write a program to

(a)

```
import csv
field = ["Roll no" , "Name" , "Class"]
f = open("data.csv" , 'w')
d=csv.writer(f)
d.writerow(field)
ch='y'
while ch=='y' or ch=='Y':
    rn=int(input("Enter Roll number: "))
    nm = input("Enter name: ")
    cls = input("Enter Class: ")
    rec=[rn,nm,cls]
    d.writerow(rec)
    ch=input("Enter more record??(Y/N)")
f.close()
```

(b) **f=open("data.csv","r")**

data=csv.reader()

cls=input("class to search record")

for row in data:

```
        If row[2]==Cls:

            print(row)
```

OR

I.

```
import pickle
def CreateEmp():
    f1=open("emp.dat",'wb')
    eid=input("Enter E. Id")
    ename=input("Enter Name")
    designation=input("Enter Designation")
    salary=int(input("Enter Salary"))
    l=[eid,ename,designation,salary]
    pickle.dump(l,f1)
    f1.close()
```

II.

```
import pickle
def display():
    f2=open("emp.dat","rb")
    while True:
        try:
            rec=pickle.load(f2)
            print(rec['eid'],rec['ename'],rec['designation'],rec['salary'])
        except EOFError:
            break
```

	f2.close()	
	SECTION E	
34	(a) degree = 9 cardinality = 20 (b) degree = 8 cardinality = 28 (c) (i) Select Name, fare, f_date from passenger p, flight f where p.fno=f.fno and start=”DELHI”; (ii) delete from flight where end=”MUMBAI”; OR (c) Create table traveller as select * from passenger;	1+1+2
35.	I. d) import II. c) csvwriter III. d) rec IV. b) customer.csv V. d) rec	5

KENDRIYA VIDYALAYA SANGATHAN - MUMBAI REGION

Sample Question Paper

Class: XII | Time: 3 Hours

Subject: Computer Science | Max. Marks: 70

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A has 18 questions carrying 1 mark each.
4. Section B has 7 very short answer type questions carrying 2 marks each.
5. Section C has 5 short answer type questions carrying 3 marks each.
6. Section D has 3 long answer type questions carrying 5 marks each.
7. Section E has 2 long answer type questions carrying 4 marks each.
8. Internal choices are given in few questions.
9. All programming questions are to be answered using PYTHON language only.

SECTION - A

1 Identify the name(s) from the following that cannot be used as identifiers in Python: 1

asaword22, 22ndyear, date26-10-2022, _my_file_2

2 Name the datatype for the following: 1

a. 'True'

b. 2.46E-2

3 Consider the following dictionary: 1

machine = {'id':1001, 'name':'UPS', 'capacity':5000, 'rate':15000.00}

Write a statement to change the capacity to 4500.

4 What will be the result of following expression: 1

10>12 and "a"+1<55

a. True

b. False

c. Error

d. None

5 What will be the output of the following: 1

```
str = "Cricket World Cup in Australia"
str2 = str[:7] + " " + str[18:] + "."
print(str2)
```

6 Which of the file opening mode will not create a new file if file does not exist: 1

a. r

b. w

c. a

d. There is not such file opening mode

7 Fill in the blank: 1

Command used to remove a column/attribute from the table/relation is _____.

a. Update
b. Drop
c. Alter
d. Remove

8 Shridharan created a database namely work. Now he wants to create a table in it. For this he needs to open the database he created. Write command to open the database that is created by Shridharan. 1

9 What will be the output of the following code: 1

```
address = '42/B/III, Van-Vihar Colony, Nagpur'
str = address.replace('/','@')
print(address)
```

10 Fill in the blank: 1

The attribute which is a candidate key but not a primary key is known as _____.

11 Which of the following gives the result as string when applied to text file in Python: 1

a. read( )
b. readline( )
c. readlines( )
d. get( )

12 When following command is run the result yielded 20 rows: 1

```
SELECT * FROM Clock;
```

But when following command is run; it yielded 17 rows only:

```
SELECT name FROM Clock;
```

Can you state the reason for the difference?

13 Which of the following is used for remote login: 1

a. VoIP
b. HTTP
c. IMAP
d. TELNET

14 What will be the output of the following statement: 1

```
print(30/5+(16+6))
```

15 Rajiv ran following two commands: 1

```
SELECT count(commission) FROM Employee;
SELECT count(*) FROM Employee;
```

Output of first command is 8 where output of second command is 14. What is the reason for the difference?

16 After executing any DML command from Python in Python-Mysql connectivity, following is necessary to execute in order to make the changes permanent in MySQL: 1

a. save( )
b. store( )
c. commit( )

d. update( )

Questions 17 and 18 are ASSERTION (A) and REASONING ® based questions. Mark the correct choice as

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.

17 Assertion (A): Inside a function if we make changes in a string it will reflect back to the original string. 1
Reason (R): String is an immutable datatype and it is called by value.

18 Assertion (A): In CSV file there is a blank line after every record. 1
Reason (R): Default value of newline is '\n' in open( ) statement used with csv file.

SECTION - B

19 Following code is having some errors. Rewrite the code after correcting and underlining each correction: 2

```
x == 20
def printme( ):
    y = x + 10
    sum = 0
    for i in range(x,y)
        if i%3=0:
            sum=sum+i+1
        Elseif:
            sum += 2
    return(sum)
```

20 Write one advantage and one disadvantage of using Fiber Optic Cable. 2

OR

Write two differences between Circuit Switching and Packet Switching.

21 What will be the output of the following code: 2

```
sub = "083 Comp. Sc. & 065 Info. Prac."
n = len(sub)
s=''
for i in range(n):
    if sub[i].isupper( ):
        s = s + sub[i].lower( )
    elif sub[i].islower( ):
        s = s + sub[i]
    elif sub[i].isdigit( ):
        s = s + 'x'
    elif sub[i].isspace( ):
        pass
    else:
        s = s + '!'
print(s)
```

22 Define Foreign Key. Identify foreign key from the following tables: 2

Table: Bank_Account

Acctno	Name	BCode	Type
1001	Amrita	A2	Savings
1002	Parthodas	A3	Current
1005	Miraben	A2	Current

Table: Branch

Code	City
A1	Delhi
A2	Mumbai
A3	Nagpur

23 a. What is the full form of SMTP and HTTP? 1

b. What is the use of POP3? 1

24 What will be the output of the following code: 2

```
def Call4Change( ):
    for i in range(len(lst)):
        if lst[i]%2==0:
            lst[i]+=1
        elif lst[i]%3==0:
            lst[i]+=2
        elif lst[i]%5==0:
            lst[i]+=4
        else:
            lst[i]=0
lst = [1, 2, 9, 5, 12, 6, 7, 3, 10, 8, 11, 4]
Call4Change( )
print(lst)
```

OR

What will be the output of the following code:

```
def Value2New(M, N=10):
    M = M + N
    N = N*2
    if N%10==0:
        N=N/5
    return(M,N)
P,Q = Value2New(100,20)
print(P,'#',Q)
P,Q = Value2New(50)
print(P,'#',Q)
```

25 Name the SQL function that will be used in following situations:

a. To find the average salary paid to employees. ½

b. To find the month in which an employee is hired. ½

c. To find position of a substring in customer name. ½

d. To find 40% of totalmarks rounded to 2 decimal places. ½

OR

Consider the following tables and write queries for a and b:

Table: Bank_Account

Acctno	Name	BCode	Type
1001	Amrita	A2	Savings
1002	Parthodas	A3	Current
1005	Miraben	A2	Current

Table: Branch

Code	City
A1	Delhi
A2	Mumbai
A3	Nagpur

a. To list Acctno, Name and City of those accounts whose Account Type is Current. 1

b. To display Acctno and Name of those accounts whose Code is A2. 1

SECTION - C

26 Consider the following tables and answer the questions a and b:

Table: Garment

GCode	GName	Rate	Qty	CCode
G101	Saree	1250	100	C03
G102	Lehanga	2000	100	C02
G103	Plazzo	750	105	C02
G104	Suit	2000	250	C01
G105	Patiala	1850	105	C01

Table: Cloth

CCode	CName
C01	Polyester
C02	Cotton
C03	Silk
C04	Cotton-Polyester

a. What will be output of the following command:

SELECT * FROM GARMENT NATURAL JOIN CLOTH; 1

b. What will be the output of following commands:

i. SELECT DISTINCT QTY FROM GARMENT;

ii. SELECT SUM(QTY) FROM GARMENT GROUP BY CCODE HAVING COUNT(*)>1; ½ ½

iii. SELECT GNAME, CNAME, RATE FROM GARMENT G,CLOTH C WHERE G.CCODE = C.CCODE AND QTY>100; ½

iv. SELECT AVG(RATE) FROM GARMENT WHERE RATE BETWEEN 1000 AND 2000; ½

27 Write a function countbb( ) in Python, which reads the contents from a text file 'article.txt' and displays number of occurrences of words 'bat' and 'ball' (in all possible cases) to the screen. 3

Example:

If the content of file article.txt is as follows:

Bat and ball games are field games played by two opposing teams. Action starts when the defending team throws a ball at a dedicated player of the attacking team, who tries to hit it with a bat and run between various safe areas in the field to score runs (points). The defending team can use the ball in various ways against the attacking team's players to force them off the field when they are not in safe zones, and thus prevent them from further scoring. The best known modern bat and ball games are cricket and baseball, with common roots in the 18th-century games played in England.

The countbb( ) function should display as:

Number of times bat occurs is 3

Number of times ball occurs is 5

OR

Write a function SOnly( ) in Python, which reads the contents from a text file 'news.txt' and creates another file 'modnews.txt'. New file contains only those lines that starts with an alphabet.

Example:

If the content of file news.txt is as follows:

This is Peter from California.

24th street is where I live.

__name__ is used in Python functions.

User defined functions is what I am presently reading.

Upon execution of function Sonly( ) file modnews.txt should contain:

This is Peter from California.

User defined functions is what I am presently reading.

28 Consider following tables and write queries for situation a and b. Find the output of c and d:

Table: CLUB

CoachID	CoachName	Age	Sports	Dateofapp	Pay	Sex
1	KUKREJA	35	KARATE	1996-03-27	1000	M
2	RAVINA	34	KARATE	1998-01-20	1200	F
3	KARAN	34	SQUASH	1998-02-19	2000	M
4	TARUN	33	BASKETBALL	1998-01-01	1500	M
5	ZUBIN	36	SWIMMING	1998-01-12	750	M
6	KETAKI	36	SWIMMING	1998-02-24	800	F
7	ANKITA	39	SQUASH	1998-02-20	2200	F
8	ZAREEN	37	KARATE	1998-02-22	1100	F
9	KUSH	41	SWIMMING	1998-01-13	900	M
10	SHAILYA	37	BASKETBALL	1998-02-19	1700	M

Table: COACHES

Sportsperson	Sex	Coach_No
AJAY	M	1
SEEMA	F	2
VINOD	M	1
TANEJA	F	3

a. To list names of all coaches with their date of appointment in descending order.

b. To display total pay given to coaches in each sport. 1

c. SELECT Sportsperson, Coachname FROM Club, Coaches WHERE Coachid = Coach_no; 1

d. SELECT Sex, MAX(Dateofapp), MIN(Dateofapp) FROM Club GROUP BY Sex; ½ ½

29 Write a function SumDiv(L,x), where L is a list of integers and x is an integer; passed as arguments to the function. The function returns the sum of elements of L which are divisible by x or x+1. 3

For example,

If L Contains [10, 27, 12, 20, 22] and x is 5

Then function returns 42 (10+12+20)

30 A nested list contains the records of Mobiles in the following format: 3

[[modelno, name, price], [modelno, name, price], [modelno, name, price],....]

Write the following user defined functions to perform given operations on the stack named Mobile:

a. Push operation – To push details (modelno, name, price) of those mobiles which has price lower than 10000. Make a note that there cannot be more than 20 elements in stack Mobile.

b. Pop operation – To pop elements from stack one by one and display them. Also, display "Underflow" when stack becomes empty.

For example,

If the list contains

[['V20', 'Vivo 20 SE', 18000], ['S11', 'Lava S11', 8900], ['i88', 'IPro 88 SE', 6500], ['ip13', 'iPhone 13', 125000]]

The stack should contain:

['i88', 'IPro 88 SE', 6500]

['S11', 'Lava S11', 8900]

The Output should be:

['i88', 'IPro 88 SE', 6500]

['S11', 'Lava S11', 8900]

Underflow

OR

A Dictionary Medal contains the details of schools and medals won by them in following format {school_name:medals_won}.

Write a function Push(Medal) in Python that pushes those school names in stack named SCHOOL which has won more than 3 medals. Maximum capacity of stack SCHOOL is 15. Function also shows number of items pushed in stack. If number of items exceeds 15 then it shows OVERFLOW.

For example:

If dictionary Medal contains

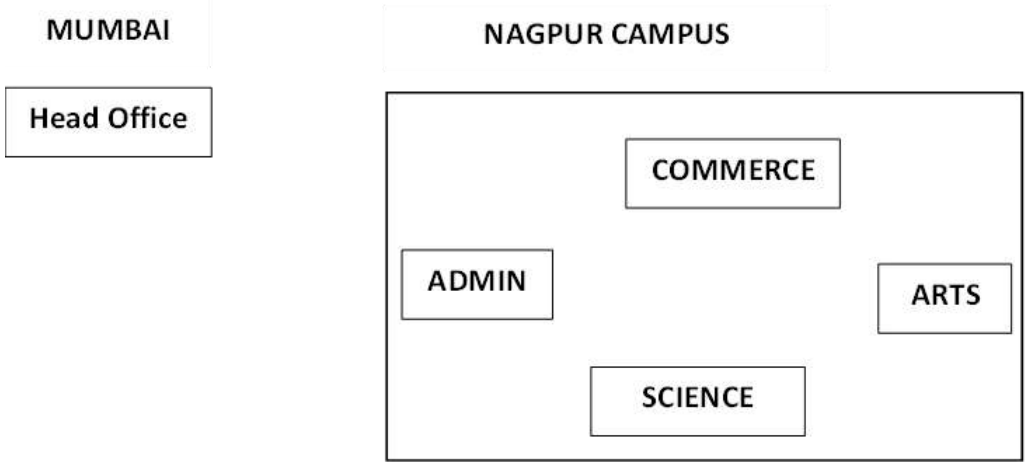
{'KV1':5, 'KV2':2, 'KV3':4, 'KV4':1, 'KV5':7}

Then stack should contain

KV5
KV3
KV1
The output should be:
Number of item pushed in stack Medal are 3

SECTION D

31 Superior Education Society is an educational Organization. It is planning to setup its Campus at Nagpur with its head office at Mumbai. The Nagpur Campus has 4 main buildings – ADMIN, COMMERCE, ARTS and SCIENCE.
You as a network expert have to suggest the best network related solutions for their problems raised in a to e, keeping in mind the distances between the buildings and other given parameters:



Shortest distances between various buildings:
ADMIN to COMMERCE – 55 m
ADMIN to ARTS – 90 m
ADMIN to SCIENCE – 50 m
COMERCE to ARTS – 55 m
COMMERCE to SCIENCE – 50 m
ARTS to SCIENCE – 45 m
MUMBAI Head Office to NAGPUR Campus – 850 KM
Number of Computers installed at various buildings are as follows:
ADMIN – 110
COMMERCE – 75
ARTS – 40
SCIENCE – 12
MUMBAI Head Office – 20

a. Suggest the most appropriate location of the server inside the Nagpur Campus to get the best connectivity for maximum number of computers. Justify your answer. 1

b. Suggest and draw the cable layout to efficiently connect various buildings within the Nagpur campus for connecting the computers. 1

1

c. Which of the following will you suggest to establish the online face-to-face communication between the people in the ADMIN office of Nagpur Campus and Mumbai Head office?

i. Cable TV
ii. E-mail
iii. Video Conferencing 1
iv. Text Chat

d. Suggest the placement of following devices with appropriate reasons:

i. Switch/Hub 1
ii. Repeater

e. Suggest the device/software to be installed in Nagpur Campus to take care of data security and unauthorized access.

32 a. Write the output of the Code given below: 2

```
x = 15
def add(p=2, q=5):
    global x
    x = p+q+p*q
    print(x,end='@')
m = 20
n = 5
add(m,n)
add(q=10, p = -3)
```

b. The code given below inserts the following record in table Garment: 3

GCode – integer
GName – string
Rate – decimal
Qty – integer
CCode = integer

Write missing Statements (Statement 1, Statement 2 and Statement 3) to complete the code:

```
import mysql.connector as mycon
cn = mycon.connect(host='localhost', user='test', password='None', database='cloth')
cur = _____ #Statement 1
while True:
    GCode = int(input("Enter Garment Code = "))
    GName = input("Enter Garment Name = ")
    Rate = float(input("Enter Rate = "))
    Qty = int(input("Enter Quantity = "))
    CCode = int(input("Enter Cloth Code = "))
    q = "insert into Garment Values ({}, '{}', {}, {}, {}".format(GCode, GName, Rate, Qty, CCode)
    cur._____(q) #Staatement 2
    _____ #Statement 3
    ans = input("Do you have more records (Y/N)=")
    if ans.upper()=='N':
```

```
            break
print("Records Successfully Saved")
cn.close()
```

OR

a. Write the output of the Code given below: 2

```
def Timing(T, m=0):
    print("Present Time is",end=':')
    if m>10 and m<=20:
        print("Quarter Past",T)
    elif m<=40:
        print("Half Past",T)
    elif m<=59:
        print("Quarter to",T+1)
    else:
        print("Incorrect Minutes")
Timing(5,18)
Timing(11)
Timing(12,60)
```

b. The code given below reads those records from table Garment which has Qty less than 50. Records in table Garments are stored with following attributes: 3

GCode – integer
GName – string
Rate – decimal
Qty – integer
CCode = integer

Write missing Statements (Statement 1, Statement 2 and Statement 3) to complete the code:

```
import mysql.connector as mycon
cn = mycon.connect(host='localhost', user='test', password='None',
database='cloth')
cur = _____          #Statement 1
cur._____            #Staatement 2 (Create & Execute Query)
G = _____            #Statement 3Read complete result of query
print("Required records are:")
for i in G:
    print(i)
cn.close()
```

33 What is the difference between CSV file and Text File? Write a program in Python that defines and calls the following functions: 5

Insert() – To accept details of clock from the user and stores it in a csv file 'watch.csv'. Each record of clock contains following fields – ClockID, ClockName, YearofManf, Price. Function takes details of all clocks and stores them in file in one go.

Delete() – To accept a ClockID and removes the record with given ClockID from the file 'watch.csv'. If ClockID not found then it should show a relevant message. Before removing the record it should print the record getting removed.

OR

Give one advantage of using CSV file over Binary file. Write a program in Python that defines and calls the following functions: 5

saving( ) – To accepts details of equipments from the user in following format (ID, Name, Make, Price) and save it in a csv file 'parts.csv'. Function saves one record at a time.

search( ) – To accept two prices and displays details of those equipments which has price between these two values.

SECTION E

34 Mayanti just started to work for a sports academy having several branches across India. The sports academy appoints various trainers to train various sports. She has been given the task to maintain the data of the trainers. She has made a table called TRAINERS in the database which has following records:

Table: TRAINER

TrainerNo	Name	City	HireDate	Salary
101	SUNAINA	MUMBAI	1998-10-15	90000
102	ANAMIKA	DELHI	1994-12-24	80000
103	DEEPTI	CHANDIGARH	2001-12-21	82000
104	MEENAKSHI	DELHI	2002-12-25	78000
105	RICHA	MUMBAI	1996-01-12	95000
106	MANIPRABHA	CHENNAI	2001-12-12	69000

Based on the data given above answer the following questions:

a. Can City be used as Primary key for table TRAINER? Justify your answer. 1

b. What is the degree and cardinality of the table TRAINER? If we add two rows and remove three rows from table TRAINER. Also if we add another attribute in the table, what will be the degree and cardinality of the table TRAINER will become? 1

c. Write statements for:

i. Insert a new record in table TRAINER with values, TrainerNo = 107, Name = Swastik, HireDate = 1999-01-22, Salary = 90000. 1

ii. Increase the salary of those Trainer having city as DELHI by 5000. 1

OR

c. Write Statements for:

i. Removes those records from table TRAINER who were hired after year 2000. 1

ii. Add a new column Grade with datatype as Varchar and maximum size as 2. 1

35 Tarun Nair is working under XYZ Incorporation which deals with exporting of goods to foreign countries. To keep track of inventory he is creating a Python program to store the information of item number and quantity in a binary file inventory.dat. For that he has written the following code. Go through the code given and solve problems given below:

```
def write(ino,qty):
    F = open(_____)          #Mark 2
```

```
        L= _____________          #Mark 3
        L.append([ino,qty])
        F.close()
        F=open('inventory.dat','wb')
        pickle.dump(L,F)
        F.close()

def Receive(ino,qty):
        F=open("inventory.dat","rb")
        L=pickle.load(F)
        F.close()
        for i in range(len(L)):
                if L[i][0] == ino:
                        L[i][1] += qty
        F=open("inventory.dat",'wb')
        pickle.dump(L,F)
        _____________                  #Mark 4

def Sent(ino,qty):
        with open("inventory.dat","rb") as F:
                L=pickle.load(F)
                for i in range(len(L)):
                        if L[i][0] == ino:
                                L[i][1] -= qty
        with open("inventory.dat",'wb') as F:
                pickle.dump(L,F)
```

a. Write statement to open the file at Mark 2 to read records from the file. 1

b. Write statement at Mark 3 to read the content of binary file in list L. 1

c. Write statement at Mark 4 to close the file. 1

d. Why there is no need to close the file in function Sent()? 1

****

KENDRIYA VIDYALAYA SANGATHAN - MUMBAI REGION

Marking Scheme

Class: XII Time: 3 Hours

Subject: Computer Science Max. Marks: 70

---

1 Identify the name(s) from the following that cannot be used as identifiers in Python: asaword22, 22ndyear, date26-10-2022, _my_file_2

Answer:

22ndyear, date26-10-2022

½ mark for each correct answer

2 Name the datatype for the following:

a. 'True'

b. 2.46E-2

Answer:

a. String or str

b. Float or Number

½ mark for each correct answer

3 Consider the following dictionary:

machine = {'id':1001, 'name':'UPS', 'capacity':5000, 'rate':15000.00}

Write a statement to change the capacity to 4500.

Answer:

machine['capacity'] = 4500

1 mark for the correct answer

4 What will be the result of following expression:

10>12 and "a"+1<55

a. True

b. False

c. Error

d. None

Answer:

b. False

1 mark for the correct answer

5 What will be the output of the following:

```
str = "Cricket World Cup in Australia"
str2 = str[:7] + " " + str[18:] + "."
print(str2)
```

Answer:

Cricket in Australia.

1 mark for the correct answer

6 Which of the file opening mode will not create a new file if file does not exist:

a. r

b. w

c. a

d. There is not such file opening mode

Answer:

a. R

1 mark for the correct answer

7 Fill in the blank:

Command used to remove a column/attribute from the table/relation is _____.

a. Update
b. Drop
c. Alter
d. Remove

Answer:

c. Alter

1 mark for the correct answer

8 Shridharan created a database namely work. Now he wants to create a table in it. For this he needs to open the database he created. Write command to open the database that is created by Shridharan.

Answer:

Use work;

1 mark for the correct answer

½ mark if only Use is written.

9 What will be the output of the following code:

```
address = '42/B/III, Van-Vihar Colony, Nagpur'
str = address.replace('/','@')
print(address)
```

Answer:

42/B/III, Van-Vihar Colony, Nagpur

1 mark for the correct answer

10 Fill in the blank:

The attribute which is a candidate key but not a primary key is known as _____.

Answer:

Alternate Key

1 mark for the correct answer

11 Which of the following gives the result as string when applied to text file in Python:

a. read( )
b. readline( )
c. readlines( )
d. get( )

Answer:

a. read() and b. readline()

½ mark each for each correct answer

12 When following command is run the result yielded 20 rows:

SELECT * FROM Clock;

But when following command is run; it yielded 17 rows only:

SELECT name FROM Clock;

Can you state the reason for the difference?

Answer:

First command displays all columns from the table Clock but second command shows only name column. Difference between output rows is because three rows have NULL values for name column.

1 mark for the correct answer

13 Which of the following is used for remote login:

a. VoIP
b. HTTP
c. IMAP
d. TELNET

Answer:

d. TELNET

1 mark for the correct answer

14 What will be the output of the following statement:

```
print(30/5+(16+6))
```

Answer:

28.0

1 mark for the correct answer

15 Rajiv ran following two commands:

```
SELECT count(commission) FROM Employee;
SELECT count(*) FROM Employee;
```

Output of first command is 8 where output of second command is 14. What is the reason for the difference?

Answer:

First command counts commission column whereas second command counts rows present in the table. Reason for difference is that there are 6 rows in tables having NULL for column commission.

1 mark for the correct answer

16 After executing any DML command from Python in Python-Mysql connectivity, following is necessary to execute in order to make the changes permanent in MySQL:

a. save()
b. store()
c. commit()
d. update()

Answer:

c. commit()

1 mark for the correct answer

17 Assertion (A): Inside a function if we make changes in a string it will reflect back to the original string.

Reason (R): String is an immutable datatype and it is called by value.

Answer:

d. A is false but R is true

1 mark for the correct answer

18 Assertion (A): In CSV file there is a blank line after every record.

Reason (R): Default value of newline is '\n' in open() statement used with csv file.

Answer:

a. Both A and R are true and R is the correct explanation of A.

1 mark for the correct answer

19 Following code is having some errors. Rewrite the code after correcting and underlining each correction:

```
x == 20
def printme( ):
    y = x + 10
    sum = 0
    for i in range(x,y)
        if i%3=0:
            sum=sum+i+1
        Elseif:
            sum += 2
    return(sum)
```

Answer:

```
x = 20
def printme():
    y = x + 10
    sum = 0
    for i in range(x,y):
        if i%3==0:
            sum=sum+i+1
        elif:
            sum += 2
    return(sum)
```

½ mark each for each correct correction

20 Write one advantage and one disadvantage of using Fiber Optic Cable.

OR

Write two differences between Circuit Switching and Packet Switching.

Answer:

Advantages (any one):

1. **Fiber Optic Cable has very fast speed.**
2. **Fiber Optic Cables are immune to noise or attenuation.**

Disadvantages (any one):

1. **Fiber Optic Cables are very costly.**
2. **Fiber Optic Cables are difficult to maintain**

½ mark for correct advantage and ½ mark for correct disadvantage

OR

1. **In circuit switching a dedicated path is established between sender and receiver, whereas, in packet switching no dedicated path is established between sender and receiver.**
2. **In circuit switching there is no delay in data transmission, whereas, packet switching experiences delay in data transmission.**
3. **In circuit switching there is no issue of congestion or garbled messages, whereas, in packet switching congestion and garbled messages is a common issue.**

4. **Circuit switching required long setup time, whereas, packet switching requires no setup time.**

1 mark each for each correct difference (maximum 2 marks)

21 What will be the output of the following code:

```
sub = "083 Comp. Sc. & 065 Info. Prac."
n = len(sub)
s=''
for i in range(n):
    if sub[i].isupper():
        s = s + sub[i].lower()
    elif sub[i].islower():
        s = s + sub[i]
    elif sub[i].isdigit():
        s = s + 'x'
    elif sub[i].isspace():
        pass
    else:
        s = s + '!'
print(s)
```

Answer:

xxxcomp!sc!!xxxinfo!prac!

½ mark for correct display of x

½ mark for correct display of !

½ mark for correct conversion of uppercase to lowercase

½ mark for not converting lowercase too uppercase

22 Define Foreign Key. Identify foreign key from the following tables:

Table: Bank_Account

Acctno	Name	BCode	Type
1001	Amrita	A2	Savings
1002	Parthodas	A3	Current
1005	Miraben	A2	Current

Table: Branch

Code	City
A1	Delhi
A2	Mumbai
A3	Nagpur

Answer:

A non-key attribute in a relation which is a primary key in another table can be used to establish relationship between these tables. Such an attribute is known as foreign key in table where it is not a primary key.

BCode attribute in table Bank_Account is a foreign key for Code attribute of table Branch.

1 mark for correct definition of Foreign Key

1 mark for correct identification of Foreign Key in example

23 a. What is the full form of SMTP and HTTP?

b. What is the use of POP3?

Answer:

a. **SMTP → Simple Mail Transfer Protocol**
HTTP → HyperText Transfer Protocol

½ mark each for each correct expansion.

b. **POP3 or Post Office Protocol version 3 is used to access mailbox and download e-mail messages to the local computer.**

1 mark for correct answer

24 What will be the output of the following code:

```
def Call4Change( ):
    for i in range(len(lst)):
        if lst[i]%2==0:
            lst[i]+=1
        elif lst[i]%3==0:
            lst[i]+=2
        elif lst[i]%5==0:
            lst[i]+=4
        else:
            lst[i]=0
lst = [1, 2, 9, 5, 12, 6, 7, 3, 10, 8, 11, 4]
Call4Change( )
print(lst)
```

OR

What will be the output of the following code:

```
def Value2New(M, N=10):
    M = M + N
    N = N*2
    if N%10==0:
        N=N/5
    return(M,N)
P,Q = Value2New(100,20)
print(P,'#',Q)
P,Q = Value2New(50)
print(P,'#',Q)
```

Answer:

[0, 3, 11, 9, 13, 7, 0, 5, 11, 9, 0, 5]

½ mark for correct conversion to 0

½ mark for correct addition of 1

½ mark for correct addition of 2

½ mark for correct addition of 4

OR

120 # 8.0

60 # 4.0

1 mark each for each correct output

25 Name the SQL function that will be used in following situations:

a. To find the average salary paid to employees.

b. To find the month in which an employee is hired.

c. To find position of a substring in customer name.

d. To find 40% of totalmarks rounded to 2 decimal places.

OR

Consider the following tables and write queries for a and b:

Table: Bank_Account

Acctno	Name	BCode	Type
1001	Amrita	A2	Savings
1002	Parthodas	A3	Current
1005	Miraben	A2	Current

Table: Branch

Code	City
A1	Delhi
A2	Mumbai
A3	Nagpur

a. To list Acctno, Name and City of those accounts whose Account Type is Current.

b. To display Acctno and Name of those accounts whose Code is A2.

Answer:

a. AVG()

b. MONTH()

c. INSTR()

d. ROUND()

½ mark each for each correct answer

OR

a. SELECT ACCTNO, NAME, CITY FROM BANK_ACCOUNT, BRANCH WHERE BCODE = CODE AND TYPE = 'Current';

b. SELECT ACCTNO, NAME FROM BANK_ACCOUNT WHERE BCODE = 'A2';

1 mark each for each correct answer

26 Consider the following tables and answer the questions a and b:

Table: Garment

GCode	GName	Rate	Qty	CCode
G101	Saree	1250	100	C03
G102	Lehanga	2000	100	C02
G103	Plazzo	750	105	C02
G104	Suit	2000	250	C01
G105	Patiala	1850	105	C01

Table: Cloth

CCode	CName
C01	Polyester
C02	Cotton
C03	Silk
C04	Cotton-Polyester

a. What will be output of the following command:

SELECT * FROM GARMENT NATURAL JOIN CLOTH;

b. What will be the output of following commands:

i. SELECT DISTINCT QTY FROM GARMENT;

ii. SELECT SUM(QTY) FROM GARMENT GROUP BY CCODE HAVING COUNT(*)>1;

iii. SELECT GNAME, CNAME, RATE FROM GARMENT G,CLOTH C WHERE G.CCODE = C.CCODE AND QTY>100;

iv. SELECT AVG(RATE) FROM GARMENT WHERE RATE BETWEEN 1000 AND 2000;

Answer:

a.

```
+-------+-------+---------+------+------+-----------+
| ccode | gcode | gname   | rate | qty  | cname     |
+-------+-------+---------+------+------+-----------+
| C03   | G101  | Saree   | 1250 |  100 | Silk      |
| C02   | G102  | Lehanga | 2000 |  100 | Cotton    |
| C02   | G103  | Plazzo  |  750 |  105 | Cotton    |
| C01   | G104  | Suit    | 2000 |  250 | Polyester |
| C01   | G105  | Patiala | 1850 |  105 | Polyester |
+-------+-------+---------+------+------+-----------+
```

1 mark for complete correct output

½ mark for partially correct output

b.

i.

```
+------+
| qty  |
+------+
|  100 |
|  105 |
|  250 |
+------+
```

ii.

```
+-----------+
| SUM(QTY) |
+-----------+
|       355 |
|       205 |
+-----------+
```

iii.

```
+---------+-----------+------+
| GNAME   | CNAME     | RATE |
+---------+-----------+------+
| Plazzo  | Cotton    |  750 |
| Suit    | Polyester | 2000 |
| Patiala | Polyester | 1850 |
+---------+-----------+------+
```

iv.

```
+------------+
| AVG(RATE) |
+------------+
| 1775.0000 |
+------------+
```

½ mark each for each correct output

27 Write a function countbb( ) in Python, which reads the contents from a text file 'article.txt' and displays number of occurrences of words 'bat' and 'ball' (in all possible cases) to the screen.

Example:

If the content of file article.txt is as follows:

Bat and ball games are field games played by two opposing teams. Action starts when the defending team throws a ball at a dedicated player of the attacking team, who tries to hit it with a bat and run between various safe areas in the field to score runs (points). The defending team can use the ball in various ways against the attacking team's players to force them off the field when they are not in safe zones, and thus prevent them from further scoring. The best known modern bat and ball games are cricket and baseball, with common roots in the 18th-century games played in England.

The countbb( ) function should display as:

Number of times bat occurs is 3

Number of times ball occurs is 5

OR

Write a function SOnly( ) in Python, which reads the contents from a text file 'news.txt' and creates another file 'modnews.txt'. New file contains only those lines that starts with an alphabet.

Example:

If the content of file news.txt is as follows:

This is Peter from California.

24th street is where I live.

__name__ is used in Python functions.

User defined functions is what I am presently reading.

Upon execution of function Sonly( ) file modnews.txt should contain:

This is Peter from California.

User defined functions is what I am presently reading.

Answer:

```
def countbb():
    fin = open('article.txt', 'r')
    data = fin.read()
    fin.close()
    L = data.split()
    bat=ball=0
    for i in L:
        i = i.rstrip(".,;-'")
        if i.upper() == 'BAT':
            bat += 1
        elif i.upper() == 'BALL':
            ball += 1
    print("Number of times bat occurs",bat)
    print("Number of times ball occurs",ball)
```

½ mark for correct function header

½ mark for correct opening of file

½ mark for correct closing of file

½ mark for correct reading of data

½ mark for correct loop and correct condition

½ mark for correct printing of output

OR

```
def SOnly():
    fin = open('news.txt','r')
    L = fin.readlines()
    fin.close()
    for i in L:
        if i[0].isalpha()==False:
            L.remove(i)
    fout = open('modnews.txt','w')
    fout.writelines(L)
    fout.close()
```

½ mark for correct function header

½ mark for correct opening of files

½ mark for correct closing of files

½ mark for correct reading of data

½ mark for correct preparation of data for second file

½ mark for correct writing data in second file

28 Consider following tables and write queries for situation a and b. Find the output of c and d:

Table: CLUB

CoachID	CoachName	Age	Sports	Dateofapp	Pay	Sex
1	KUKREJA	35	KARATE	1996-03-27	1000	M
2	RAVINA	34	KARATE	1998-01-20	1200	F
3	KARAN	34	SQUASH	1998-02-19	2000	M
4	TARUN	33	BASKETBALL	1998-01-01	1500	M
5	ZUBIN	36	SWIMMING	1998-01-12	750	M
6	KETAKI	36	SWIMMING	1998-02-24	800	F
7	ANKITA	39	SQUASH	1998-02-20	2200	F
8	ZAREEN	37	KARATE	1998-02-22	1100	F
9	KUSH	41	SWIMMING	1998-01-13	900	M
10	SHAILYA	37	BASKETBALL	1998-02-19	1700	M

Table: COACHES

Sportsperson	Sex	Coach_No
AJAY	M	1
SEEMA	F	2
VINOD	M	1
TANEJA	F	3

a. To list names of all coaches with their date of appointment in descending order.

b. To display total pay given to coaches in each sport.

c. SELECT Sportsperson, Coachname FROM Club, Coaches WHERE Coachid = Coach_no;

d. SELECT Sex, MAX(Dateofapp), MIN(Dateofapp) FROM Club GROUP BY Sex;

Answer:

a. SELECT COACHNAME, DATEOFAPP FROM CLUB ORDER BY DATEOFAPP DESC;

b. SELECT SUM(PAY) FROM CLUB GROUP BY SPORT;

c.

```
+--------------+-----------+
| Sportsperson | Coachname |
+--------------+-----------+
| AJAY         | KUKREJA   |
| VINOD        | KUKREJA   |
| SEEMA        | RAVINA    |
| TANEJA       | KARAN     |
+--------------+-----------+
```

d.

```
+------+----------------+----------------+
| sex  | MAX(Dateorapp) | MIN(Dateorapp) |
+------+----------------+----------------+
| F    | 1998-02-24     | 1998-01-20     |
| M    | 1998-02-19     | 1996-03-27     |
+------+----------------+----------------+
```

½ mark for partially correct query (a and b)

1 mark for completely correct query (a and b)

½ mark each for each correct output (c and d)

29 Write a function SumDiv(L,x), where L is a list of integers and x is an integer; passed as arguments to the function. The function returns the sum of elements of L which are divisible by x or x+1.

For example,

If L Contains [10, 27, 12, 20, 22] and x is 5

Then function returns 42 (10+12+20)

Answer:

```
def Sumdiv(L,x):
    sum = 0
    for i in L:
        if i%x==0 or i%(x+1)==0:
            sum += i
    return(sum)
```

½ mark for correct function header

½ mark for correct initialization of sum variable

½ mark for correct loop

½ mark for correct condition

½ mark for correct increment

½ mark for correct return statement

30 A nested list contains the records of Mobiles in the following format:

[[modelno, name, price], [modelno, name, price], [modelno, name, price],....]

Write the following user defined functions to perform given operations on the stack named Mobile:

a. Push operation – To push details (modelno, name, price) of those mobiles which has price lower than 10000. Make a note that there cannot be more than 20 elements in stack Mobile.
b. Pop operation – To pop elements from stack one by one and display them. Also, display "Underflow" when stack becomes empty.

For example,
If the list contains
[['V20', 'Vivo 20 SE', 18000], ['S11', 'Lava S11', 8900], ['i88', 'IPro 88 SE', 6500], ['ip13', 'iPhone 13', 125000]]
The stack should contain:
['i88', 'IPro 88 SE', 6500]
['S11', 'Lava S11', 8900]
The Output should be:
['i88', 'IPro 88 SE', 6500]
['S11', 'Lava S11', 8900]
Underflow

OR

A Dictionary Medal contains the details of schools and medals won by them in following format {school_name:medals_won}.
Write a function Push(Medal) in Python that pushes those school names in stack named SCHOOL which has won more than 3 medals. Maximum capacity of stack SCHOOL is 15. Function also shows number of items pushed in stack. If number of items exceeds 15 then it shows OVERFLOW.
For example:
If dictionary Medal contains
{'KV1':5, 'KV2':2, 'KV3':4, 'KV4':1, 'KV5':7}
Then stack should contain
KV5
KV3
KV1
The output should be:
Number of item pushed in stack Medal are 3

Answer:

```
def Push(L, mobile):
    for i in L:
        if i[2]<10000 and len(mobile)<20:
            mobile.append(i)
        elif len(mobile)>=20:
            print("OVERFLOW")
            break
def Pop(mobile):
    while len(mobile)>0:
        print(mobile.pop())
    print("Underflow")
```

½ mark for correct function headers
½ mark for correct loop and condition in Push
½ mark for correct push using append
½ mark for correct condition for Overflow
½ mark for correct pop statement and loop
½ mark for correct printing of overflow

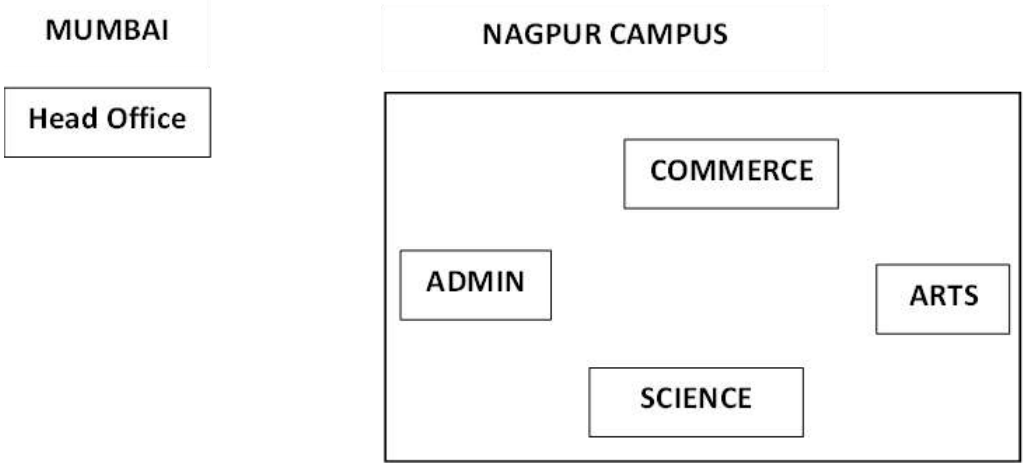
OR

```
def Push(Medal):
    x=0
    for sc in Medal:
        if Medal[sc]>3 and len(SCHOOL)<15:
            SCHOOL.append(sc)
            x+=1
        elif len(SCHOOL)>=15:
            print("OVERFLOW")
            break
    print("Number of item pushed in stack Medal are",x)
```

½ mark for correct function header
½ mark for correct loop
½ mark for correct condition
½ mark for correct append statement
½ mark for correct overflow condition
½ mark for correct printing of output

31 Superior Education Society is an educational Organization. It is planning to setup its Campus at Nagpur with its head office at Mumbai. The Nagpur Campus has 4 main buildings – ADMIN, COMMERCE, ARTS and SCIENCE.

You as a network expert have to suggest the best network related solutions for their problems raised in a to e, keeping in mind the distances between the buildings and other given parameters:



Shortest distances between various buildings:

ADMIN to COMMERCE – 55 m
ADMIN to ARTS – 90 m
ADMIN to SCIENCE – 50 m
COMERCE to ARTS – 55 m
COMMERCE to SCIENCE – 50 m

ARTS to SCIENCE - 45 m
MUMBAI Head Office to NAGPUR Campus – 850 KM
Number of Computers installed at various buildings are as follows:
ADMIN – 110
COMMERCE – 75
ARTS – 40
SCIENCE – 12
MUMBAI Head Office – 20

a. Suggest the most appropriate location of the server inside the Nagpur Campus to get the best connectivity for maximum number of computers. Justify your answer.
b. Suggest and draw the cable layout to efficiently connect various buildings within the Nagpur campus for connecting the computers.
c. Which of the following will you suggest to establish the online face-to-face communication between the people in the ADMIN office of Nagpur Campus and Mumbai Head office?
   i. Cable TV
   ii. E-mail
   iii. Video Conferencing
   iv. Text Chat
d. Suggest the placement of following devices with appropriate reasons:
   i. Switch/Hub
   ii. Repeater
e. Suggest the device/software to be installed in Nagpur Campus to take care of data security and unauthorized access.

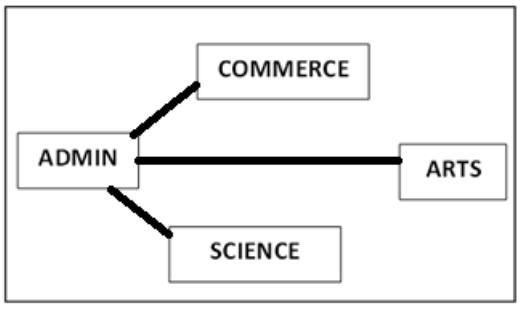
Answer:

a. The most suitable building to house the server is ADMIN building because it has maximum number of computers and as per 80:20 rule this building will have the maximum amount of network traffic.

½ mark for correct answer

½ mark for correct justification

NAGPUR CAMPUS



b.

1 mark for correct diagram

c. iii. Video Conferencing

1 mark for correct diagram

d.

i. **Switch/Hub will be placed in every building to provide network connectivity to all devices inside the building.**

ii. Repeater will not be required as there is not cable running for more than 100 meters.

½ mark each for each correct reason

e. The device/software that can be installed for data security and to protect unauthorized access is Firewall.

1 mark for correct answer

32 a. Write the output of the Code given below:

```
x = 15
def add(p=2, q=5):
    global x
    x = p+q+p*q
    print(x,end='@')
m = 20
n = 5
add(m,n)
add(q=10, p = -3)
```

b. The code given below inserts the following record in table Garment:

GCode – integer
GName – string
Rate – decimal
Qty – integer
CCode = integer

Write missing Statements (Statement 1, Statement 2 and Statement 3) to complete the code:

```
import mysql.connector as mycon
cn = mycon.connect(host='localhost', user='test', password='None', database='cloth')
cur = _____                    #Statement 1
while True:
    GCode = int(input("Enter Garment Code = "))
    GName = input("Enter Garment Name = ")
    Rate = float(input("Enter Rate = "))
    Qty = int(input("Enter Quantity = "))
    CCode = int(input("Enter Cloth Code = "))
    q = "insert into Garment Values ({}, '{}', {}, {}, {}".format(GCode, GName,
    Rate, Qty, CCode)
    cur._____(q)               #Staatement 2
    _____                      #Statement 3
    ans = input("Do you have more records (Y/N)=")
    if ans.upper()=='N':
        break
print("Records Successfully Saved")
cn.close()
```

OR

a. Write the output of the Code given below:

```
def Timing(T, m=0):
    print("Present Time is",end=':')
```

```
    if m>10 and m<=20:
        print("Quarter Past",T)
    elif m<=40:
        print("Half Past",T)
    elif m<=59:
        print("Quarter to",T+1)
    else:
        print("Incorrect Minutes")
Timing(5,18)
Timing(11)
Timing(12,60)
```

b. The code given below reads those records from table Garment which has Qty less than 50. Records in table Garments are stored with following attributes:

GCode – integer
GName – string
Rate – decimal
Qty – integer
CCode = integer

Write missing Statements (Statement 1, Statement 2 and Statement 3) to complete the code:

```
import mysql.connector as mycon
cn = mycon.connect(host='localhost', user='test', password='None', database='cloth')
cur = _____                    #Statement 1
cur._____                      #Staatement 2 (Create & Execute Query)
G = _____                      #Statement 3 Read complete result of query
print("Required records are:")
for i in G:
    print(i)
cn.close()
```

Answer:

a. 125@-23@

1 mark each for each correct output

b. Statement 1: cur = cn.cursor()
Statement 2: cur.execute(q)
Statement 3: cn.commit()
1 mark each for each correct answer

OR

a. Present Time is:Quarter Past 5
Present Time is:Half Past 11
Present Time is:Incorrect Minutes
½ mark for 1 correct output
1 mark for 2 correct outputs
2 marks for all correct outputs

b. Statement 1: cn.cursor()
Statement 2: cur.execute("Select * from Garment where Qty<50")
Statement 3: cur.fetchall()
1 mark each for each correct answer

33 What is the difference between CSV file and Text File? Write a program in Python that defines and calls the following functions:

Insert( ) – To accept details of clock from the user and stores it in a csv file 'watch.csv'. Each record of clock contains following fields – ClockID, ClockName, YearofManf, Price. Function takes details of all clocks and stores them in file in one go.

Delete( ) – To accept a ClockID and removes the record with given ClockID from the file 'watch.csv'. If ClockID not found then it should show a relevant message. Before removing the record it should print the record getting removed.

OR

Give one advantage of using CSV file over Binary file. Write a program in Python that defines and calls the following functions:

saving( ) – To accepts details of equipments from the user in following format (ID, Name, Make, Price) and save it in a csv file 'parts.csv'. Function saves one record at a time.

search( ) – To accept two prices and displays details of those equipments which has price between these two values.

Answer:

Text files are plain text files which are used to store any kind of text which has no fixed format. whereas, CSV files are also text files but they can store information in a specific format only.

```
def Insert():
    L=[]
    while True:
        ClockID = input("Enter Clock ID = ")
        ClockName = input("Enter Clock Name = ")
        YearofManf = int(input("Enter Year of Manufacture = "))
        price = float(input("Enter Price = "))
        R = [ClockID, ClockName, YearofManf, price]
        L.append(R)
        ans = input("Do you want to enter more records (Y/N)=")
        if ans.upper()=='N':
            break
    import csv
    fout = open('watch.csv','a',newline='')
    W = csv.writer(fout)
    W.writerows(L)
    fout.close()
    print("Records successfully saved")
def Delete():
    ClockID = input("Enter Clock ID to be removed = ")
    found = False
    import csv
    fin = open('watch.csv','r')
    R = csv.reader(fin)
    L = list(R)
```

```
    fin.close()
    for i in L:
        if i[0] == ClockID:
            found=True
            print("Record to be removed is:")
            print(i)
            L.remove(i)
            break
    if found==False:
        print("Record not found")
    else:
        fout = open('watch.csv','w',newline='')
        W = csv.writer(fout)
        W.writerows(L)
        fout.close()
        print("Record Successfully Removed")

while True:
    print("1. Add Clock Details")
    print("2. Remove Clock Details")
    print("3. Exit")
    ch = int(input("Enter your choice(1-3)="))
    if ch==1:
        Insert()
    elif ch==2:
        Delete()
    elif ch==3:
        print("Thanks for using this program")
        break
    else:
        print("Incorrect Choice. Please re-enter")
```

1 mark for correct difference between csv and text files.

Insert() function

½ mark for correct data input and making list

½ mark for correctly opening file

½ mark for correctly writing record

Delete() function

½ mark for correctly copying data in list

½ mark for correctly identifying record and removing it from the list

½ mark for correctly showing not found message

½ mark for correctly re-writing remaining records

Main

½ mark for correct main program

OR

CSV files stores records in text format that can be read and manipulated by other spreadsheet software like excel. However, binary files stores records in raw format and can only be read and managed by programs only.

```
def saving():
    L=[]
    ID = input("Enter ID = ")
    name = input("Enter Name = ")
    Make = input("Enter Make = ")
    price = int(input("Enter Price = "))
    R = [ID, name, Make, price]
    L.append(R)
    import csv
    fout = open('parts.csv','a',newline='')
    W = csv.writer(fout)
    W.writerows(L)
    fout.close()
    print("Record successfully saved")
def search():
    price1 = int(input("Enter Starting Price Range = "))
    price2 = int(input("Enter Ending Price Range = "))
    found = False
    import csv
    fin = open('watch.csv','r')
    R = csv.reader(fin)
    L = list(R)
    fin.close()
    for i in L:
        if int(i[3])>=price1 and int(i[3])<=price2:
            found=True
            print(i)
    if found==False:
        print("Record not found")

while True:
    print("1. Add Equipment Details")
    print("2. Search Equipments based on Price Range")
    print("3. Exit")
    ch = int(input("Enter your choice(1-3)="))
    if ch==1:
        saving()
    elif ch==2:
        search()
    elif ch==3:
        print("Thanks for using this program")
        break
    else:
```

print("Incorrect Choice. Please re-enter")

1 mark for correct advantage of CSV file.

saving() function

½ mark for correct data input and making list

½ mark for correctly opening file

½ mark for correctly writing record

search() function

½ mark for correctly copying data in list

½ mark for correctly identifying record

½ mark for correctly displaying record

½ mark for correctly showing not found message

Main

½ mark for correct main program

34 Mayanti just started to work for a sports academy having several branches across India. The sports academy appoints various trainers to train various sports. She has been given the task to maintain the data of the trainers. She has made a table called TRAINERS in the database which has following records:

Table: TRAINER

TrainerNo	Name	City	HireDate	Salary
101	SUNAINA	MUMBAI	1998-10-15	90000
102	ANAMIKA	DELHI	1994-12-24	80000
103	DEEPTI	CHANDIGARH	2001-12-21	82000
104	MEENAKSHI	DELHI	2002-12-25	78000
105	RICHA	MUMBAI	1996-01-12	95000
106	MANIPRABHA	CHENNAI	2001-12-12	69000

Based on the data given above answer the following questions:

a. Can City be used as Primary key for table TRAINER? Justify your answer.

b. What is the degree and cardinality of the table TRAINER? If we add two rows and remove three rows from table TRAINER. Also if we add another attribute in the table, what will be the degree and cardinality of the table TRAINER will become?

c. Write statements for:

iii. Insert a new record in table TRAINER with values, TrainerNo = 107, Name = Swastik, HireDate = 1999-01-22, Salary = 90000.

iv. Increase the salary of those Trainer having city as DELHI by 5000.

OR

c. Write Statements for:

iii. Removes those records from table TRAINER who were hired after year 2000.

iv. Add a new column Grade with datatype as Varchar and maximum size as 2.

Answer:

a. No. City cannot be used as Primary key for table TRAINER because it has duplicate values in it.

½ mark for correct identification

½ mark for correct justification

b. Before Changes: Degree = 5, Cardinality = 6

After Changes: Degree = 6, Cardinality = 5

½ mark for correct Degree and Cardinality before changes

½ mark for correct Degree and Cardinality after changes

c.

i. INSERT INTO Trainer (TrainerNo, Name, HireDate, Salary) VALUES (107, 'Swastik', '1999-01-22', 90000);

ii. UPDATE Trainer SET Salary = Salary + 5000 WHERE City = 'DELHI';

OR

i. DELETE FROM Trainer WHERE Year(HireDate)>2000;

ii. ALTER TABLE Trainer ADD (Grade Varchar(2));

1 mark each for each correct query

½ mark each for partially correct query

35 Tarun Nair is working under XYZ Incorporation which deals with exporting of goods to foreign countries. To keep track of inventory he is creating a Python program to store the information of item number and quantity in a binary file inventory.dat. For that he has written the following code. Go through the code given and solve problems given below:

```
def write(ino,qty):
    F = open(_____)                #Mark 2
    L= _____                       #Mark 3
    L.append([ino,qty])
    F.close()
    F=open('inventory.dat','wb')
    pickle.dump(L,F)
    F.close()

def Receive(ino,qty):
    F=open("inventory.dat","rb")
    L=pickle.load(F)
    F.close()
    for i in range(len(L)):
        if L[i][0] == ino:
            L[i][1] += qty
    F=open("inventory.dat",'wb')
    pickle.dump(L,F)
    _____                          #Mark 4

def Sent(ino,qty):
    with open("inventory.dat","rb") as F:
        L=pickle.load(F)
        for i in range(len(L)):
            if L[i][0] == ino:
                L[i][1] -= qty
    with open("inventory.dat",'wb') as F:
        pickle.dump(L,F)
```

a. Write statement to open the file at Mark 2 to read records from the file.
b. Write statement at Mark 3 to read the content of binary file in list L.
c. Write statement at Mark 4 to close the file.
d. Why there is no need to close the file in function Sent( )?

Answer:

a. F=open('inventory.dat','rb)
b. L=pickle.load(F)
c. F.close()
d. In function Sent() file is opened using with statement which implicitly closes the file and hence there is no need to separately close the file.

1 mark each for each correct answer

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Class: XII Session: 2022-23Computer Science (083)

(Theory)

Maximum Marks: 70 Time Allowed: 3 hours

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
8. All programming questions are to be answered using Python Language only.

SECTION A		
1.	Python loops can also have else caluse(True/False)	1
2.	Which of the following is not a keyword? a) eval b) assert c) nonlocal d) pass	1
3	What will be the output of the following code snippet ? rec={"Name":"Python","Age":"20","Addr":"NJ","Country":"USA"} id1=id(rec) del rec rec={"Name":"Python","Age":"20","Addr":"NJ","Country":"USA"} id2=id(rec) print(id1==id2) a) True b) False c)1 d) Exception	1
4	What is the output of this code? >>>int("3"+"4") a) "7" b)"34" c) 34 d) 24	1
5	Select the correct output of the code x="apple,pear,peach" y=x.split(" , ") for z in y: print(z) a) apple,pear,peach b) pear,apple,peach c) peach,apple,pear d) Error	1
6	To read the next line of the file from a file object infi,we use a) infi.read(all) b)infi.read() c)infi.readline() d) infi.readlines()	1
7	Fill in the Blank: _____is not a legal constraint for a CREATE TABLE command ? a) Primary Key b) Foreign Key c) Unique d) Distinct	1
8	In SQL, Which commamd(s) is(are) used to change a table's structure/characteristic ? a) ATLER TABLE b) MODIFY TABLE c) CHANGE TABLE d) ALL OF THESE	1

9	Which of the following statement(s) would give error after executing the following code?
	s1='must' #statement 1
	s2='try' #statement 2
	n1=10 #statement 3
		1

	n2=3 #statement 4 print(s2*s1) #statement 5 print(s1+s2) #statement 6 print(s1+n1) #statement 7 a) statement 4 b) statement 5 and 7 c) statement 6 d) No Error	
10	Fill in the blanks DML Stand for_____ a) Different Mode Level b) Data Model Language c) Data Mode Lane d) Data Manipulation Language	1
11.	Which of the following command is used to open a file "c:\pat.txt" for writing in binary format only? a) fout=open("c:\pat.txt","w") b) fout=open("c:\\pat.txt","wb") c) fout=open("c:\pat.txt","w+") d) fout=open("c:\\pat.txt","wb+")	1
12.	All aggregate function except_____ignore null values in their output collection a) count(attribute) b) count(*) c) avg() d) sum()	1
13.	_____Network device that regenerates and retransmit the whole signal a) Modem b) Hub c) Repeater d) Bridge	1
14.	What will be the value of the following expression ? 14+13%15 a) 14 b) 27 c) 12 d) 0	1
15.	The sum(), if used in a condition, is used with caluse a) Group By b) With c) Where d) Having	1
16.	Which function is used to open a connection with MYSQL database from within Python using mysql.connector package a) open() b) database() c) connect() d) connectdb()	1
Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True		
17.	Assertion (A):- the most common reason of an errors in python program is when a certain statement is not in accordance with the prescribed usage . such an error is	1

	called an syntax errors.. Reasoning (R):- Error caused by not following the proper structure of the language is called syntax error.	
18.	Assertion (A): CSV stands for Comma Separated Values Reason (R): CSV file are common file format for transferring and storing data.	1
	SECTION B	

19.	Mr Rathi has written code in Python to calculate fee according to condition. His code is having errors. Rewrite the correct and underline the correction made.
	def calculate():
	fee=200
	0=i
	while fee=<2000:
	if fee<=750:
	print(fee)
	fee=+250
	else:
	print("fee"*i)
	i=i+1
	fee=Fee+250
		2

20.	Write two points of difference between Twisted Pair Cables and Coaxial Cables OR Write two points of difference between SMTP and POP3	2
21.	a) Given is a Python string declaration: cbseexam="BoardExamination2022-23" Write the output of:print(cbseexam[::3]) b) Write the output of the following code dc1={ } dc1[1]=1 dc['1']=2 dc1[1.0]=4 sum=0 for k in dc1: sum+=dc1[k] print(sum)	2
22.	Explain the use of constraints in Relational Database Management System. Give Example to support your answer	2
23	a) Write the full form of the following (i) NFS (ii) FTP b) What is Modem ? What is its function ?	2
24	Predict the output of the following code given below: def func(message,num=1): print(message*num) func('Python') func('Easy',3) OR Predict the output of the following code given below: tuple1=('Jayesh','Ramya','Taruna','Suraj') list1=list(tuple1)	2

```
for Name in list1:
    if Name[0]=='T':
        break
    else:
        print("Finished")
print("Got it!")
```

25 Differentiate between CHAR and VARCHAR datatypes — 2

OR

Categorized the following command as TCL and DDL
ALTER,COMMIT,DROP,ROLLBACK

SECTION C

26. a) Consider the table Hotel given below — 1+2

EMPID	CATEGORY	SALARY
E101	MANAGER	60000
E102	EXECUTIVE	65000
E103	CLERK	40000
E104	MANAGER	62000
E105	EXECUTIVE	50000
E106	CLERK	35000

What will be output of the following statement

Select category,avg(salary) from hotel group by category

b) Write the output of the queries (i) to (iv) based on the table

TABLE-ACTIVITY

ACODE	ACTIVITYNAME	PARTICIPANTS NUM	PRIZEMONEY	SCHEDULEDATE
1001	Relay Name	16	10000	23-Jan-2004
1002	High Jump	10	12000	12-Dec-2003
1003	Shot Put	12	8000	14-Feb-2004
1005	Long Jump	12	9000	01-Jan-2004
1008	Discuss Throw	10	15000	19-Mar-2004

(i) Select * from activity where prizemoney>=9000;
(ii) Select distinct participantnum from activity;
(iii) Select count(*) from activity;
(iv) Select activityname,prizemoney from activity where scheduledate between 12-dec-2003 to 30-Jan-2004;

27. Write a method in Python to read lines from a text file DIARY.TXT and display those lines which start with the alphabet 'P' — 3

OR

Consider a Binary file Employee.dat containing details such as empno:ename:salary(separator ':'). Write a Python function to display details of those employees who are earning between 20000 and 40000(both values inclusive)

28. a) Write the outputs of the SQL queries (i) to (iv) based on the relations DEPT and WORKER — 3

TABLE-DEPT

DCODE	DEPARTMENT	CITY
D01	MEDIA	DELHI
D02	MARKETING	DELHI
D03	INFRASTRUCTURE	MUMBAI
D05	FINANCE	KOLKATA
D04	HUMAN RESOURCE	MUMBAI

TABLE-WORKER

WNO	NAME	DOJ	DOB	GENDER	DCODE
1001	GEORGE K	2013-09-02	1991-09-01	MALE	D01
1002	RYMA SEN	2012-12-11	1990-12-15	FEMALE	D03
1003	MOHITESH	2013-02-03	1987-09-04	MALE	D05
1007	ANIL JHA	2014-01-17	1984-10-19	MALE	D04
1004	MANILA SAHAI	2012-12-09	1986-11-14	FEMALE	D01
1005	R SAHAY	2013-11-18	1987-03-31	MALE	D02
1006	JAYA PRIYA	2014-06-09	1985-06-23	FEMALE	D05

i) SELECT COUNT(*),DCODE FROM WORKER GROUP BY DCODE HAVING COUNT(*)>1;

ii) SELECT DISTINCT DEPARTMENT FROM DEPT;

iii) SELECT NAME,DEPARTMENT,CITY FROM WORKER W,DEPT D WHERE W.DCODE=D.DCODE AND WNO<1003;

iv) SELECT MAX(DOJ),MIN(DOB) FROM WORKER

b) write the SQL command to display all database files.

29. Write a function even(L), where L is the list of element passed as argument to the function. The function return another list named changelist that stores even numbers. — 3

Sample List:[1,2,3,4,5,6,7,8,9]

Expected Result:[2,4,6,8]

30. Write a function in Python, MakePush(Package) and MakePop(Package) to add a new Package and delete a Package from a List of Package Description, considering them to act as push and pop operations of the Stack data structure. — 3

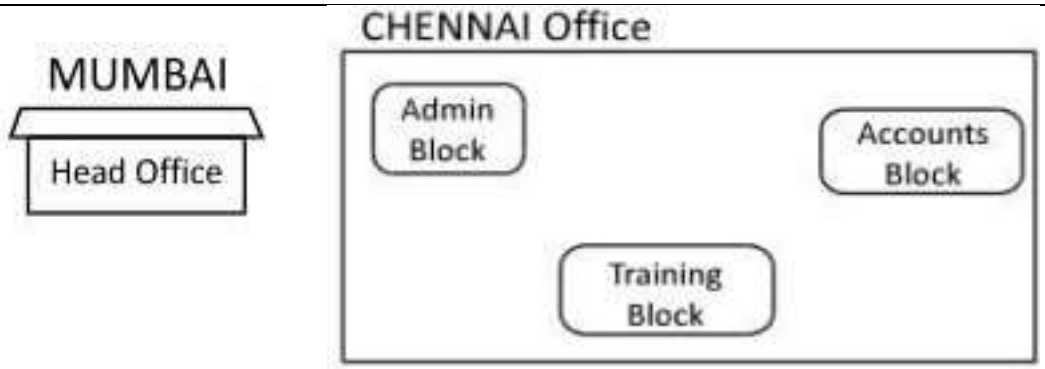
OR

Write a function in Python, Push(Client) where , Client is a dictionary containing the details of clients– {Cname:age}. The function should push the names of those client in the stack who have age greater than 50. Also display the count of elements pushed into the stack. For example: If the dictionary contains the following data: Cname={"Robert":55,"Jhon":35,"Smith":75,"Reyan":25} The stack should contain Robert Smith The output should be: The count of elements in the stack is 2

SECTION D

31. Hi Standard Tech Training Ltd. is a Mumbai based organization which is expanding its office set-up to Chennai. At Chennai office compound, they are planning to have 3 different blocks for Admin, Training and Accounts related activities. Each block has a number of computers, which are required to be connected in a network for communication, data and resource sharing. — 5

As a network consultant, you have to suggest the best network related solutions for them for issues/problems raised by them in (i) to (v), as per the distances between various blocks/locations and other given Parameters



Shortest distances between various blocks/locations:

Admin Block to Accounts Block 300 Metres

Accounts Block to Training Block 150 Metres

Admin Block to Training Block 200 Metres

MUMBAI Head Office to CHENNAI Office 1300 Km

Number of Computers-

Training Block=150

Admin Block=50

i) Suggest the most appropriate place for the server in the Chennai Office to get the best effective connectivity. Justify your answer

ii) Suggest the best wired medium for connection of computers in the Chennai office

iii) Draw the cable layout(block to block) to efficiently connect various blocks with Chennai office

iv) Suggest a device /software and its placement that would provide data security for the entire network of the Chennai office

v) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smartphones /laptop users in the Chennai office

32 a). Write the output of the code given below: 2+3

```
a=10
y=5
def myfunc():
    global a
    y=a
    a=2
    print("y=",y, "a=",a)
    print("a+y=",a+y)
    return a+y
```

print(“y=”,y,”a=”,a)
print(myfunc())
print(“y=”,y, “a=”,a)

(b) The code given below inserts the following record in the table Books:
Title – String
AuthorName – string
ISBN_No – String
Price – integer
Note the following to establish connectivity between Python and MYSQL:

- Username is root
- Password is tiger
- The table exists in a MYSQL database named Library.
- The details (Title, AuthorName, ISBN_No and Price) are to be accepted from the user. Write the following missing statements to complete the code:

Statement 1 – to form the cursor object
Statement 2 – to execute the command that inserts the record in the table Student.
Statement 3- to add the record permanently in the database

```
import mysql.connector as mysql
def Library_data():
        con1=mysql.connect(host="localhost",user="root",password="tiger",
        database="Library")
        mycursor=_____ #Statement 1
        Title=input("Enter Book Title :: ")
        AuthorName=input("Enter Book Author Name :: ")
        ISBN_No=input("Enter Book ISBN Number:: ")
        Price=int(input("Enter Price of Book :: "))
       querry="insert into Books values({},'{}',{},{})".format(Title,AuthorName ,
         ISBN_No,Price)
       _____ #Statement 2
       _____ # Statement 3
      print("Data Added successfully")
```

OR

(a) Predict the output of the following code

```
def test(s):
    k=len(s)
    m=” “
    for i in range(0,k):
            if(s[i].isupper()):
                m=m+s[i].lower()
            elif s[i].isalpha():
                m=m+s[i].upper()
            else:
                m=m+’bb’
     print(m)
```

test('school2@com')

b) The code given below reads the following record from the table named Books and displays only those records who have Price greater than 200:

Title – String

AuthorName – string

ISBN_No – String

Price – integer

Note the following to establish connectivity between Python and MYSQL:

- Username is root
- Password is tiger
- The table exists in a MYSQL database named Library.

Write the following missing statements to complete the code:

Statement 1 – to form the cursor object

Statement 2 – to execute the query that extracts records of those books whose price are greater than 200.

Statement 3- to read the complete result of the query (records whose price are greater than 200) into the object named data, from the table books in the database

```
import mysql.connector as mysql
def sql_data():
    con1=mysql.connect(host="localhost",user="root",password="tiger",
    database="library")
     mycursor=_________________ #Statement 1
     print("Books with Price greater than 200 are : ")
      _____________________________ #Statement 2
     data=____________________ #Statement 3
     for i in data:
         print(i)
     print()
```

33. What is the advantage of using a csv file for permanent storage? Write a Program in Python that defines and calls the following user defined functions:

(i) ADD() – To accept and add data of an employee to a CSV file 'record.csv'. Each record consists of a list with field elements as empid, name and mobile to store employee id, employee name and employee salary respectively.

(ii) (ii) COUNTR() – To count the number of records present in the CSV file named 'record.csv'.

OR

Give any one point of difference between a binary file and a csv file. Write a Program in Python that defines and calls the following user defined functions:

(i) add() – To accept and add data of an employee to a CSV file 'furdata.csv'. Each record consists of a list with field elements as fid, fname and fprice to store furniture id, furniture name and furniture price respectively.

(ii) (ii) search()- To display the records of the furniture whose price is more than 10000.

SECTION E

34. Given the following tables for a database LIBRARY 1+1+2

TABLE-BOOKS

Book_id	Book_name	Author_name	Publishers	Price	Type	Qty
C0001	Fast Cook	Lata Kapoor	EPB	355	Cookery	5
F0001	The Tears	William Hopkins	First Publ	650	Fiction	20
T0001	My First C++	Brain & Brooke	EPB	350	Text	10
T0002	C++Brainwork	A.W.Rossaine	TDH	350	Text	15
F0002	Thunderbolts	Anna Roberts	First Publ	750	Fiction	50

TABLE-ISSUED

Book_id	Quantity_Issued
T0001	4
C0001	5
F0001	2

i) To Show Book name,Author name and Price of books of First Publ Publishers
ii) To display the names and price from books in ascending order of their price,
iii) Write the statement to

a) To insert a new row in the table issued having the following data:'F0003",1
b) To increase the price of all books of EPB Publishers by 50

OR

iii) Write the statement to

a) Delete the record of books having price 350
b) Add a column REMARK in the table with datatype as varchar with 50 characters

35.	Aaruni Shah is learning to work with Binary files in Python using a process known as pickling/de-pickling. Her teacher has given her the following incomplete code which is creating a binary file namely Mydata.dat and then opens, reads and displays the content of this created file import_____ # Fill_Line1 sqlist=list() for k in range(10): sqlist.append(k*k) fout=_____ #Fill_Line 2 _____ #Fill_Line 3 fout.close() fin=_____ #Fill_Line 4 _____ #Fill_Line 5 fin.close() (a) Complete Fill_Line1 so that the required library becomes available to the program (b) Complete Fill_Line 2 so the above mentioned binary file is opened for writing in the file object fout (c) Complete Fill_Line 3 so that list created in nthe code , namely Sqlist, is written in the open file. (d) Complete Fill_Line 4 which will open the same binary file for reading in the file object fin. (e) Complete Fill_Line 5 so that the contents of the open file in the file handle fin are read in a list namely mylist.	5

Class: XII Session: 2022-23Computer Science (083)

(Theory)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

9. This question paper contains five sections, Section A to E.
10. All questions are compulsory.
11. Section A have 18 questions carrying 01 mark each.
12. Section B has 07 Very Short Answer type questions carrying 02 marks each.
13. Section C has 05 Short Answer type questions carrying 03 marks each.
14. Section D has 03 Long Answer type questions carrying 05 marks each.
15. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
16. All programming questions are to be answered using Python Language only.

SECTION A		
1.	Python loops can also have else caluse(True/False)	1
Ans	True	
2.	Which of the following is not a keyword? b) eval b) assert c) nonlocal d) pass	1
Ans	Eval	
3	What will be the output of the following code snippet ? rec={"Name":"Python","Age":"20","Addr":"NJ","Country":"USA"} id1=id(rec) del rec rec={"Name":"Python","Age":"20","Addr":"NJ","Country":"USA"} id2=id(rec) print(id1==id2) b) True b) False c)1 d) Exception	1
Ans	True	
4	What is the output of this code? >>>int("3"+"4") b) "7" b)"34" c) 34 d) 24	1
Ans	34	
5	Select the correct output of the code x="apple,pear,peach" y=x.split(" , ") for z in y: print(z) e) apple,pear,peach f) pear,apple,peach g) peach,apple,pear h) Error	1
Ans	apple,pear,peach	
6	To read the next line of the file from a file object infi,we use b) infi.read(all) b)infi.read() c)infi.readline() d) infi.readlines()	1

Ans	infi.readline()	
7	Fill in the Blank: _____is not a legal constraint for a CREATE TABLE command ? b) Primary Key b) Foreign Key c) Unique d) Distinct	1
Ans	Distinct	
8	In SQL, Which commamd(s) is(are) used to change a table's structure/characteristic ? e) ATLER TABLE f) MODIFY TABLE g) CHANGE TABLE h) ALL OF THESE	1
Ans	ALTER TABLE	

9	Which of the following statement(s) would give error after executing the following code?
	s1='must' #statement 1
	s2='try' #statement 2
	n1=10 #statement 3
	n2=3 #statement 4
	print(s2*s1) #statement 5
	print(s1+s2) #statement 6
	print(s1+n1) #statement 7
	e) statement 4
	f) statement 5 and 7
	g) statement 6
	h) No Error
		1

Ans	Statement 5 and 7	
10	Fill in the blanks DML Stand for_____ e) Different Mode Level f) Data Model Language g) Data Mode Lane h) Data Manipulation Language	1
Ans	Data manipulation Language	
11.	Which of the following command is used to open a file "c:\pat.txt" for writing in binary format only? e) fout=open("c:\pat.txt","w") f) fout=open("c:\\pat.txt","wb") g) fout=open("c:\pat.txt","w+") h) fout=open("c:\\pat.txt","wb+")	1
Ans	fout=open("c:\\pat.txt","wb")	
12.	All aggregate function except_____ignore null values in their output collection e) count(attribute) f) count(*) g) avg() h) sum()	1
Ans	count(attribute)	
13.	_____Network device that regenerates and retransmit the whole signal e) Modem f) Hub g) Repeater	1

	h) Bridge	
Ans	Repeater	
14.	What will be the value of the following expression ? 14+13%15 b) 14 b) 27 c) 12 d) 0	1
Ans	27	
15.	The sum(), if used in a condition, is used with caluse e) Group By f) With g) Where h) Having	1
Ans	Having	
16.	Which function is used to open a connection with MYSQL database from within Python using mysql.connector package e) open() f) database() g) connect() h) connectdb()	1
Ans	connect()	
Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True		
17.	Assertion (A):- The Maximum set of attributes that can uniquely identify a tuple is known as candidate key. Reasoning (R):- Out of one or more candidate keys, the attribute chosen by database designer to uniquely identify the tuple ina relation is called primary key of that relation.	
ANS	OPTION D IS CORRECT	
18.	Assertion (A): CSV stands for Comma Separated Values Reason (R): CSV file are common file format for transferring and storing data.	
ANS	OPTION B IS CORRECT	
	SECTION B	

19.	Mr Rathi has written code in Python to calculate fee according to condition. His code is having errors. Rewrite the correct and underline the correction made.
	def calculate():
	fee=200
	0=i
	while fee=<2000:
	if fee<=750:
	print(fee)
	fee=+250
	else:
	print(“fee”*i)
	i=i+1
	fee=Fee+250
		2

Ans	def calculate():
	fee=200
	i=0
	while fee<=2000:	

	if fee<=750:
	print(fee)
	fee+=250
	else:
	print("fee"*i)
	i=i+1
	fee=fee+250	

20.	Write two points of difference between Twisted Pair Cables and Coaxial Cables OR Write two points of difference between SMTP and POP3	2
Ans	Twisted Pair Cables- These cables consists of two insulated copper wires twisted around each other. These are used for short and medium range telephone communication. Coaxial Cables- A coaxial cable consists of one or more small cables in a protective covering. These are more expensive than twisted pair cables but perform better. OR Simple Mail Transfer Protocol (SMTP) is the standard protocol for sending emails across the internet. POP3- Post office Protocol version 3(POP3) is a standard mail protocol used to receive emails from a remote server to local email client. POP3 allows you to download email message on your local computer and read them even when you are offline	
21.	a) Given is a Python string declaration: cbseexam="BoardExamination2022-23" Write the output of:print(cbseexam[::3]) b) Write the output of the following code dc1={ } dc1[1]=1 dc['1']=2 dc1[1.0]=4 sum=0 for k in dc1: sum+=dc1[k] print(sum)	2
Ans	a) Bor b) 6	
22.	Explain the use of constraints in Relational Database Management System. Give Example to support your answer	2
23	a) Write the full form of the following (ii) NFS (ii) FTP b) What is Modem ? What is its function ?	2
Ans	i) Network File System ii) File Transfer Protocol b) A modem is a computer peripheral that connects a workstation to other work stations via telephone lines and facilitates communications Modem converts digital signals to A/F(Audio Frequency) tones which are in the frequency range that the telephone lines can transmit and also it can convert transmitted tones back to digital information	
24	Predict the output of the following code given below: def func(message,num=1): print(message*num)	2

func('Python')
func('Easy',3)

OR

Predict the output of the following code given below:

```
tuple1=('Jayesh','Ramya','Taruna','Suraj')
list1=list(tuple1)
for Name in list1:
    if Name[0]=='T':
        break
    else:
        print("Finished")
print("Got it!")
```

Ans

Python
EasyEasyEasy
OR

Finished
Finished
Got it!

25 Differentiate between CHAR and VARCHAR datatypes — 2

OR

Categorized the following command as TCL and DDL
ALTER,COMMIT,DROP,ROLLBACK

Ans The difference between CHAR and VARCHAR is that of fixed length and variable length. The CHAR datatype specifies a fixed length character string. When a column is given CHAR(n), then MySql ensures that all values stored in that column have this length i.e. n bytes. If a value is shorter than this length n then blanks are added, byt the size of value remains n bytes

OR

TCL-ROLLBACK,COMMIT
DDL-ALTER,DROP

SECTION C

26. a) Consider the table Hotel given below — 1+2

EMPID	CATEGORY	SALARY
E101	MANAGER	60000
E102	EXECUTIVE	65000
E103	CLERK	40000
E104	MANAGER	62000
E105	EXECUTIVE	50000
E106	CLERK	35000

What will be output of the following statement

Select category,avg(salary) from hotel group by category

b) Write the output of the queries (i) to (iv) based on the table

TABLE-ACTIVITY

ACODE	ACTIVITYNAME	PARTICIPANTNUM	PRIZEMONEY	SCHEDULEDATE
1001	Relay Name	16	10000	23-Jan-2004

1002	High Jump	10	12000	12-Dec-2003	
1003	Shot Put	12	8000	14-Feb-2004	
1005	Long Jump	12	9000	01-Jan-2004	
1008	Discuss Throw	10	15000	19-Mar-2004	

(v) Select * from activity where prizemoney>=9000;
(vi) Select distinct participantnum from activity;
(vii) Select count(*) from activity;
(viii) Select activityname,prizemoney from activity where scheduledate between 12-dec-2003 to 30-Jan-2004;

Ans.a

CATEGORY	SALARY
MANAGER	61000
EXECUTIVE	57500
CLERK	37500

Ans b

27. Write a method in Python to read lines from a text file DIARY.TXT and display those lines which start with the alphabet 'P' — 3

OR

Consider a Binary file Employee.dat containing details such as empno:ename:salary(separator ':'). Write a Python function to display details of those employees who are earning between 20000 and 40000(both values inclusive)

Ans

```
def display():
    file=open('DIARY.TXT','r')
    line=file.readline()
    while line:
        if line[0]=='P':
            print(line)
        line=file.readline()
    file.close()
```

OR

```
def Readline():
    i=open("Employee.dat","rb+")
    x=i.readline()
    while(x):
        l=x.split(':')
        if ((float(l[2])>=20000) and (float(l[2])<=40000):
            print(x)
        x=i.readline()
```

28. a) Write the outputs of the SQL queries (i) to (iv) based on the relations DEPT and WORKER — 3

TABLE-DEPT

DCODE	DEPARTMENT	CITY
D01	MEDIA	DELHI
D02	MARKETING	DELHI
D03	INFRASTRUCTURE	MUMBAI
D05	FINANCE	KOLKATA
D04	HUMAN RESOURCE	MUMBAI

TABLE-WORKER

WNO	NAME	DOJ	DOB	GENDER	DCODE
1001	GEORGE K	2013-09-02	1991-09-01	MALE	D01
1002	RYMA SEN	2012-12-11	1990-12-15	FEMALE	D03
1003	MOHITESH	2013-02-03	1987-09-04	MALE	D05
1007	ANIL JHA	2014-01-17	1984-10-19	MALE	D04
1004	MANILA SAHAI	2012-12-09	1986-11-14	FEMALE	D01
1005	R SAHAY	2013-11-18	1987-03-31	MALE	D02
1006	JAYA PRIYA	2014-06-09	1985-06-23	FEMALE	D05

v) SELECT COUNT(*),DCODE FROM WORKER GROUP BY DCODE HAVING COUNT(*)>1;

vi) SELECT DISTINCT DEPARTMENT FROM DEPT;

vii) SELECT NAME,DEPARTMENT,CITY FROM WORKER W,DEPT D WHERE W.DCODE=D.DCODE AND WNO<1003;

viii) SELECT MAX(DOJ),MIN(DOB) FROM WORKER

b) write the SQL command to display all database files.

Ans

i) Count(*) DCODE
2 D01
2 D05

ii) MEDIA
MARKETING
INFRASTRUCTURE
FINANCE
HUMAN RESOURCE

iii) NAME DEPARTMENT CITY
GEROGE K MEDIA DELHI
RYAM SEN INFRASTRUCTURE MUMBAI

iv) MAX(DOJ) MIN(DOB)
2014-06-09 1984-10-19

c) Show databases;

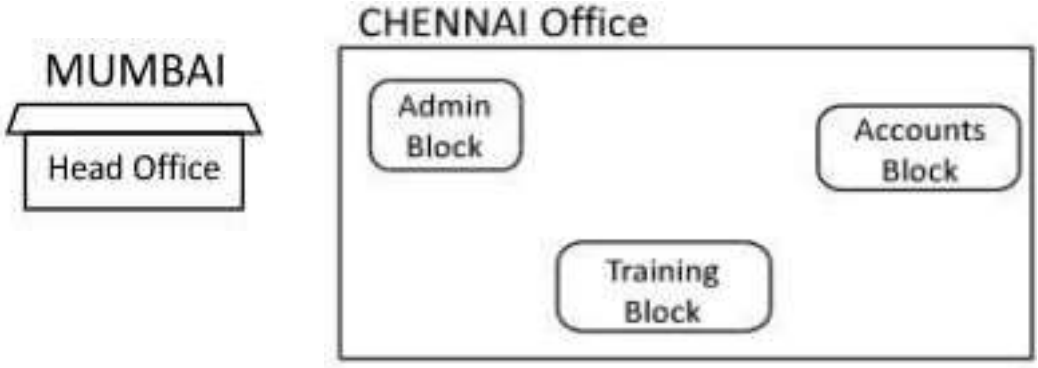
29. Write a function even(L), where L is the list of element passed as argument to the function. The function return another list named changelist that stores even numbers. Sample List:[1,2,3,4,5,6,7,8,9] Expected Result:[2,4,6,8] — 3

Ans

```
def even(l):
    changelist=[]
    for n in l:
        if n %2==0:
            changelist.append(n)
    return changelist
print(even([1,2,3,4,5,6,7,8,9]))
```

30.	Write a function in Python, MakePush(Package) and MakePop(Package) to add a new Package and delete a Package from a List of Package Description, considering them to act as push and pop operations of the Stack data structure. OR Write a function in Python, Push(Client) where , Client is a dictionary containing the details of clients- {Cname:age}. The function should push the names of those client in the stack who have age greater than 50. Also display the count of elements pushed into the stack. For example: If the dictionary contains the following data: Cname={"Robert":55,"Jhon":35,"Smith":75,"Reyan":25} The stack should contain Robert Smith The output should be: The count of elements in the stack is 2	3

Ans	def MakePush(Package):
	a=int(input("Enter Package Title"))
	Package.append(a)
	def MakePop(package):
	if(Package==[]):
	print("Stack empty")
	else:
	print("Deleted element:",Package.pop())
	OR	

	SECTION D	
31.	Hi Standard Tech Training Ltd. is a Mumbai based organization which is expanding its office set-up to Chennai. At Chennai office compound, they are planning to have 3 different blocks for Admin, Training and Accounts related activities. Each block has a number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultant, you have to suggest the best network related solutions for them for issues/problems raised by them in (i) to (v), as per the distances between various blocks/locations and other given Parameters  Shortest distances between various blocks/locations: Admin Block to Accounts Block 300 Metres Accounts Block to Training Block 150 Metres Admin Block to Training Block 200 Metres MUMBAI Head Office to CHENNAI Office 1300 Km	5

	Number of Computers- Training Block=150 Admin Block=50 vi) Suggest the most appropriate place for the server in the Chennai Office to get the best effective connectivity. Justify your answer vii) Suggest the best wired medium for connection of computers in the Chennai office viii) Draw the cable layout(block to block) to efficiently connect various blocks with Chennai office ix) Suggest a device /software and its placement that would provide data security for the entire network of the Chennai office x) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smartphones /laptop users in the Chennai office	
Ans.	1 mark for each correct answer	
32	a). Write the output of the code given below: a=10 y=5 def myfunc(): global a y=a a=2 print("y=",y, "a=",a) print("a+y=",a+y) return a+y print("y=",y,"a=",a) print(myfunc()) print("y=",y, "a=",a) (b) The code given below inserts the following record in the table Books: Title – String AuthorName – string ISBN_No – String Price – integer Note the following to establish connectivity between Python and MYSQL: • Username is root • Password is tiger • The table exists in a MYSQL database named Library.	2+3

	• The details (Title, AuthorName, ISBN_No and Price) are to be accepted from the user. Write the following missing statements to complete the code:
	Statement 1 – to form the cursor object
	Statement 2 – to execute the command that inserts the record in the table Student.
	Statement 3- to add the record permanently in the database
	import mysql.connector as mysql
	def Library_data():
	con1=mysql.connect(host="localhost",user="root",password="tiger",
	database="Library")
	mycursor=_____ #Statement 1
	Title=input("Enter Book Title :: ")
	AuthorName=input("Enter Book Author Name :: ")
	ISBN_No=input("Enter Book ISBN Number:: ")
	Price=int(input("Enter Price of Book :: "))
	querry="insert into Books values({},'{}',{},{})".format(Title,AuthorName ,
	ISBN_No,Price)
	_____ #Statement 2
	_____ # Statement 3
	print("Data Added successfully")
	OR
	
	(b) Predict the output of the following code
	def test(s):
	k=len(s)
	m=" "
	for i in range(0,k):
	if(s[i].isupper()):
	m=m+s[i].lower()
	elif s[i].isalpha():
	m=m+s[i].upper()
	else:
	m=m+'bb'
	print(m)
	test('school2@com')
	b) The code given below reads the following record from the table named Books and displays only those records who have Price greater than 200:
	Title – String
	AuthorName – string
	ISBN_No – String
	Price – integer
	Note the following to establish connectivity between Python and MYSQL:
	• Username is root
	• Password is tiger
	• The table exists in a MYSQL database named Library.
	Write the following missing statements to complete the code:
	Statement 1 – to form the cursor object	

	Statement 2 – to execute the query that extracts records of those books whose price are greater than 200.
	Statement 3- to read the complete result of the query (records whose price are greater than 200) into the object named data, from the table books in the database
	
	import mysql.connector as mysql
	def sql_data():
	con1=mysql.connect(host="localhost",user="root",password="tiger",
	database="library")
	mycursor=_____ #Statement 1
	print("Books with Price greater than 200 are : ")
	_____ #Statement 2
	data=_____ #Statement 3
	for i in data:
	print(i)
	print()	

Ans	a)y= 5 a= 10 y= 10 a= 2 a+y= 12 12 y= 5 a= 2 b) Statement 1: con1.cursor() Statement 2: mycursor.execute(querry) Statement 3: con1.commit() OR a) SCHOOLbbbbCOM b) Statement 1: con1.cursor() Statement 2: mycursor.execute("select * from books where Price>=200") Statement 3: mycursor.fetchall()	
33.	What is the advantage of using a csv file for permanent storage? Write a Program in Python that defines and calls the following user defined functions: (iii) ADD() – To accept and add data of an employee to a CSV file 'record.csv'. Each record consists of a list with field elements as empid, name and mobile to store employee id, employee name and employee salary respectively. (iv) (ii) COUNTR() – To count the number of records present in the CSV file named 'record.csv'. OR	

	Give any one point of difference between a binary file and a csv file. Write a Program in Python that defines and calls the following user defined functions: (iii) add() – To accept and add data of an employee to a CSV file 'furdata.csv'. Each record consists of a list with field elements as fid, fname and fprice to store furniture id, furniture name and furniture price respectively. (iv) (ii) search()- To display the records of the furniture whose price is more than 10000.	
Ans	Difference between binary file and csv file: (Any one difference may be given) Binary file: • Extension is .dat • Not human readable • Stores data in the form of 0s and 1s CSV file: • Extension is .csv • Human readable • Stores data like a text file Program: import csv def add(): fout=open("furdata.csv","a",newline='\n') wr=csv.writer(fout) fid=int(input("Enter Furniture Id :: ")) fname=input("Enter Furniture name :: ") fprice=int(input("Enter price :: ")) FD=[fid,fname,fprice] wr.writerow(FD) fout.close()	

```
def search():
    fin=open("furdata.csv","r",newline='\n')
    data=csv.reader(fin)
    found=False
    print("The Details are")
   for i in data:
   if int(i[2])>10000:
        found=True
        print(i[0],i[1],i[2])
   if found==False:
        print("Record not found")
fin.close()
add()
print("Now displaying")
search()
```

SECTION E

34. Given the following tables for a database LIBRARY — 1+1+2

TABLE-BOOKS

Book_id	Book_name	Author_name	Publishers	Price	Type	Qty
C0001	Fast Cook	Lata Kapoor	EPB	355	Cookery	5
F0001	The Tears	William Hopkins	First Publ	650	Fiction	20
T0001	My First C++	Brain & Brooke	EPB	350	Text	10
T0002	C++Brainwork	A.W.Rossaine	TDH	350	Text	15
F0002	Thunderbolts	Anna Roberts	First Publ	750	Fiction	50

TABLE-ISSUED

	<table><tr><th>Book_id</th><th>Quantity_Issued</th></tr><tr><td>T0001</td><td>4</td></tr><tr><td>C0001</td><td>5</td></tr><tr><td>F0001</td><td>2</td></tr></table> iv) To Show Book name,Author name and Price of books of First Publ Publishers v) To display the names and price from books in ascending order of their price, vi) Write the statement to c) To insert a new row in the table issued having the following data:'F0003",1 d) To increase the price of all books of EPB Publishers by 50 OR iii) Write the statement to c) Delete the record of books having price 350 d) Add a column REMARK in the table with datatype as varchar with 50 characters	
Ans-	i) Select Book_Name,Author_Name,Price from Books where Publishers="First Publ"; ii) Select Book_name,Price from Books order by Price iii) a) insert into issued values('F0003',1); b)update Books set Price=Price+50 where Publishers="EPB"; OR iii) a) delete from books where Price=350; b) Alter table Books add REMARK varchar(50);	
35.	Aaruni Shah is learning to work with Binary files in Python using a process known as pickling/de-pickling. Her teacher has given her the following incomplete code which is creating a binary file namely Mydata.dat and then opens, reads and displays the content of this created file import_____ # Fill_Line1 sqlist=list() for k in range(10): sqlist.append(k*k) fout=_____ #Fill_Line 2	5

	_____ #Fill_Line 3 fout.close() fin=_____ #Fill_Line 4 _____ #Fill_Line 5 fin.close() (f) Complete Fill_Line1 so that the required library becomes available to the program (g) Complete Fill_Line 2 so the above mentioned binary file is opened for writing in the file object fout (h) Complete Fill_Line 3 so that list created in nthe code , namely Sqlist, is written in the open file. (i) Complete Fill_Line 4 which will open the same binary file for reading in the file object fin. (j) Complete Fill_Line 5 so that the contents of the open file in the file handle fin are read in a list namely mylist.	
Ans	a) import pickle b) fout=open(“Mydata.dat”,’wb’) c) pickle.dump(sqlist,fout) d) fin=open(‘Mydata.dat’,’rb’) e) mylist=pickle.load(fin)	

KENDRIYA VIDYALAYA SANGATHAN - MUMBAI REGION

Sample Question Paper (2022-2023)

Class: XII | Time: 3 Hours

Subject: Computer Science (083) | Max. Marks: 70

General Instructions:

10. This question paper contains five sections, Section A to E.
11. All questions are compulsory.
12. Section A has 18 questions carrying 1 mark each.
13. Section B has 7 very short answer type questions carrying 2 marks each.
14. Section C has 5 short answer type questions carrying 3 marks each.
15. Section D has 3 long answer type questions carrying 5 marks each.
16. Section E has 2 long answer type questions carrying 4 marks each.
17. Internal choices are given in few questions.
18. All programming questions are to be answered using PYTHON language only.

SECTION - A

1 Identify the name(s) from the following that cannot be used as identifiers in Python: 1

Name, for, a_123, True

Answer :

for, True

½ mark for each correct answer

2 Name the datatype for the following: 1

c. L=25,

d. T={25:"money", "money":25}

Answer :

a. Tuple

b. Dictionary

½ mark for each correct answer

3 Which is the correct way to remove an item from dictionary i.e. Tuesday 1

WEEKD={'mon':Monday', 'tue':'Tuesday', 'wed','Wednesday'}

a. Del WEEKD('Tuesday')

b. Del WEEKD['Tue']

c. del WEEKD['tue']

d. both b and c

Answer:

c. del WEEKD['tue']

1 mark for correct answer

4 Which of following expression(s) is an example of type casting 1

(a) 4.0 +float(6) (b)5.3 +6.3 (c) 5.0 +3 (d) int(3.1) +7

Answer:

(a) 4.0 + float(6) , (d) int(3.1)+7 both are example of type casting

½ mark for each correct answer

5 What will be the output of the following: 1

```
S= "python is very funny language"
print(S.split("n"))
```

Answer:

['pytho', 'is very fu', 'y la', ' ', 'guage']

½ mark for partial correct , 1 mark for fully correct

6 Which function is used to read a single line from a file ? 1

(a) Readline( ) (b) readline( ) (c) Readlines( ) (d) readfullline( )

Answer:

(b) readline( )

1 mark for correct answer

7 Fill in the blank: 1

_____Command used to remove/drop a column(attribute) from the table(relation).

e. Update b. Drop c. Alter d.Remove

Answer:

c. Alter

1 mark for correct Answer

8 Rohan created a table Company and inserted two records now he wants to change the value in **city** column and wants to put value of **city** column is 'DELHI' for both the records, write command to update the record in a table. 1

Answer:

UPDATE COMPANY SET CITY='DELHI';

1 mark for correct answer

9 What will be the output of the following code: 1

```
Color = 'Color helps to give shadow to the picture'
newcolor = Color.replace('o','#')
print(newcolor)
```

Answer:

C#l#r helps t# give shad#w t# the picture

½ mark for partial change of 'o' , 1 mark for complete correct output

10 Fill in the blank: 1

`_____ command is used to delete all the record, structure of a table must exist in database after deleting all the record of a table

(a) DROP (b) DELETE (c) ALTER (d) None of these

Answer: DELETE

1 mark for correct answer

11 Which of the following mode is used for both writing and reading in binary in file 1

e. wr+ b. wb+ c. w+ d. wr

Answer:

f. wb+

1 mark for correct answer

12 In database School there are two table Student (containing 5 records) and Fee (containing 3 records). Sohan displayed data from both the tables using select command, then total 15 rows (records) displayed , which type of joining is implemented when, Sohan displayed records 1

a. Equi Join b. Cross Join c. Natural Join d. none of these

Answer :

b. Cross Join

1 mark for correct answer

13 _____ protocol is used to transmit the data between devices and containing address of node also 1

a. SMTP b. PPP c. UDP d. TCP/IP

Answer:

d. TCP/IP (1 mark for correct answer)

14 What will be the output of the following expression and statement: 1

M=30>5 and 15==15

Print(M)

a. 30 b. true c. True d. False

Answer:

c. True (1 mark for correct answer)

15 Aman store 5 five in table 'student' and for attribute fee Rs. 1500,2500,3000,1000,NULL stored respectively. Aman executed the below command in SQL : 1

Select average(fee) from student;

After executing the above command for NULL fee record Rs. 4500 updated in the table student .

on the basis of above select command what will be the average of fee will come as output:

a. 1600 b. 2000 c. 2500 d. None of the above

Answer:

b. 2000
1 mark for correct answer

16 To establish a connection between python and mysql which package is required to import in python programming : 1

a. Python.mysql.connector b. Mysql.Connector
c. mySql.connector d. mysql.connector

Answer : d. mysql.connector
1 mark for correct answer

Questions 17 and 18 are ASSERTION (A) and REASONING (R) based questions. Mark the correct choice as

e. Both A and R are true and R is the correct explanation of A.
f. Both A and R are true and R is not the correct explanation of A.
g. A is true but R is false.
h. A is false but R is true.

17 Assertion (A): If you don't provide value to argument of function during function call then the function take its default value defined in the function. 1
Reason (R): during functions call argument are required

Answer

a. Both A and R are true and R is the correct explanation of A.

1 mark for correct answer

18 Assertion (A): In CSV , reader module take file object as argument 1
Reason (R): Default value of newline is '\n' in open() statement used with csv file.

Answer

a. Both A and R are true and R is the correct explanation of A.

1 mark for correct answer

SECTION - B

19 Rewrite the following code in Python after removing all syntax error(s). Underline each correction done in the code: 2

```
Value=30
Def Display(Value):                                    #
Function Define
        for VAL in range(0,Value)
                if(val%4==0):
                        print(VAL*4)
                elif(VAL%5==0):
                        Print(VAL+3)
                Else:
                        print(VAL+10)
Display(30)                                            #
Function call
```

Answer:

```
Value=30
def Display(Value):                                                    #
Function Define
        for VAL in range(0,Value):
                if(VAL%4==0):
                        print(VAL*4)
                elif(VAL%5==0):
                        print(VAL+3)
                else:
                        print(VAL+10)
Display(30)                                                            #
Function call
```

½ mark for each correction , 2 marks all correction and proper syntax

20 Differentiate between Viruses and Worms in context of Networking and Data Communication threats. 2

Answer:

Viruses require an active host program or an already infected and active operating system in order for viruses to run, cause damage and infect other executable files or documents. **Worms are** standalone malicious programs that can **self-replicate.**

2 marks for difference

OR

Write is difference between web browser and web server. Write name any two web browsers.

Answer:

Web browser: A web browser is a software application for accessing information from the World Wide Web. When a user requests a web page from a particular website, the browser retrieves the necessary content from a web server and then displays the page on the user's device

Web Server: A web server is used to run all websites. The main objective of web server is to store, process and deliver web pages to the user.

The intercommunication is done using Hypertext Transfer Protocol

Popular web browsers : Google Chrome, Microsoft Edge, Mozilla Firefox

1 mark for difference and 1 mark for writing correct web browsers name

21 Find and write the output of the following python code: 2

```
def Display(str):
    m=" "
    for i in range(0,len(str)):
            if (str[i].isupper()):
                    m=m+str[i].lower()
```

```
            elif (str[i].islower( )):
                    m=m+str[i].upper( )
            else:
                    m=m+str[i-1]
    print(m)
Display('Fun@Python3.7.0')
```

Answer:

fUNnpYTHONn3.7.

2 marks for correct output

22 Define Candidate key with suitable example. 2

Answer:

A table may have more than one such attribute/ group of attributes that identifies a tuple uniquely, all such attribute(s) are known as Candidates key

Example : TABLE : ITEMS

INO	ITEM	PRICE
P101	PEN	250
P102	PENCIL	302
C103	CD	205
E104	ERASER	250
D105	DUSTER	105

In the above table ITEMS, (INO,ITEM uniquely identified all tuples can be a candidate key

1 mark for defining and 1 marks for correct example

23 c. Write the full form of FTP and HTTP? 1

swer:

P :- FILE TRANSFER PROTOCOL

'TP:- HYPER TEXT TRANSFER PROTOCOL

mark each for correct expand

d. Expand CDMA and WLL

swer: 1

)MA : CODE DIVISION MULTIPLE ACCESS

.L : WIRELESS LOCAL LOOP

mark each for correct expand

24 Predict the output of the python code given below: 2

```
def Difference(N1,N2):
        if (N1>N2):
                return (N1+N2)
        else:
                return (N2+N1)
Value=['a','B','c','D','e','F']
```

```
for ch in range(5,0,-1):
        A=Value[ch]
        B=Value[ch-1]
        print(Difference(A,B))
```

Answer :

eF
eD
cD
cB
aB
1 mark for partial output and 2 marks for complete output

OR

Predict the output of the python code given below:

```
T=25,26,27,28,29
L=list(T)

NL=[ ]
for I in L:
        if(i%2==0):
                NL.append(i)
        else:
                NL.append(i-1)
NP=tuple(NL)
print(NP)
```

Answer :

(25,26,26,28,28)
2 marks for correct output

25 Mohan facing problem to apply SQL functions help him as per below circumstances and **suggest correct function <u>with column name if any as per given statement</u>:-**

e. Want to count total number of record of a table(relation) ½
f. Want to find the average of fees received in the vidyalaya ½
g. Want to count for a column city how many city entered in the column(attribute) except null values ½
h. Want to find the maximum fee paid by a student in the Vidyalaya ½

Answer:

a. Count(*) b. avg(fee) c. Count(city) d. Max(fee)
½ mark for each correct answer

OR

Categorize the following commands as DDL or DML:
CREATE, DELETE, ALTER, UPDATE 2

Answer:

DDL : CREATE , ALTER
DML: DELETE, UPDATE
½ mark each for categorizing the command, total 2 marks

SECTION - C

26 Consider the following tables and answer the questions a and b:

Table: School

SID	SName	Fee	Class	CCode
S101	JATIN	2000	11	C1101
S102	PARTH	1500	11	C1102
S103	SNEHA	1800	12	C1202
S104	PRADEEP	2750	11	C1101
S105	ABHINAV	2400	12	C1201

Table: TEACHER

CCode	TName
C1101	PRAMOD
C1102	SMARAT

c. What will be output of the following command: 1

SELECT * FROM SCHOOL NATURAL JOIN TEACHER;

d. What will be the output of following commands:

v. SELECT DISTINCT CLASS FROM SCHOOL; ½

vi. SELECT CCODE, SUM(FEE) FROM SCHOOL GROUP BY CCODE HAVING COUNT(*)>1; ½

vii. SELECT SNAME, TNAME, FROM SCHOOL S, TEACHER T WHERE S.CCODE = T.CCODE AND FEE>2000; ½

viii. SELECT AVG(FEE) AS AVGFEE FROM SCHOOL WHERE FEE BETWEEN 1500 AND 1800; ½

Answer:

a. SELECT * FROM SCHOOL NATURAL JOIN TEACHER;

SID	SName	Fee	Class	CCode	TNAME
S101	JATIN	2000	11	C1101	PRAMOD
S102	PARTH	1500	11	C1102	SMARAT
S104	PRADEEP	2750	11	C1101	PRAMOD

b(i).

SID
S101
S102

b(ii)

CCODE	FEE
C1101	4750
C1102	1500
C1202	1800

C1201	2400

b(iii)

SNAME	TNAME
PRADEEP	PRAMOD

b(iv)

AVGFEE
1650

3 marks for correct output of sub parts of a (1 mark) , b(I to iv) (½ mark each)

27 Write a function **displayMyMe()** in python that counts the number of "Me" or "My" words present in the text file "STORY.TXT". 3

If the "STORY.TXT" contents are as follows:

My first book
was **Me** and **My** Family. It
gave **Me** chance to known to the world.

The output of the function should be

Count of My/Me in file : 4

Answer:

```
def displayMyMe():
    num=0
    f=open("STORY.txt,'r')
    N=f.read()
    M=N.split()
    for X in M:
        if (X=="Me" or "My"):
            num=num+1
     f.close()
     print("Count of My/Me in file : ", num)
```

½ mark for defining correct function with colon(:)
½ mark for opening file correctly, ½ mark for read()
½ mark for split() , ½ marks for if condition ,
½ mark for print statement

OR

Write a function vowelcount( ) in Python , which should read each character of a text file POEM.txt, should count and display the occurrence of vowels (including both cases)

Example

If the file content is as follows :
You are good student of class

Total Vowels : 10

Answer:

```
def vowelcount():
```

```
f=open("POEM.txt,'r')      # r mode if not mention then it default take read mode
vowel=['a','e','i','o','u','A','E','I','O','U']
count=0
data=f.read()
for i in data:
    if i  in vowel:
        count=count+1
print(" Total Vowels : ",count)
f.close()
```

½ mark for defining correct function with colon(:)
1 mark for opening file correctly, ½ mark for read() if data read correctly
½ marks for if condition to check vowel, ½ mark for print statement

28 Consider the relations(tables) Games and Player and write the output of the query for a (i) to (iv) (½ mark each= 2 marks) ,(b) write the command as per statement

Table: **GAMES**

GCode	GName	Number	Gametype	Prize	Sdate
G101	Carom	2	Indoor	15000	2022-07-02
G102	Badminton	2	Outdoor	12000	2021-09-15
G103	Table Tennis	4	Indoor	8000	2022-07-25
G104	Chess	2	Indoor	7000	2020-10-01
G105	Lawn Tennis	4	Outdoor	20000	2022-11-01

Table: **PLAYER**

PCODE	PNAME	GCode
P1	PRAMOD	G101
P2	SMARAT	G102
P3	DIPAK	G103
P4	NILESH	G105

½
½

(a) Write the output of all statements (Queries)

e. SELECT Gametype, avg(Prize) from GAMES group by Gametype;

f. SELECT max(Sdate), min (Sdate) from GAMES;

g. SELECT Gname, Gametype, G.GCode, , Pname FROM Games G, Player P WHERE G.GCode=P.GCode and Prize>10000; ½

h. SELECT Gname, Pname from Games G, Player P where Number>=4 and G.GCode=P.GCode; ½

(b) **Write a Query** to insert a record in to table GAMES : 1

GCode	GName	Number	Gametype	Prize	Sdate
G106	Chess	2	Indoor	12000	2022-10-11

Answer : a (i to iv) ½ mark for output , b: 1 mark for correct query

a(i)

Gametype	Avg(Prize)

Indoor	10000
Outdoor	16000

(ii)

Max(Sdate)	Min(Sdate)
2022-11-01	2020-10-01

(iii)

Gname	Gametype	GCode	Pname
Carom	Indoor	G101	PRAMOD
Badminton	Outdoor	G102	SMARAT
Lawn Tennis	Outdoor	G105	NILESH

(iv)

Gname	Pname
Table Tennis	DIPAK
Lawn Tennis	NILESH

b.

INSERT into Games values('G106','Chess', 2, 'Indoor', 12000, '2022-10-11');

29 Write a function **LShift(Arr,n)** in Python, which accepts a list **Arr** of numbers and **n** is a numeric value by which all elements of the list are shifted to left. 3

Sample Input date of the list

Arr=[10,20,30,40,12,11] , n=2

Output

Arr=[30,40,12,11,10,20]

Answer :

```
def LShift(Arr,n):
    L=len(Arr)
    for x in range(0,n):
        y=Arr[0]
        for i in range(0,L-1):
            Arr[i]=Arr[i+1]
            Arr[L-1]=y
      print(Arr)
```

½ mark for defining function correctly ,½ marks for len()
1 mark for implementing range() ,
1 mark for proper executing with proper indentation of print statement

30 Write a function in Python Push(student) , where student is a list containing student's name . In Push(student) function , it will insert student record having student name in the stack. 3

ANSWER:

```
student=[]
def Push(student):
    stud_name=input(" enter the name of student")
   S=[stud_name]
   Student.append(S)
   print("student record added into the stack")
```

or any correct program
½ mark of declaration of list , ½ mark for defining correct function,
1 mark for inputting name , 1 mark for append record in stack list

OR

Write a function in Python Pop(student) , where student is a stack implemented by a list of student name . The function returns the value deleted from the stack.
student list containing student record

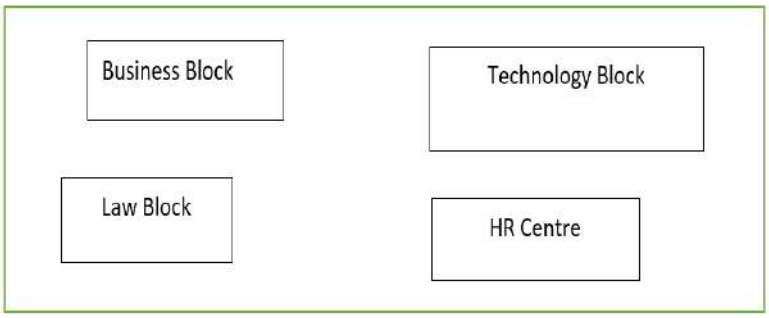
ANSWER:

```
def Pop(student):
    if (student==[]):
        print("stack is empty")
    else:
       n=student.pop()
       print(n, "student record deleted from the stack")
```

or any correct program
1 mark for defining a function correctly, 1 mark for checking empty stack, 1 mark for pop of student from the stack

SECTION D

31 Three student of KV started a business company **Alumni University and** setting up its academic block in Mumbai and is planning to set up of a network. The University has 3 academic block (BUSINESS, TECHNOLOGY, LAW) and one Human Resources Centre as shown in the diagram below:



Centre and blocks distances is as follows:

LAW Block to Business Block	40 m
LAW Block to Technology Block	80 m
LAW Block to HR Centre	105 m
Business Block to Technology Block	30 m
Business Block to HR Centre	35 m
Technology Block to HR Centre	15 m

Numbers of computer in each of the blocks/ Centre is as follows:

LAW Block	18
Technology Block	45
HR Center	105
Business Block	30

f. Suggest the most suitable palce (i.e. Block/ Center) to install the server of this University with a suitable reason. 1

g. Suggest an proper layout for connecting these blocks /center for wired connectivity 1

h. Which device will your suggest to be placed / installed in each of these blocks/center to efficiently connect all the computers with in these blocks/center. 1

i. Suggest the place to fix repeater in the network with justification 1

j. The university is planning to connect its admission office in all states, which is more than approx. 1000 km from University , which type of network out of LAN, MAN, WAN will be established ? Justify your answer. 1

ANSWER:

(i) Server will be installed in HR Center because of having maximum number of computer in the area

(ii) Make a layout That connect all blocks with HR center (or any proper best layout)

(iii) Switch will be installed in all blocks/center to connect all the computers in a network

(iv) Repeater may be placed when the distance between two blocks is more than 70-80 meter

(v) WAN, because the given distance is more than the range of LAN and WAN

32 c. Write the output of the Code given below: 2

```
m = 5
def product(p=2, q=5):
    global m
    m = p*q+q*p
    print(m,end='#')

a = 20
b = 5
product(a,b)
product(q=3, p = 2)
```

Answer

200#12#

1 mark for each correct output

d. The code given below used to insert the record in table Games of database STATEGAME: 3

GCode – integer
GName – string
Number – integer
Prize – integer

Write missing Statements (Statement 1, Statement 2 and Statement 3) to complete the code for executing the program in python using myconnector:

```
import mysql.connector as connection
cn = connection.connect(host='localhost', user='root', password='root',
    database='STATEGAME')
cur = _____          #Statement 1 for making a cursor
while True:
    GCode = int(input("Enter Game Code : "))
    GName = input("Enter Game Name : ")
    Number = int(input("Enter Number of Player in Game : "))
    Prize = int(input("Enter Prize money : "))
    Row = "insert into Games Values ({}, '{}', {}, {}", format(GCode,
    GName,
                Number, Prize)
    cur._____(Row)      #Staatement 2 to insert record using cursor
    _____          #Statement 3 to save record permanently
    newrow = input("Do you have more records (Y/N)=")
    if (newrow=='n' or newrow=='N'):
        break
print("Records Successfully Saved")
connection.close()
```

Answer

Statement 1: cur = connection.cursor()
Statement 2: cur.execute(row)

Statement 3: connection.commit()
1 mark each for each correct answer

33 What is the use of CSV file in Python Programming? how its helps to store data in it.? Write a program in Python that defines and call the following user define functions:- 5

add( ) – To accept and add data of an student in to a CSV file "school.csv". Each record consists of a list with field elements as **sid, sname and class** to add student id, student name and class respectively.

Count( ) – To count the number of records present in the CSV file named 'school.csv'

ANSWER

CSV file in python programming helps to store data like a text file in a format COMMA SEPERATED VALUE. The extension of CSV file is .csv , it's a Human Redable format. This file can be open in Excel and Notepad also

```
import csv
def add():
    fout=open("school.csv",'a', "newline='\n')
    wrow=csv.writer(fout)
    sid=int(input( "enter the student id"))
    sname=input("enter the student name")
    class=int(input("enter class in number in which student studying"))
    row=[sid,sname,class]
    wrow.writerow(row)
    fout.close()
def Count():
    fin=open(("school.csv",'a', "newline='\n')
    data=csv.reader(fin)
    record=list(data)
    print(len(record))
    fin.close()

add()
Count()
```

1 mark for explaining the use of CSV file, ½ mark for importing csv module
1½ mark for making add() correct storing the data and 1 ½ counting the total number of records from a CSV file
½ mark function calling

SECTION E

34 Rohan just started to work for a sports academy having several branches across India. The sports academy appoints various trainers to train various sports. She has been given the task to maintain the data of the trainers. She has made a table called TRAINERS in the database which has following records:

Table: TRAINER

TNo	TName	City	HireDate	Salary
101	SUNAINA	MUMBAI	1998-10-15	90000
102	ANAMIKA	DELHI	1994-12-24	80000
103	DEEPTI	CHANDIGARH	2001-12-21	82000
104	MEENAKSHI	DELHI	2002-12-25	78000
105	RICHA	MUMBAI	1996-01-12	95000
106	MANIPRABHA	CHENNAI	2001-12-12	69000

Based on the data given above answer the following questions:

d. Which column will be the primary key in this table justify your answer?

e. What is the degree and cardinality of the table TRAINER? If we add three rows and after that remove two rows from table TRAINER. Also if we add two another attribute in the table, what will be the degree and cardinality of the table TRAINER will become? 1 1

f. Write statements for:

v. Insert a new record in table TRAINER with values, TN = 107, TName = 'Pramod', City=' DELHI' HireDate = '1999-01-22', Salary = 90000. 1

vi. Increase the salary of those Trainer having city as DELHI by 5000. 1

OR (option for part C only)

d. Write Statements for:

v. Removes those records from table TRAINER who were hired after year 2000. 1

vi. Add a new column **Game** with datatype as Varchar and maximum size as 20. 1

Answer:

d. Tno column in the table (relation) can be declare as Primary key because of having unique value.

1 mark for correct justification or any correct justification

e. Before Changes: Degree = 5, Cardinality = 6

After Changes: Degree = 7, Cardinality = 7
½ mark for correct Degree and Cardinality before changes
½ mark for correct Degree and Cardinality after changes

f.

iii. **INSERT INTO Trainer (TNo, TName, City, HireDate, Salary) VALUES (107, 'Pramod','Delhi', '1999-01-22', 90000);**

iv. **UPDATE Trainer SET Salary = Salary + 5000 WHERE City = 'DELHI';**

OR (option for part (c) only

iii. **DELETE FROM Trainer WHERE Year(HireDate)>2000;**

iv. **ALTER TABLE Trainer ADD (Game Varchar(20));**

1 mark each for each correct query

½ mark each for partially correct query

35 SMARAT is working under KVS, which deals with student record and want to store data in to file with the information of STUDENT id and student name in a binary student.dat. student will go aboard , if id of the student will match . For that he has written the following code. Go through the code given and solve problems given below:

```
def write(id,name):
    F = open(_____)                #Statement 1
    L= _____                       # Statement 2
    L.append([id,name])
    F.close()
    F=open('inventory.dat','wb')
    pickle.dump(L,F)
    F.close()

def Receive(id,name):
    F=open("inventory.dat","rb")
    L=pickle.load(F)
    F.close()
    for i in range(len(L)):
        if L[i][0] == id:
            L[i][1] += qty
    F=open("student.dat",'wb')
    pickle.dump(L,F)
    _____                          #Statement 3

def Sent(id,name):
    with open("student.dat","rb") as F:
        L=pickle.load(F)
        for i in range(len(L)):
            if L[i][0] == id:
                L[i][1] -= name
    with open("student.dat",'wb') as F:
        pickle.dump(L,F)
```

e. Write python code to open the file at **Statement 1** to read records from the file. 1

f. Write python code at **Statement 2** to read the content of binary file in list L. 1

g. Write python code at **Statement 3** to close the file. 1

h. Why binary file is more accurate to store the data for future use? 1

Answer:

e. F=open('student.dat','rb)
f. L=pickle.load(F)
g. F.close()
h. Binary file in python store the data in machine understandable format, user can not read the data from a file. It is a portable file to transfer the data from one computer to another like a python program is also portable. In this file security of data is easily maintainable because it is not understandable for individual user.

1 mark each for each correct answer

Time :- 3:00 hr **M.M. :- 70**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q34 against part(d) only.
8. All programming questions are to be answered using Python Language only.

Section :- A

1. State True or False 1

"A list of character is similar to a string type "

2. Which of the following is not a tuple function ? 1

(a) min ( ) (b) max( ) (c) update( ) (d) count( )

3. Write the output of the following code :- 1

```
a= {'a': "Apple", 'b': "Banana" , 'c': "Cat"}
a['a']= "Anar"
print (a)
```

(a) {'a': "Apple", 'b': "Banana" , 'c': "Cat"}
(b) Error
(c) {'a': ''Apple", 'a': "Anar", 'b': "Banana" , 'c': "Cat"}
(d) None of the above

4. Carefully observe the code and give the answer :- 1

```
def functions1(a) :
    a= a+ '1'
        a=a*2
    function1 ("hello")
```

(a) Indentation Error (c) cannot perform mathematical operation on strings
(b) hello2 (d) hello2hello2

5. What will be the output of the following Python code? 1

```
i = 2
while True:
   if i%3 == 0:
      break
   print(i)
   i += 2
```

(a) 2 4 6 8 10……. (c) 2 3
(b) 2 4 (d) error

6. Fill in the blanks :- 1

" The data types whose values cannot be changed in place are called _____ types "

7. What is the difference between r+ and w+ modes ? 1

(a) No difference
(b) In r+ mode , the pointer is initially placed at the beginning of the file and for w+ the pointer is placed at the end
(c) In w+ mode , the pointer is initially placed at the beginning of the file and for r+ the pointer is placed at the end
(d) Depends on the operating system.

8. What is the value of the following expression ? 1

21//4+6/3

(a) 7 (b) 7.33 (c) 7.25 (d) 7.0

9. What will be the output of following code if a = "abcde" 1

```
a [1:1 ] == a [1:2]
type (a[1:1]) == type (a[1:2])
```

10. What kind of transmission medium is most appropriate to carry data in a computer network that is exposed to electrical interferences? 1

(a) Unshielded twisted pair (c) Microwave
(b) Coaxial cable (d) Optical Fiber

11. Which of the following keywords will you use in the following query to display all the values of the column dept_name ? 1

Select _____ dept_name from company

(a) All (b) From (c) Distinct (d) Name

12. Which operator tests column for the absence of data (i.e. NULL value) ? 1

(a) EXISTS operator (b) NOT operator (c) IS operator (d) None of these

13. Mandatory argument required to connect any database from python 1

(a) Username, Password, Hostname, Database name, Port
(b) Username, Password, Hostname
(c) Username, Password, Hostname, Database name
(d) Username, Password, Hostname, Port

14. When iterating over an object returned from csv.reader(), what is returned with each iteration? For example, given the following code block that assumes csv_reader is an object returned from csv.reader(), what would be printed to the console with each iteration? 1

```
for item in csv_reader:
  print(item)
```

(a) The row data as a list
(b) The column data as a list
(c) The full line of the file as a string
(d) The individual value data that is separated by the delimiter

15. Read the following statement about feature of CSV file and select which statement is TRUE ? 1

Statement 1: Only database can support import/export to CSV format
Statement 2: CSV file can be created and edited using any text editor
Statement 3:All the columns of CSV file can be separated by comma ' ,' only

(a) Statement 1 and Statement 2
(b) Statement 2 and Statement 3
(c) Statement 2

(d) Statement 3

16. In order to open a connection with MySQL database from within Python using mysql.connector package _____ function is used . 1

(a) open ( ) (b) database ( ) (c) connect ( ) (d) connectdb ( )

Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as

(a) Both (A) and (R) are correct and (R) is correct explanation of (A).
(b) Both (A) and (R) are correct 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.

17. Assertion (A) : Data Integrity means that data is accurate and consistent in the database. 1
Reason (R) :- Data integrity also ensures that your data is safe from any outside forces.

18. Assertion (A) : A database can have only one table 1
Reason (R) :- if a piece of data is stored in two places in the database, then storage space is wasted.

SECTION B

19. Rewrite the following code in python after removing all syntax error(s) . Underline each correction done in the code :- 2

```
def  sum(c)
s=0
for i in Range (1, c+1)
s=s+i
      return s

print(sum(5)
```

20. Write an advantage and a disadvantage of using Optical fiber cable ? 2

OR

What is the basic difference between functioning of a hub and switch when both precisely connect computers into a network?

21. What is output of following codes :-

(a)
```
s= 'My'
s1= 'Blog'
s2=s[:1] +s1[len (s1)-1:]
print (s2)
```
1

(b)
```
d= {'x':1, 'y':2, 'z':3}
a=d.pop ('y')
print (a)
print (b)
```
1

22. What is the difference between primary key and unique constraints ? 2

23. (a) Expand the following terms :- 1
(i) SMTP (ii) POP

(b) What is the uses of microwave signals? 1

24. Determine the output of the following :- 2

```
def determine (s) :
    d= {"UPPER ": 0 , "LOWER":0}
```

```
for c in s:
        if c.isupper ( ):
              d["UPPER"]+=1
        elif c.islower ( ) :
              d["LOWER"]+=1
        else:
             pass

print ("Upper case count: ", d["UPPER"])
print ("Lower case count: ", d["LOWER"])
```

determine ('These are HAPPY Times')

25. What is wrong with the following statement ? 2

```
SELECT  * FROM Employee
WHERE  grade = NULL;
```

Write the corrected form of above SQL statement .

SECTION C

26. (a) Give the output for the following SQL queries as per given table : 3

Table :- LAB

No	Itemname	CostPerItem	Quantity	DateofPurchase	Warranty	Operational
1	Computer	60000	9	21/05/1996	2	7
2	Printer	15000	3	21/05/1997	4	2
3	Scanner	18000	1	29/08/1998	3	1
4	Camera	21000	2	13/06/1996	1	2
5	Hub	8000	1	31/10/1999	2	1
6	UPS	5000	5	21/05/1996	1	4
7	Plotter	25000	2	11/01/2000	2	2

(i) SELECT MIN (DISTINCT Quantity) FROM LAB;
(ii) SELECT MIN (Warranty) FROM LAB WHERE Quantity = 2;
(iii) SELECT SUM(CostPerItem) FROM LAB WHERE Quantity =2;
(iv) SELECT AVG (CostPerItem) FROM LAB WHERE DateofPurchase < {01/01/1999}

(b) What is Equijoin ?

27. Write a function LShift (Arr, n) in Python , which accepts a list Arr of numbers and n is a numeric value by which all elements of the list are shifted to left . 3

Sample Input Data of the list
Arr = [10, 20,30,40,12,11], n=2
Output
Arr = [30,40,12,11,10,20]

28. Write a function AMCount( ) in Python ,which should read each character of a text file STORY.TXT , should count and display the occurrence of alphabets A and M (including small cases a and m also too). 3

Example :- If the file content is as follows :

Updated information
As simplified by official websites

The EUCount ( ) function should display the output as :

A or a :4
M or m :2

OR

Write a function in Python that counts the number of "Me" or "My" word present in a text file "STORY.TXT" , if the "STORY.TXT " contents are as follows :-

Mt first book
was Me and
My family .It
gave me
chance to be
known to the
world.

The output of the function should be :

Count of Me/My in file :

29. Consider the following tables PRODUCT and CLIENT . Write SQL command for the following statements: - 3

Table :- PRODUCT

P_ID	ProductName	Manufacturer	Price
TP01	Talcom Powder	LAK	45
Fw05	Face Wash	ABC	45
BS01	Bath Shop	ABC	55
SH06	Shampoo	XYZ	120
FW12	Face Wash	XYZ	95

Table :- CLIENT

C_ID	ClientName	City	P_ID
01	Cosmetic Shop	Delhi	FW05
06	Total Health	Mumbai	BS01
12	Live Life	Delhi	SH06
15	Pretty Women	Delhi	FW12
16	Dreams	Banglore	TP01

(i) To display the details of those Clients whose City is Delhi.
(ii) To display the details of Products whose Price is in the range of 50 to 100 (Both values included).
(iii) To display the ClientName, City from table Client and ProductName and Price from table Product with their corresponding matching P_ID.

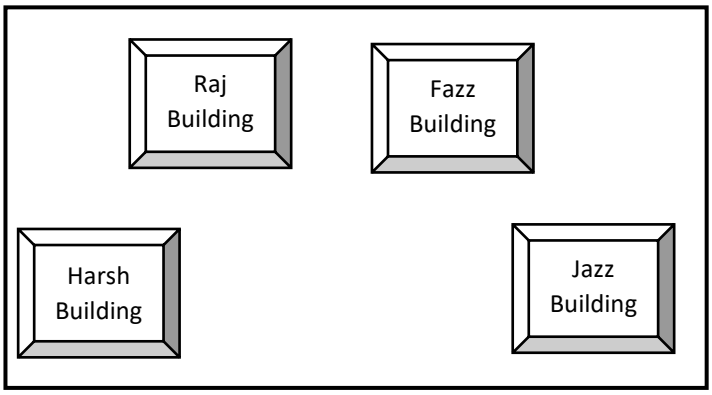
30. Write a function in Python , MakePush (Package) and MakePop (Package) to add a new package and delete a package from a List of Package Descriptions , considering them to act as push and pop operations of the Stack data structure . 3

OR

Write Addnew(Book) and Remove(Book) functions in Python to Add a new Book and Remove a Book from a List of Books , considering them to act as PUSH and POP operations of the data structure Stack .

SECTION D

31. (a) Ravya Industries has set up its new center at Kaka Nagar for its office and web based activities . The company compound has 4 buildings as shown in the diagram below : 4



Center to center distances between various building is as follows :

Harsh Building to Raj Building	50 m
Raj Building to Fazz Building	60 m
Fazz Building to Jazz Building	25 m
Jazz Building to Harsh Building	170 m
Harsh Building to Fazz Building	125 m
Raj Building to Jazz Building	90 m

Number of Computers in each of the building is as follows :-

Harsh Building	15
Raj Building	150
Fazz Building	15
Jazz Building	25

(i) Suggest a cable layout of connections between the buildings.
(ii) Suggest the most suitable place (i.e. building) to house the server of this organization with a suitable reason
(iii) Suggest the placement of the following devices with justifications:-\
(a) Internet Connecting Device /Modem (b) Switch
(iv) The organization is planning to link its sale counter situated in various parts of the same city, which type of network out of LAN, MAN or WAN will be formed? Justify you answer.

(b) Give any two example of e-wallets or Digital Wallets ? 1

32. (a) What possible output (s) are expected to be displayed on screen at the time of execution of the program from the following code ? Also specify the maximum values that can be assigned to each of the varibales Lower and Upper . 2

```
import random
AR  = [20,30,40,50,60,70];
Lower = random.randint (1,3)
Upper= random.randint (2, 4)
For K in range (Lower, Upper +1):
      print ( AR [K] , end = "# ")
```

(i) 10 #40#70 # (ii) 30#40#50# (iii) 50#60#70# (iv) 40#50#70#

(b) Differentiate between fetchone ( ) and fetchcall ( ) method with suitable example for each . 3

OR

(a) Which names are local and which are global in the following code fragment ? 2

```
invader= "Big names "
pos = 200
level=1

def play ( ):
    max_level= level+10
    print(len(invanders) == 0
    returnmax_level
res =play ( )
print (res)
```

(b) (i) What is database cursor and resultset ? 2

(ii) Name two libraries that can be used to connect with MySQL database from within a Python program . 1

33. Ranjan Kumar of class 12 is writing a program to create a CSV file "user.csv" which will contain user name and password for some entries . He has written the following code . As a programmer, help him to successfully mexecute the given task : 5

```
import _____                          # Line 1
def addCsvFile (UserName , Password ):
    f= open ('user.csv' , '_____')   # Line 2
    newFileWriter= csv.writer(f)
    newFileWriter.writerow ([UserName, PassWord ])
    f.close ()

#csv file reading code
def readCsvFile ( ):
    with open ( 'user.csv', 'r')  as newfile :
        newFileReader= csv._____ (newFile )      # Line 3
        for row in newFileReader :
            print (row [0], row [1])
    newFile ._____                    # Line 4
addCsvFile ("Arjun ", "123@456")
addCsvFile ("Arunima", "aru@nima")
addCsvFile ("Frieda ", "myname@FRD")
readCsvFile ( )                       # Line 5
```

(a) Name the module he should import in Line 1.

(b) In which mode , Ranjan should open the file to add data into the file

(c) Fill in the blank in Line 3 to read the data from a csv file.

(d) Fill in the blank in Line 4 to close the file.

(e) Write the output he will obtain while executing Line 5

SECTION E

34. A department store MyStore is considering to maintain their inventory using SQL to store the data . As a database administer , Abhay has decided that :- 4

- Name of the database - mystore
- Name of the table - STORE
- The attributes of STORE are as follows :
  ItemNo : numeric
  ItemName : Character of size 20
  Scode : numeric
  Quantity : numeric

Table :- STORE

ItemNo	ItemName	Scode	Quantity
2005	Sharpener Classic	23	60
2003	Ball Pen 0.25	22	50
2002	Get Pen Premium	21	150
2006	Get Pen Classic	21	250
2001	Eraser Small	22	220
2004	Eraser Big	22	110
2009	Ball Pen 0.5	21	180

(a) Identify the attribute best suitable to be declared as a primary key,
(b) Write the degree and cardinality of the table STORE .
(c) Insert the following data into the attribute ItemNo, ItemName and SCode respectively in the given table STORE

ItemNo =2010, ItemName = "Note Book " and Scode =25

(d) Abhay want to remove that table STORE from the database MyStore . Which command will he use from the following :

(i) DELETE FROM store; (ii) DROP TABLE store ;
(iii) DROP DATABASE mystore; (iv) DELETE store FROM mystore ;

OR

(d) Now Abhay wants to display the structure of the table STORE ,i.e. name of the attributes and their respective data types that he has used in the table . Write the query to display the same .

35. Ariba Malik has been given following incomplete code , which takes a student's details (rollnumber, name and marks) and writes into a binary file stu.dat using pickling . 4

```
import pickle
sturno = int (input ("Enter roll number:=" ))
stuname= input ("Enter name :")
stumarks= float (input ("Enter marks : "))
Stu1= {"RollNo. " : sturno , "Name " : stuname, "Marks " : stumarks }
with _____  as fh :                    # Fill_Line 1
     _____                             # Fill_Line 2
_____ as  fin :                        # Fill_Line 3
     _____                             # Fill_Line 4

     print (Rstu )
```

```
  if Rstu [“Marks”] >=85:
     print (“Eligible for merit certificate ”)
  else :
     print (“Not eligible for merit certificate ”)
```

help Ariba to computer the code as per the following instructions :-

(a) Complete Fill_Line 1 so that the mentioned binary file is opened for writing in fh object using a with statement.
(b) Complete Fill_Line 2 so that the dictionary Stu’s contents are written on the file opened in step (a)
(c) Complete Fill_Line 3 so the the earlier created binary file is opened for reading in a file object namely fin using a with statement.
(d) Complete Fill_Line 4 so that the contents of open file in fin are read into a dictionary namely Rstu.

****

Kendriya Vidyalaya Sangathan

Mumbai Region

Class XII (Session 2022-23) Subject :- Computer Science (083)

Sample Question Paper (Theory)

Marking Scheme

Time :- 3:00 hr **M.M. :- 70**

General Instructions:

9. This question paper contains five sections, Section A to E.
10. All questions are compulsory.
11. Section A have 18 questions carrying 01 mark each.
12. Section B has 07 Very Short Answer type questions carrying 02 marks each.
13. Section C has 05 Short Answer type questions carrying 03 marks each.
14. Section D has 03 Long Answer type questions carrying 05 marks each.
15. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q34 against part(d) only.
16. All programming questions are to be answered using Python Language only.

Section :- (A)

Ans 1:-	False	1
Ans 2:-	(c)	1
Ans 3:-	(a)	1
Ans 4:-	(a)	1
Ans 5:-	(b)	1
Ans 6 :-	Immutable	1
Ans 7:-	(b)	1
Ans 8:-	(d)	1
Ans 9 :-	False True	½ +½
Ans10 :-	(d)	1
Ans 11:-	(a)	1
Ans 12:-	(c)	1
Ans13 :-	(c)	1
Ans 14:-	(a)	1
Ans 15:-	(c)	1
Ans 16 :-	(c)	1
Ans 17:	(a)	1
Ans 18:-	(d)	1

SECTION (B)

Ans 19:-

```
def sum(c) :
s=0
for i in range (1, c+1):
    s=s+i
    return s

print(sum(5))
```

2 (½ +½+½ +½)

(½ mark for every correct error)

Ans 20:-

Advantage :- It is very fast and reliable — 1

Disadvantage :- It is an expensive communication medium — 1

(1 mark for advantage and 1 mark for disadvantage)

OR

A hub shares and distributes bandwidth among all connected computers whereas a switch does not share bandwidth , rather each computer gets full bandwidth.

A hub is a broadcast device while a switch is a unicast device .

(1 mark for each correct difference)

Ans 21:

(a) Mg — 1

(1 marks for correct answer)

(b) 2 — ½ +½

{'x': 1, 'z': 3}

(½ mark for every correct full form)

Ans 22:- Primary key cannot have NULL value , the unique constraints can have NULL values . There is only one primary key in a table , but there can be multiple unique constraints . The primary key creates the cluster index automatically but the Unique key does not.

(1 mark in each difference)

Ans 23 :- (a) (i) Simple Mail Transfer Protocol (ii) Post Office Protocol — 1

(½ mark for every correct full form)

(b) Microwave signals are used to transmit data without the use of cables . The microwave signals are similar to radio and television signals and are used for long distance communication. — 1

(1 mark for correct answer)

Ans 24 :- Upper case count : 7 — 1

Lower case count :11 — 1

(1 mark for each correct digit)

Ans 25 :- A relational operation "=" is not used with the NULL clause. — 1

The corrected form is

```
SELECT * FROM Employee
WHERE grade is NULL;
```

— 1

(1 mark for find wrong statement and 1 mark for correct code)

SECTION (C)

Ans 26 :- (a) (i) 1 (ii) 1 (iii) 80000 (iv) 23800 — 2

(½ mark for each)

(b) An Equijoin is a special type of join where two tables are joined on the basis of common column having equal values i.e it is based upon we use only an equality operator . The EQUI join shows the common columns from all the participating tables . 1

(1 mark for correct answer)

Ans 27 :- 3

```
def Lshift (Arr, n):
    L= Len(Arr)
    for x in range (0,n):
        y= Arr[0]
        for i in range( 0,L-1):
            Arr [i] =Arr [i+1]
        Arr [L-1]=y
    print( Arr)
```

(½ mark for correct function header , 1 mark for correct outer loop ,1 mark for correct inner loop statement , ½ mark for print statement)

Note: Any other relevant and correct code may be marked

Ans 28:- 3

```
def count_A_M( )
    f= open ("story.txt", "r")
    A,M =0,0
    r=f.read ( )
    for x in r :
        if x[0] == "A"  or x[0] == 'a' :
            A=A+1
        elif x[0]== 'M' or x[0] == 'm':
            M=M+1
    f.close ( )
    print ("A or a : ", A)
    print ("M or m : ", M)
```

OR

```
def  displayMeMy ( ) :
    num= 0
    f=open ("story.txt" , "rt")
    N= f.read ( )
    M=N.split ( )
    for x in M:
        if x== "Me" or x== "My":
            print (x)
            num =num+1
    f.close( )
    print ("Count of Me/My in file ", num)
```

- ½ mark for correctly opening and closing the file
- ½ for read()
- ½ mark for correct loop
- ½ for correct if statement
- ½ mark for correctly incrementing count
- ½ mark for displaying the correct output)

Note: Any other relevant and correct code may be marked

Ans 29:- (i) SELECT * FROM CLIENT
WHERE City = “Delhi ”;. 1

(ii) SELECT * FROM PRODUCT
WHERE Price BETWEEN 50 and 100; 1

(iii) SELECT ClientName , City , ProductName, Price
FROM CLIENT, PRODUCT
WHERE CLIENT.P_ID = PRODUCT.P_ID 1

(1 mark for each correct query)

Ans 30:- 3

```
def MakePush( Package):
    a= int (input (“Enter package title: ”))
    Package.append (a)

def MakePop (Package):
    if (Package== [ ])
        print (“Stack empty”)
    else :
        print (“Deleted element : ”, Package.pop( ))
```

OR

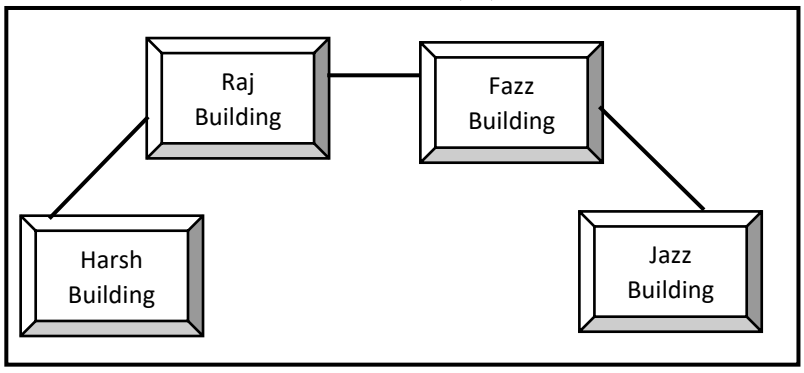
```
Book [ ]
def Addnew (s):
    Name = input (“Enter Book Name ”)
    Book.append (Name)

def Remove (self) :
    if (Book == [ ] )
        print (“Stack Empty , Underflow !! ”)
    else :
        print (“Deleted Book is : ”, Book,pop ( ))
```

(1½ marks for correct push() and 1½ marks for correct pop())

SECTION (D)

Ans 31 :- (i) 4=



1

(1 mark for the correct layout)

(ii) The most suitable place /block to house the server of this organization would be Raj Building , as this block contains the maximum number of computer , thus decreasing the cabling cost for most of the computers as well as increasing the efficiency of the maximum computers in the network. ½ +½

(½ mark for naming the server block and ½ mark for correct reason.)

(iii) (a) Raj Building since it contains largest number of computers.
(b) In the suggested layout , a hub/ switch each would be needed in all the building to interconnect the group of cables from the different computers in each block ½ +½

(½ mark each (a) and (b) for correct justification)

(iv) The type of network that shall be formed to link the sale counters situated in various parts of the same city would be a MAN, because MAN (Metropolitan Area Networks) are the networks that link computer facilities within a city. 1

(**1 mark for the correct answer)**

(b) PayTm, PhonePe, GooglePay etc ½ +½

(**(½ mark for each correct answer)**

Ans 32:- (a) (ii) 1 +½
Maximum value of Lower : 3 +½
Maximum value of upper : 4

(1 mark for correct option ans ½ marks for each correct lower and upper value answer)

(b) Fetchall ( ) fetches all the rows of a query result (the resultset). An empty list is returned if ther is no record matching as per the given SQL query.

Fetchone ( ) method retursn one row or a single reocrd at a time from the resultset. It will return None if no more rows /records are available . 3

For example , if the SQL query returned two records in the resultset such as :

101 Rushil 97.5
106 Anya 98.0

then fetchall ( ) will get all the recorsd (i.e both records shown) in one go. And fetchone ( ) will first get the fist record and after using fetchone( ) again , it will get the second record.

(1 mark for each correct answer and ½ mark for each example)

OR

(a) Global names : invaders, pos , level ,res 1
Local names : max_level 1

(1 mark for each correct answer)

(b)
(i) A database cusror is a special control structure that facilities the row by row processing of the records of the resultset .

The resultset refers to a logical set of records that are fetched from the database by executing an SQL query and made avaliable to the application program.

(1 mark for each correct definition) 1+1

(ii) mysql.connector , pymysql
(1/2 mark for each correct answer)

½ +½

Ans 33:- (a) Line 1: csv 1

(b) Line 2: a 1

(c) Line 3 : reader 1

(d) Line 4 : close ( ) 1

(e) Line 5 : Arjun123@456 1

Arunima aru@nima

Frieda myname@FRD

(1 mark each correct answer)

SECTION (E)

Ans 34:- (a) ItemNo (1 mark for correct answer) 1

(b) Degree = 4 ; Cardinality = 7 (1/2 mark for each correct answer) ½ +½

(c) INSERT INTO STORE (ItemNo, ItemName , Scode) VALUES (2010, "Note Book ", 25); 1

(1 mark for correct answer)

(d) DROP TABLE store ; (1 mark for correct answer) 1

OR

(d) Des or Describe Store (1 mark for correct answer)

Ans :- 35

```
import pickle
sturno = int (input ("Enter roll number:=" ))
stuname= input ("Enter name :")
stumarks= float (input ("Enter marks : "))
Stu1= {"RollNo. " : sturno , "Name " : stuname, "Marks " : stumarks }
```

(a) with **open ("Stu.dat", "wb")** as fh : 1

(b) **pickle. Dump (Stu1, fh)** 1

(c) **with open ("Stu.dat " , "rb")** as fin : 1

(d) **Rstu = pickle.load (fin)** 1

```
    print (Rstu )
      if Rstu ["Marks"] >=85:
        print ("Eligible for merit certificate ")
      else :
        print ("Not eligible for merit certificate ")
```

****

KENDRIYA VIDYALAYA SANGATHAN MUMBAI REGION

Sample Question Paper 2022-23

Class- XII
Computer Science (083)

Maximum Marks : 70 **Time: 3 Hrs.**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each.
8. All programming questions are to be answered using Python Language only.

	SECTION – A	
Q.No.	**QUESTIONS**	**Marks**
1.	**State True or False** **"In Python, a variable is a place holder for data"**	**1**
2.	**Which value type does input() return?** (a) **Boolean** **(b) String** **(c) int** **(d)float**	**1**
3.	**Which is the correct form of declaration of dictionary?** (a) **D={1:'M' , 2: 'T' , 3:'W'}** (b) **D= {1;'M' , 2; 'T' , 3;'W'}** (c) **D= {1:'M' 2: 'T' 3:'W' }** (d) **D= {1:'M' ; 2: 'T' ; 3:'W'}**	**1**
4.	**How would you write A^Y in Python as an expression?** (a) **A*Y** **(b) A**Y** **(c) A^Y** **(d) A^^Y**	**1**
5.	**What is the length of the tuple shown below: -** **T= (((('a',1), 'b', 'c'), 'd',2), 'e',3)**	**1**

	(a) 7 (b) 5 (c) 3 (d) 2	
6.	**The file mode to open a binary file for writing as well as reading is ----------** (a) **wb (b) wr (c) wb+ (d) wr+**	**1**
7.	**Which of the following is not a legal constraint for create table command?** **(a)primary key (b) unique (c) check (d) distinct**	**1**
8.	**Consider the following Sql statement . What type of statement is this?** **SELECT* FROM Employee;** (a) **DML (b) DDL (c) TCL (d) DCL**	**1**
9.	**Which of the following statements would give an error after executing the following code?** **T= 'green' # ---- Statement 1** **T[0]= 'G' #---- Statement 2** **T=[1 , 'B' ,14.5] #---- Statement 3** **T[3]=15 #---- Statement 4** **Options:-** (a) **Statement 2 and 4** (b) **Statement 1 and 2** (c) **Statement 3 and 4** (d) **Statement 1 and 3**	**1**
10	**Fill in the blank: -** **A---------- is a property of the entire relation , which ensures through its value that each tuple is unique in a relation.** **(a)Rows (b) key (c) Attribute (d) Field**	**1**
11	**What will be the output of the following statement in python? (fh is a file handle)** **fh.seek(-30,2)** **Options:-** **It will place the file pointer:-** **(a) at 30th byte ahead of current current file pointer position** **(b) at 30 bytes behind from end-of file**	**1**

	(c) at 30th byte from the beginning of the file **(d) at 5 bytes behind from end-of file**	
12	**Which of the following keywords will you use in the following query to display the unique values of the column dept_name?** **SELECT ---------- dept_name FROM Company;** **(a)All (b) key (c) Distinct (d) Name**	**1**
13	**The physical address assigned by NIC manufacturer is called----------address.** **(a)IP (b) MAC (c) TCP (d) URL**	**1**
14	**What will the following expression be evaluated to in Python?** **(Given values :- A=16 , B=15)** **print((14+13%15) +A%B//A)** **(a)14 (b) 27 (c) 12 (d) 0**	**1**
15	**All aggregate functions except ----------ignore null values in their input collection.** **(a)max() (b) count(*) (c) Avg() (d) sum()**	**1**
16	**After establishing database connection, database---------- is created so that the sql query may be executed through it to obtain resultset.** **(a)connector (b) connection (c) cursor (d) object**	**1**
	Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as **(a) Both A and R are true and R is the correct explanation for A** **(b) Both A and R are true and R is not the correct explanation for A** **(c) A is True but R is False** **(d) A is false but R is True**	
17	**Assertion (A):- A default argument can be skipped in the function call statement.** **Reasoning (R):- The default values for parameters are considered only if no value is provided for that parameter in the function call statement.**	**1**
18	**Assertion (A): CSV files are delimited files that store tabular data where comma delimits every value.** **Reason (R): For writing onto a CSV file , user data is written on txt.writer object which converts the user data into delimited form and writes it on to the csv file.**	**1**

	SECTION – B Each question carries 2 marks	
Q.No.	**QUESTIONS**	**Marks**
19.	**The following Python code is supposed to print the largest word in a sentence but there are few errors. Rewrite the code after removing errors and underline each corrections made.** **Str=input("Enter a sentence")** **word=split()** **print(word)** **maxlen=0** **largest=""** **for i in word:** **l=len(i)** **if(l>maxlen):** **largest=l** **print(largest)**	**2**
20.	**Write any two differences between telnet and ftp.** **Or** **Write short notes on URLs and domain names.**	**2**
21.	**1. A List is declared in Python as below** **mylist=[34,65,-77,12,0,113,31]** **Find the output of the command** **mylist[:5]** **2. Suppose a Tuple is declared as follows** **mytup=(32,93,45,71,-89,111,100)** **Guess the minimum value for K so, exception handling will print the IndexError message** **try:** **for i in range(K):** **print(mytup[i])** **except IndexError:** **print("It's out of range now so stop")**	**2**
22.	**Differentiate between primary key and foreign key.**	**2**
23.	**1. Expand the following** **a. UDP b. CDMA** **2. What is the use of Voip?**	**2**
24.	**What possible outputs are expected to be displayed on the screen at the time of execution of the program from the following code? Also specify the minimum and maximum values that can be assigned to the variable c.** **import random** **temp=[10,20,30,40,50,60]**	**2**

```
c=random.randint(0,4)
for I in range(0, c):
        print(temp[i],"#")
```

a) 10#20# **b) 10#20#30#40#50#**
c) 10#20#30# **d) 50#60#**

OR

Give output of the following:

```
def ChangeLst():
    L=[]
    L1=[]
    L2=[]
    for i in range(1,10):
            L.append(i)
    for i in range(10,1,-2):
            L1.append(i)
    for i in range(len(L1)):
            L2.append(L1[i]+L[i])
    L2.append(len(L)-len(L1)
    print(L2)
```

25. **Differentiate between DELETE and DROP table commands with example.** **2**
OR
Categorize the following commands as DDL or DML:
INSERT, DESC, ALTER, DELETE

SECTION – C

26. **(a)** **Based on the tables CAR and CUSTOMER write the output of the following query:** **1+2**

select * from Car NATURAL JOIN Customer;

Table : Car

Ccode	CarName	Make
501	A-Star	Suzuki
503	Indigo	Tata
502	Innova	Toyota
509	SX4	Suzuki
510	C Class	Mercedes
511	I-20	Tata

Table: Customer

Ccode	Address
502	Kolkata
509	Jaipur

502	Beas	

(b) Write the output of the queries (i) to (iv) based on the table, TRAVEL given below:

Table: TRAVEL

TNO	TNAME	TDATE	KM	TCODE	NOP
101	Janish	2015-02-18	100	101	32
102	Vedika	2014-06-06	65	101	45
103	Tarun	2012-10-09	32	104	42
104	John	2015-10-30	55	105	40
105	Ahmed	2015-12-15	47	101	16
106	Raveena	2016-02-26	82	103	9

1. ***Select count(distinct TCODE) from Travel;***
2. ***Select TCODE , max(NOP), count(*) from Travel group by TCODE;***
3. ***Select Tname from TRAVEL where NOP < 20 order by Tname desc;***
4. ***Select MIN(KM) from Travel where KM between 60 and 100;***

27. **Write a function countwords( ) that read a file 'python.txt' and display the total number of words which begins by uppercase character.** **3**

Example:

Suppose the file have following text:

'Python is a powerful, user friendly and platform independent Language'

Output of function should be : 2

OR

Write a python function ALCount(), which should read each character of text file "STORY.TXT" and then count and display the number of lines which begins from character 'a' and '*l*' individually (including upper cases 'A' and 'L' too)

Example:

Suppose the file content is as below:

A python is a powerful
Language is user friendly
It is platform independent Language

	Output of function should be : ***A or a: 1*** ***L or l : 1***	

28.	**(a) Write the output of SQL queries (i) to (iv) based on table SCHOOLADMIN and ROADMIN, given below:**	**3**

Table: SCHOOLADMIN

ANO	NAME	STREAM	DOB	PHONE	FEE
101	Srishti B	Business Admin	2005-05-12	12343224	2000
102	Aman	Sciences	2005-11-02	67134324	4000
103	Shivam	Sciences	2006-01-23	51134324	3500
104	Banita	Business Admin	2005-10-12	13241934	2500
105	Myra	Fine Arts	2005-07-01	12445931	1500
106	Raghav	Humanities	2005-06-05	42155931	5000
107	Medini	Fine Arts	2005-09-05	51215931	1000
108	Udai Veer	Sciences	2006-11-25	55134324	4500

Table: ROADMIN

R_NO	STREAM	PLACE
1	Sciences	Agra
2	Fine Arts	Jaipur
3	Humanities	Tinsukia

(i) ***SELECT Stream, Max(FEE) FROM SCHOOLADMIN group by stream;***

(ii) ***SELECT Max(DOB), Min(DOB) FROM SCHOOLADMIN WHERE STREAM != "Sciences";***

(iii) ***SELECT Name, Phone, R.Place, DOB FROM SCHOOLADMIN S ROADMIN R where WHERE S.Stream = R.Stream and ANO > 104;***

(iv) ***SELECT NAME, Place FROM SCHOOLADMIN S, ROADMIN R WHERE STREAM="Fine Arts" and S.Stream = R.Stream;***

(b) Write the command to view the structure of the table 'ROADMIN'

29.	**Define a function add(a , b) where a and b are lists of same length.**	**3**

	1. **If length of the lists is not equal, function should display a message 'Length not equal'** 2. **If length is equal then elements of both the lists should be added together and form a new list.** ***For example :*** ***A = [1, 2, 3, 4]*** ***B= [8,11,27, 14]*** ***C= [9, 13, 30, 18]***	

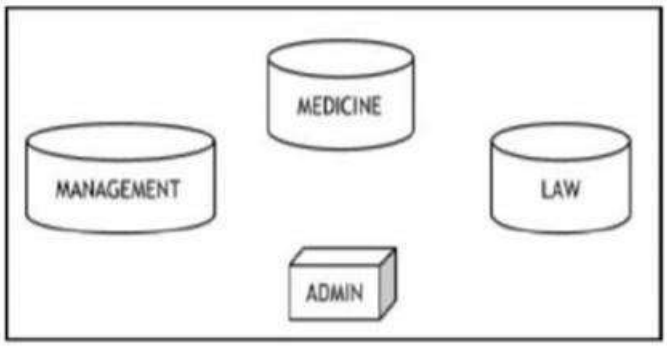
30.	**A list contains following record of a student:** **[SID, Name, Marks]** **Write the following user defined functions to perform given operations on the stack named STUD:** ***(i) Push_student(s) – To push an object containing SID and Name of student whose marks are more than 75 to the stack.*** ***(ii) Pop_student( ) – To Pop the objects from the stack and display them. Also display 'Stack empty' when there is no element in the stack.*** **OR** **Write a function Push(STUD) in python, where STUD is a dictionary containing The details of stationary items- {Sname : marks}.** **The function should push the names of those students in the stack who have marks less than 33. Also display the count of elements pushed into the stack.**	**3**

SECTION – D

31.	**Bright training institute is planning to set up its centre in Amritsar with four specialised blocks for Medicine, Management, Law courses along with an Admission block in separate buildings. The physical distance between these blocks and the number of computers to be installed in these blocks are given below. You as a network expert have to answer the queries raised by their board of directors as given in (I) to (IV)** **Shortest distance between various locations in metres** **Number of Computers installed at various locations are as follows**	**5**

Admin Block to Management Block	**60**
Admin Block to Medicine Block	**40**
Admin Block to Law Block	**60**
Management Block to Medicine Block	**50**
Management Block to Law Block	**110**
Law Block to Medicine Block	**40**

Admin Block	**150**	
Management Block	**70**	
Medicine Block	**20**	
Law Block	**50**	



(i) ***Suggest the most suitable place to install the main server of this institution to get efficient connectivity.***

(ii) ***Suggest the best wired medium and draw the best cable layout for effective network connectivity of the blocks having server with all the other blocks.***

(iii) ***Suggest the devices to be installed in each of these buildings for connecting computers installed within the building out of the following:***

- ***Modem***
- ***Switch***
- ***Gateway***
- ***Router***

(iv) ***Suggest the most suitable wired medium for efficiently connecting computers installed in every building out of the following network cables.***

- ***Coaxial cable***
- ***Ethernet cable***
- ***Single pair***
- ***Telephone cable.***

(v) ***Mr X works in the admin block and he usually connects his projector to his mobile phone for presentation purpose. Identify the type of network he creates***

- ***PAN***
- ***LAN***
- ***MAN***
- ***WAN***

32. **(a) Find and write the output of the following Python code:** **2+3**

```
def Show(str):
    m=""
    for i in range(0,len(str)):
        if(str[i].isupper()):
            m=m+str[i].lower()
        elif str[i].islower():
            m=m+str[i].upper()
```

```
            else:
                if i%2 != 0:
                    m=m+str[i-1]
                else:
                    m=m+"#"
        print(m)

    Show('CBSE kvs')
```

(b) The code given below inserts the following record in the table "Library":

BID – integer
BTitle – string
Pages – Integer
Price – Integer

Note the following to establish connectivity between Python and MySQL:

- *Username is root*
- *Password is kvs*
- *The table exists in MySQL database name LIB.*
- *The details (BID, BTitle, Pages, Price) are to be accepted from user*

Write the following missing statements to complete the code:

Statement-1 : to form the cursor object
Statement-2 : to execute the command that inserts record in table
Statement-3 : to add the record permanently in the database

```
import mysql.connector as mc
def sql_data( ):
    con1=mc.connect(host="localhost", user='root',
        password='kvs', database='LIB')
    mycur= _____                    # Statement-1
    BID=int(input('Enter book ID='))
    BTitle=input('Enter book title=')
    Pages = int(input("Enter no. of pages="))
    Price = int(input("Enter book price="))
    Qry="insert into library values ( { }, '{ }', { }, { })". format(BID,
            BTitle, Pages, Price)
    _____                           # Statement-2

    _____                           # Statement-3
    print('Data added in the table")
```

OR

(a) Find and write the output of the following python code:

```
def changer(p,q=10):
    p=p/q
    q=p%q
    print(p,'#',q)
    return p
a=200
b=20
a=changer(a,b)
print(a,'$',b)
b=changer(b)
print(a,'$',b)
```

(b) **The code given below reads the following record from the table "Library" and display only those records who have price less than 500:**

BID – integer
BTitle – string
Pages – Integer
Price – Integer

Note the following to establish connectivity between Python and MySQL:

- **Username is root**
- **Password is kvs**
- **The table exists in MySQL database name LIB.**

Write the following missing statements to complete the code:

Statement-1 : to form the cursor object
Statement-2 : to execute the query that extracts records of those books whose Price is less than 500
Statement-3 : to read the complete result of the query into the object data, from the table Library in the database.

```
import mysql.connector as mc
def sql_data( ):
    con1=mc.connect(host="localhost", user='root',
          password='kvs', database='LIB')
    mycur= _____                    # Statement-1
    print("Books with price less than 500 are: ")
    _____                           # Statement-2

    data = _____                    # Statement-3
    for i in data:
        print(i)
    print( )
```

33.	**Give any one point of difference between 'writerow ( ) ' and 'writerows ( )' functions.** **Write a program in Python that defines and calls the following user defined functions:** ***(i) ADD ( ) - To accept and add data of a SHOP to a CSV file "shop.csv". Each record consists of a list with field elements as shopno, name and address to store shop number, shop name and shop address respectively.*** ***(ii) COUNTS( )- TO count the number of records present in the CSV File named "shop.csv"*** **OR** **How rb+ is different from ab+ mode of file handling?** **Write a program in Python that defines and calls the following user defined functions:** (i) ***CreateFile( ) - to create a binary file record.dat having following data fields [rollno, name, class ,section , percentage] the function should be able to insert multiple records in the file.*** (ii) ***searchRecord(num) - to accepts the rollno as argument and display the details of that rollno.***	**5**

	SECTION – E **Each question carries 4 marks**	
Q.No.	**QUESTIONS**	**Marks**
34.	**A Multinational Company XYZ is considering to maintain the records of their employee using SQL to store the data. As a database administer, Abhinay has decided that :** **• Name of the database - db** **• Name of the table – EMPLOYEE**	**4**

EMPLOYEE

EMPID	FIRSTANAME	LASTNAME	Hire_Date	ADDRESS	CITY
1001	George	Smith	11-May-06	83 first street	Paris
1002	Mary	Jones	25-Feb-08	842 Vine Ave	Losantiville
1012	Sam	Tones	12-Sep-05	33 Elm St.	Paris
1015	Peter	Thompson	19-Dec-06	11 Red Road	Paris
1016	Sarath	Sharma	22-Aug-07	440 MG Road	New Delhi
1020	Monika	Gupta	07-Jun-08	9 Bandra	Mumbai

(a) Identify the attribute best suitable to be declared as a primary key as well as foreign key.

(b) Write the degree and cardinality of the table EMPLOYEE.

(c) Insert the following data into the attributes EMPID, FIRSTNAME, LASTNAME, Hire_Date ADDRESS and CITY respectively in the given table EMPLOYEE.
EMPID=1201, FIRSTNAME=Amit, LASTNAME=Singh, Hire_Date=01-Aug-2020 ADDRESS=222E South City and CITY= Kolkata.

(d) Abhinay want to remove the table EMPLOYEE from the database db. Which command will he use.

35. **Ratnesh of class 12 is writing a program to create a CSV file "student.csv" which will contain Name, Date of Birth and place. He has written the following code. As a programmer, help him to successfully execute the given task.** **4**

```
import _______ #Line 1
with open('E:/student.csv',_________) as f: #Line 2
        w = csv. _______(f) #Line 3
        ans= 'y'
        while (ans== 'y'):
                name= input("Name?: ")
                date = input("Date of birth: ")
                place = input("Place: ")
                w.writerow([name, date, place])
                ans=input("Do you want to enter more y/n?: ")
        F=open("E:/student.csv", 'r')
        reader = csv._________(F) #Line 4
        for row in reader:
                print(row)
        F._______( ) #Line 5
```

(a) Name the module he should import in Line 1.

(b) In which mode, Ratnesh should open the file to add data into the file.

	(c) Fill in the blank in Line 3 to write the data to the csv file. **(d) Fill in the blank in Line 4 to read the data from a csv file.**	

KENDRIYA VIDYALAYA SANGATHAN MUMBAI REGION

Sample Question Paper 2022-23

Marking Scheme

Class- XII

Computer Science (083)

Maximum Marks : 70 **Time: 3 Hrs.**

SECTION – A

Q.No.	Answers	Marks
1.	**State True or False** **"In Python, a variable is a place holder for data"** **Ans:- False**	1
2.	**Which value type does input() return?** (a) **Boolean (b) String (c) int (d)float** **Ans:- (b) String**	1
3.	**Which is the correct form of declaration of dictionary?** (a) **D={1:'M' , 2: 'T' , 3:'W'}** (b) **D= {1;'M' , 2; 'T' , 3;'W'}** (c) **D= {1:'M' 2: 'T' 3:'W' }** (d) **D= {1:'M' ; 2: 'T' ; 3:'W'}** **Ans:- (a) D={1:'M' , 2: 'T' , 3:'W'}**	1
4.	**How would you write A^Y in Python as an expression?** (a) **A*Y (b) A**Y (c) A^Y (d) A^^Y** **Ans:- (b) A**Y**	1
5.	**What is the length of the tuple shown below: -** **T= (((('a',1), 'b', 'c'), 'd',2), 'e',3)** (a) **7 (b) 5 (c) 3 (d) 2** **Ans:- (c) 3**	1
6.	**The file mode to open a binary file for writing as well as reading is ----------** (a) **wb (b) wr (c) wb+ (d) wr+** **Ans:- (c) wb+**	1
7.	**Which of the following is not a legal constraint for create table command?**	1

	(a)primary key (b) unique (c) check (d) distinct **Ans:- (d) distinct**	
8.	**Consider the following Sql statement . What type of statement is this?** **SELECT* FROM Employee;** **DML (b) DDL (c) TCL (d) DCL** **Ans:- (a) DML**	**1**
9.	**Which of the following statements would give an error after executing the following code?** **T= 'green' # ---- Statement 1** **T[0]= 'G' #---- Statement 2** **T=[1 , 'B' ,14.5] #---- Statement 3** **T[3]=15 #---- Statement 4** **Options:-** (a) **Statement 2 and 4** (b) **Statement 1 and 2** (c) **Statement 3 and 4** (d) **Statement 1 and 3** **Ans:- (a)Statement 2 and 4**	**1**
10.	**Fill in the blank: -** **A---------- is a property of the entire relation , which ensures through its value that each tuple is unique in a relation.** **(a)Rows (b) key (c) Attribute (d) Field** **Ans:- (b) key**	**1**
11.	**What will be the output of the following statement in python? (fh is a file handle) fh.seek(-30,2)** **Options:- It will place the file pointer:-** **(a) at 30th byte ahead of current current file pointer position** **(b) at 30 bytes behind from end-of file** **(c) at 30th byte from the beginning of the file** **(d) at 5 bytes behind from end-of file** **Ans:- (b) at 30 bytes behind from end-of file**	**1**

12.	**Which of the following keywords will you use in the following query to display the unique values of the column dept_name?** **SELECT ---------- dept_name FROM Company;** **(a)All (b) key (c) Distinct (d) Name** **Ans:- (c) Distinct**	**1**
13.	**The physical address assigned by NIC manufacturer is called---------- address.** **(a)IP (b) MAC (c) TCP (d) URL** **Ans:- (b) MAC**	**1**
14.	**What will the following expression be evaluated to in Python?** **(Given values :- A=16 , B=15)** **print((14+13%15) +A%B//A)** **(a)14 (b) 27 (c) 12 (d) 0** **Ans:- (b) 27**	**1**
15.	**All aggregate functions except ----------ignore null values in their input collection.** **(a)max() (b) count(*) (c) Avg() (d) sum()** **Ans:- (b) count(*)**	**1**
16.	**After establishing database connection, database---------- is created so that the sql query may be executed through it to obtain resultset.** **(a)connector (b) connection (c) cursor (d) object** **Ans:- (c) cursor**	**1**
	Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as **(a) Both A and R are true and R is the correct explanation for A** **(b) Both A and R are true and R is not the correct explanation for A** **(c) A is True but R is False** **(d) A is false but R is True**	
17.	**Assertion (A):- A default argument can be skipped in the function call statement.** **Reasoning (R):- The default values for parameters are considered only if no value is provided for that parameter in the function call statement.**	**1**

	Ans:- (a) Both A and R are true and R is the correct explanation for A	
18.	**Assertion (A): CSV files are delimited files that store tabular data where comma delimits every value.** **Reason (R): For writing onto a CSV file , user data is written on txt.writer object which converts the user data into delimited form and writes it on to the csv file..** **Ans:- (c) A is True but R is False**	**1**

	SECTION-B **Each question carries 2 marks**	
19.	**The following Python code is supposed to print the largest word in a sentence but there are few errors. Rewrite the code after removing errors and underline each corrections made.** **Str=input("Enter a sentence")** **word=split()** **print(word)** **maxlen=0** **largest=""** **for i in word:** **l=len(i)** **if(l>maxlen):** **largest=l** **print(largest)** **Ans** **Str=input("Enter a sentence")** **word=Str.split()** **print(word)** **maxlen=0** **largest=""** **for i in word:** **l=len(i)** **if(l>maxlen):** **largest=i** **maxlen=l** **print(largest)**	**2**
20.	**Write any two differences between telnet and ftp.** **Ans:-**	**2**

Key	TELNET	FTP
Definition	TELNET is an abbreviation for Telecommunication Network. It is simply a connection protocol that allows a user to connect to a remote server that is listening for commands. Once the connection is established, the user can issue commands to the server computer, and examine the responses that are sent back.	FTP stands for File Transfer Protocol and its primarily concern is to facilitate the transfer of files from one point to another, along with a few management capabilities like making and deleting directories.
Port Number Used	In general, TELNET uses the port number 23 for its command operations.	FTP uses port numbers 20 and 21 to establish a connection and perform file transfer operations.
Number of connections	Due to single operated port, TELNET can establish only one connection at a time.	FTP has two ports available, so it can establish two connections; one is for control command and another is for data transfer.
Remote Login	In case of TELNET, remote login is mandatory because issue commands could be run only after login.	Remote login is not mandatory in case of FTP.

Or

Write short notes on URLs and domain names.

Ans:-

A URL (Universal Resource Locator) is a complete web address used to find a particular web page. While the domain is the name of the website, a URL will lead to any one of the pages within the website. Every URL contains a domain name, as well as other components needed to locate the specific page or piece of content.

A domain is the name of a website, a URL is how to find a website, and a website is what people see and interact with when they get there.

21. **1. A List is declared in Python as below**

mylist=[34,65,-77,12,0,113,31]

Find the output of the command

mylist[:5]

Ans. [34, 65, -77, 12, 0]

2. Suppose a Tuple is declared as follows

mytup=(32,93,45,71,-89,111,100)

2

Guess the minimum value for K so, exception handling will print the IndexError message

```
try:
        for i in range( K ):
                print(mytup[i])
except IndexError:
        print("It's out of range now so stop")
```

Ans. 8

22. **Differentiate between primary key and foreign key.** **2**

Ans:-

S.NO.	PRIMARY KEY	FOREIGN KEY
1	A primary key is used to ensure data in the specific column is unique.	A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables.
2	It uniquely identifies a record in the relational database table.	It refers to the field in a table which is the primary key of another table.
3	Only one primary key is allowed in a table.	Whereas more than one foreign key are allowed in a table.
4	It is a combination of UNIQUE and Not Null constraints.	It can contain duplicate values and a table in a relational database.
5	It does not allow NULL values.	It can also contain NULL values.
6	Its value cannot be deleted from the parent table.	Its value can be deleted from the child table.
7	It constraint can be implicitly defined on the temporary tables.	It constraint cannot be defined on the local or global temporary tables.

23. **1. Expand the following** **2**

a. UDP b. CDMA

Ans.

	a. UDP - User Datagram Protocol (UDP) **b. CDMA – Code Division Multiple Access** **2. What is the use of Voip?** **Ans. Voice over Internet Protocol (VoIP), is a technology that allowing you to make voice calls over a broadband Internet connection instead of an analog (regular) phone line.**	
24.	**What possible outputs are expected to be displayed on the screen at the time of execution of the program from the following code? Also specify the minimum and maximum values that can be assigned to the variable c.** **import random** **temp=[10,20,30,40,50,60]** **c=random.randint(0,4)** **for I in range(0, c):** **print(temp[i],"#")** **a) 10#20#** **b) 10#20#30#40#50#** **c) 10#20#30#** **d) 50#60#** **Ans:-** **Minimum value of c is 0** **Maximum value of c is 4** **Possible Answers : 1,2,3** **OR** **Give output of the following:** **def ChangeLst():** **L=[]** **L1=[]** **L2=[]** **for i in range(1,10):** **L.append(i)** **for i in range(10,1,-2):** **L1.append(i)** **for i in range(len(L1)):** **L2.append(L1[i]+L[i])** **L2.append(len(L)-len(L1))** **print(L2)** **Ans:-** **[11, 10, 9, 8, 7, 4]**	**2**

25.	**Differentiate between DELETE and DROP table commands with example.** **Ans:-**	**2**

Parameter	DELETE	DROP
Basic	It removes some or all the tuples from a table.	It removes entire schema, table, domain, or constraints from the database.
Language	Data Manipulation Language command	Data Definition Language command.
Clause	WHERE clause mainly used along with the DELETE command.	No clause required along with DROP command.
Rollback	Actions performed by DELETE can be rolled back as it uses buffer.	Actions performed by DROP can't be rolled back because it directly works on actual data.
Space	space occupied by the table in the memory is not freed even if you delete all the tuples of the table using DELETE	It frees the table space from memory

OR

Categorize the following commands as DDL or DML:
INSERT, DESC, ALTER, DELETE

Ans:-

DDL : ALTER, DESC
DML : INSERT, DELETE

SECTION – C

26.	**(a)**	**Based on the tables CAR and CUSTOMER write the output of the following query:** ***select * from Car NATURAL JOIN Customer;*** **Table : Car**	**1**

Ccode	CarName	Make
501	A-Star	Suzuki

503	Indigo	Tata
502	Innova	Toyota
509	SX4	Suzuki
510	C Class	Mercedes
511	I-20	Tata

Table: Customer

Ccode	Address
502	Kolkata
509	Jaipur
502	Beas

Ans:-

Ccode	CarName	Make	Address
502	Innova	Toyota	Beas
502	Innova	Toyota	Kolkata
509	SX4	Suzuki	Jaipur

(1 mark for correct output)

(b) Write the output of the queries (i) to (iv) based on the table, TRAVEL given below: **2**

Table: TRAVEL

TNO	TNAME	TDATE	KM	TCODE	NOP
101	Janish	2015-02-18	100	101	32
102	Vedika	2014-06-06	65	101	45
103	Tarun	2012-10-09	32	104	42
104	John	2015-10-30	55	105	40
105	Ahmed	2015-12-15	47	101	16
106	Raveena	2016-02-26	82	103	9

1. **Select count(distinct TCODE) from Travel;**

Ans:-

Count(Distinct Tcode)
4

(½ mark for the correct output)

2. **Select TCODE , max(NOP), count(*) from Travel group by TCODE;**

Ans:-

TCODE	MAX(NOP)	COUNT(*)
101	45	3

(½ mark for the correct output)

3. **Select Tname from TRAVEL where NOP < 20 order by Tname desc;**

Ans.

TNAME
Raveena
Ahmed

(½ mark for the correct output)

4. **Select MIN(KM) from Travel where KM between 60 and 100;**

Ans.

MIN(KM)
65

(½ mark for the correct output)

27 **Write A Function COUNTWORDS( ) That Read A Text File 'PYTHON.TXT' And Display The Total Number Of Words which Begins By Uppercase Character.** **3**

Ans.

```
def COUNTWORDS( ):
    fin=open('PYTHON.TXT', 'r')
    count=0
    for line in fin:
            for i in line.split( ):
            if i[0].isupper( ):
```

```
                                    count+=1
        print(count)
        fin.close( )

COUNTWORDS( )
```

(½ mark for correctly opening and closing the file
½ for correct loop
½ for correct if statement
½ for split ( )
½ for correctly incrementing count
½ for displaying correct output
)
Note: Any other relevant and correct code may be marked

OR

Write a python function ALCount(), which should read each character of text file "STORY.TXT" and then count and display the number of lines which begins from character 'a' and '*l*' individually (including upper cases 'A' and 'L' too)

Ans.

```
def ALCount( ):
    f = open('STORY.TXT' , 'r' )
    countA = 0
    countL = 0
    for line in f:
        if line[0] == 'A' or line[0] == 'a' :
            countA+=1
        if line[0] == 'L' or line[0] == 'l' :
            countL+=1
    print('A or a : ', countA)
    print('L or l : ', countL)
    f.close()

ALCount( )
```

(½ mark for correctly opening and closing the file
½ for correct loop
1 for correct if statement

	½ for correctly incrementing count **½ for displaying correct output** **)** **Note: Any other relevant and correct code may be marked**	

28.	**(a) Write the output of SQL queries (i) to (iv) based on table SCHOOLADMIN and ROADMIN, given below:**	3

Table: SCHOOLADMIN

ANO	NAME	STREAM	DOB	PHONE	FEE
101	Srishti B	Business Admin	2005-05-12	12343224	2000
102	Aman	Sciences	2005-11-02	67134324	4000
103	Shivam	Sciences	2006-01-23	51134324	3500
104	Banita	Business Admin	2005-10-12	13241934	2500
105	Myra	Fine Arts	2005-07-01	12445931	1500
106	Raghav	Humanities	2005-06-05	42155931	5000
107	Medini	Fine Arts	2005-09-05	51215931	1000
108	Udai Veer	Sciences	2006-11-25	55134324	4500

Table: ROADMIN

R_NO	STREAM	PLACE
1	Sciences	Agra
2	Fine Arts	Jaipur
3	Humanities	Tinsukia

(i) SELECT Stream, Max(FEE) FROM SCHOOLADMIN group by stream;

Ans.

Stream	Max(FEE)
Business Admin	2500
Sciences	4500
Fine Arts	1500
Humanities	5000

(½ mark for the correct output)

(ii) SELECT Max(DOB), Min(DOB) FROM SCHOOLADMIN WHERE STREAM != "Sciences ";

Ans.

Max(DOB)	Min(DOB)
2006-11-25	2005-11-02

(½ mark for the correct output)

(iii) **SELECT Name, Phone, R.Place, DOB FROM SCHOOLADMIN S ROADMIN R where WHERE S.Stream = R.Stream and ANO > 104;**

Ans.

Name	Phone	Place	DOB
105	12445931	Jaipur	2005-07-01
106	42155931	Tinsukia	2005-06-05
107	51215931	Jaipur	2005-09-05
108	55134324	Agra	2006-11-25

(½ mark for the correct output)

(iv) **SELECT NAME, Place FROM SCHOOLADMIN S, ROADMIN R WHERE STREAM="Fine Arts" and S.Stream = R.Stream;**

Ans.

Name	Place
Myra	Jaipur
Medini	Jaipur

(½ mark for the correct output)

(b) Write the command to view the structure of the table 'ROADMIN'.

Ans. desc ROADMIN;

	(1 mark for the correct answer)	

29.	**Define a function add(a , b) where a and b are lists of same length.** 1. **If length of the lists is not equal, function should display a message 'Length not equal'** 2. **If length is equal then elements of both the lists should be added together and form a new list.** **For example :** **A = [1, 2, 3, 4]** **B= [8,11,27, 14]** **C= [9, 13, 30, 18]** **Ans.** **def add (a , b):** **c=[ ]** **if len(a) != len(b):** **print('Length not equal')** **else:** **for i in range(len(a)):** **c.append(a[i] + b[i])** **print(c)** **add ([1,2,3,4] , [8,11,27,14])** **(½ mark for correct function header** **1 mark for correct loop** **1 mark for correct if statement** **½ mark for append function** **)** **Note: Any other relevant and correct code may be marked**	**3**

30.	**A list contains following record of a student:** **[SID, Name, Marks]** **Write the following user defined functions to perform given operations on the stack named STUD:** **(i) Push_student(s) – To push an object containing SID and Name of student whose marks are more than 75 to the stack.**	**3**

(ii) Pop_student( ) – To Pop the objects from the stack and display them. Also display 'Stack empty' when there is no element in the stack.

Ans.

```
STUD= [ ]
def Push_Student(s):
        if s[2] > 75:
                L1 = [s[0],s[1]]
                STUD.append(L1)

def Pop_student( ):
        num=len(STUD)
        while len(STUD) ! = 0:
                d=STUD.pop()
                print(d)
                num=num-1
        else:
                print("Stack empty")
```

(1½ marks for correct push element and 1½ marks for correct pop element)

OR

Write a function Push(STUD) in python, where STUD is a dictionary containing The details of stationary items- {Sname : marks}.
The function should push the names of those students in the stack who have marks less than 33. Also display the count of elements pushed into the stack.

Ans.

```
Stack= [ ]
def Push(STUD):
        cnt= 0
        for k in STUD:
                if (STUD[k] < 33):
                        Stack.aappend(k)
                        Cnt = cnt + 1
        print(" The count of elements =",cnt)
```

(1 mark for correct function header
1 mark for correct loop

	½ mark for correct if statement ½ mark for correct display of count)	

SECTION – D

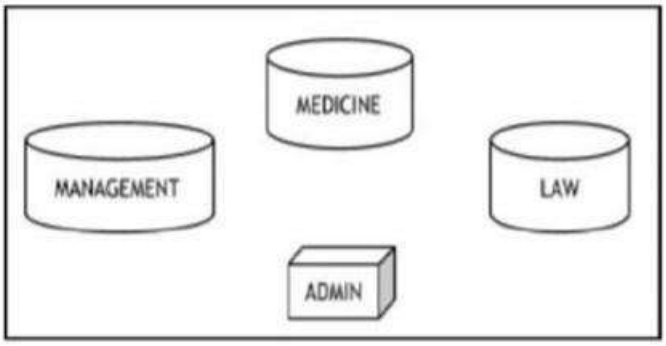
31.	**Bright training institute is planning to set up its centre in Amritsar with four specialised blocks for Medicine, Management, Law courses along with an Admission block in separate buildings. The physical distance between these blocks and the number of computers to be installed in these blocks are given below. You as a network expert have to answer the queries raised by their board of directors as given in (I) to (IV)**	**5**

Shortest distance between various locations in metres

Admin Block to Management Block	**60**
Admin Block to Medicine Block	**40**
Admin Block to Law Block	**60**
Management Block to Medicine Block	**50**
Management Block to Law Block	**110**
Law Block to Medicine Block	**40**

Number of Computers installed at various locations are as follows

Admin Block	**150**
Management Block	**70**
Medicine Block	**20**
Law Block	**50**



(i) Suggest the most suitable place to install the main server of this institution to get efficient connectivity.

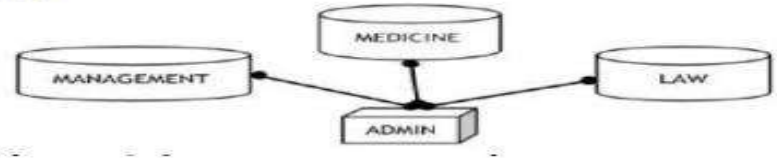
Ans: Admin Block is the most appropriate place to install the main server as it has the maximum number of computers.

(1 mark for the correct answer)

(ii) Suggest the best wired medium and draw the best cable layout for effective network connectivity of the blocks having server with all the other blocks.

Ans. Fibre cable

(ii)



(½ mark for the correct wired medium , ½ mark for correct layout)

(iii) Suggest the devices to be installed in each of these buildings for connecting computers installed within the building out of the following:

- **Modem**
- **Switch**
- **Gateway**
- **Router**

Ans. Switch

(1 mark for the correct answer)

(iv) Suggest the most suitable wired medium for efficiently connecting computers installed in every building out of the following network cables.

- **Coaxial cable**
- **Ethernet cable**
- **Single pair**
- **Telephone cable.**

Ans. Ethernet cable

(1 mark for the correct answer)

(v) Mr X works in the admin block and he usually connects his projector to his mobile phone for presentation purpose. Identify the type of network he creates

- **PAN**
- **LAN**
- **MAN**
- **WAN**

Ans. PAN

(1 mark for the correct answer)

32.	**(a) Find and write the output of the following Python code:**	2

```
def Show(str):
   m=""
   for i in range(0,len(str)):
      if(str[i].isupper()):
         m=m+str[i].lower()
      elif str[i].islower():
          m=m+str[i].upper()
      else:
         if i%2!=0:
                        m=m+str[i-1]
         else:
                        m=m+"#"
   print(m)

Show('CBSE kvs')
```

Ans. cbse#KVS

(1 mark for cbse and 1 mark for #KVS)

(b) The code given below inserts the following record in the table "Library": 3

BID – integer
BTitle – string
Pages – Integer
Price – Integer

Note the following to establish connectivity between Python and MySQL:

- **Username is root**
- **Password is kvs**
- **The table exists in MySQL database name LIB.**
- **The details (BID, BTitle, Pages, Price) are to be accepted from user**

Write the following missing statements to complete the code:

Statement-1 : to form the cursor object
Statement-2 : to execute the command that inserts record in table
Statement-3 : to add the record permanently in the database

```
import mysql.connector as mc
def sql_data( ):
        con1=mc.connect(host="localhost", user='root',
                password='kvs', database='LIB')
        mycur= _____          # Statement-1
        BID=int(input('Enter book ID='))
        BTitle=input('Enter book title=')
        Pages = int(input("Enter no. of pages="))
        Price = int(input("Enter book price="))
        Qry="insert into library values ( {}, '{}', {}, {})". format(BID,
```

	BTitle, Pages, Price) *_____* *# Statement-2* *_____* *# Statement-3* *print('Data added in the table")* **Ans:** **Statement-1: con1.cursor()** **Statement-2: mycur.execute(Qry)** **Statement-3: con1.commit()** **(1 mark for each correct answer)**	

OR

	(a) Find and write the output of the following python code: *def changer(p,q=10):* *p=p/q* *q=p%q* *print(p, '#',q)* *return p* *a=200* *b=20* *a=changer(a,b)* *print(a,'$',b)* *b=changer(b)* *print(a,'$',b)* **Ans:** **10.0 # 10.0** **10.0 $ 20** **2.0 # 2.0** **10.0 $ 2.0** **(½ mark for each correct line output)**	**2**
	(b) The code given below reads the following record from the table "Library" and display only those records who have price less than 500: *BID – integer* *BTitle – string* *Pages – Integer* *Price – Integer*	**3**

	Note the following to establish connectivity between Python and MySQL: - **Username is root** - **Password is kvs** - **The table exists in MySQL database name LIB.** **Write the following missing statements to complete the code:** **Statement-1 : to form the cursor object** **Statement-2 : to execute the query that extracts records of those books whose Price is less than 500** **Statement-3 : to read the complete result of the query into the object data, from the table Library in the database.** *import mysql.connector as mc* *def sql_data( ):* *con1=mc.connect(host="localhost", user='root',* *password='kvs', database='LIB')* *mycur= _____ # Statement-1* *print("Books with price less than 500 are: ")* *_____ # Statement-2* *data = _____ # Statement-3* *for i in data:* *print(i)* *print( )* **Ans:** **Statement-1: con1.cursor()** **Statement-2: mycur.execute("select * from library where price < 500")** **Statement-3: mycur.fetchall( )** **(1 mark for each correct statement)**	

33.	**Give any one point of difference between 'writerow ( ) ' and 'writerows ( )' functions.** **Write a program in Python that defines and calls the following user defined functions:** **(i) ADD ( ) - To accept and add data of a SHOP to a CSV file "shop.csv". Each record consists of a list with field elements as shopno, name and address to store shop number, shop name and shop address respectively.** **(ii) COUNTS( )- To count the number of records present in the CSV File named "shop.csv"**	5

Ans.

The technical difference is that writerow is going to write a list of values into a single row whereas writerows is going to write multiple rows from a buffer that contains one or more lists.

Program:

```
import csv
def ADD( ):
        fout = open("shop.csv", 'a', newline= '\n')
        wr=csv.writer(fout)
        shopno=int(input("Enter Shop No.= "))
        name=input("Enter Shop name = ")
        address=input("Enter Address= "))
        lst=[shopno,name,address] --------- ½  mark
        wr.writerow(lst) --------- ½  mark
        fout.close()
def COUNTS ():
        fin=open("shop.csv","r",newline="\n")
        data=csv.reader(fin)
        d=list(data)
        print(len(d))
        fin.close()
ADD()
COUNTS()
```

(1 mark for difference
½ mark for importing CSV module
1 ½ mark each for correct definition of ADD() and COUNTS()
½ mark for function call statements)

OR

How rb+ is different from ab+ mode of file handling? **5**

Write a program in Python that defines and calls the following user defined functions:

(i) **CreateFile( ) - to create a binary file record.dat having following data fields [rollno, name, class ,section , percentage] the function should be able to insert multiple records in the file.**

(ii) **searchRecord(num) - to accepts the rollno as argument and display the details of that rollno.**

Ans:

rb+: To open a binary file for both read and write
ab+: To open a binary file for both append and read

Program:

```
import pickle
def createfile( ):
    f = open ( 'record.dat' , 'wb' )
    while True:
        rno = int ( input ('Enter the roll number  : ' ) )
        name = input ( 'Enter the name : ' )
        clas = int (input ('Enter Class : ') )
        section = input ( 'Enter Section : ' )
        per = float (input ( 'Enter percentage : ' ) )
        record = [rno,name,clas,section,per]
        pickle.dump ( record,f )
        choice = input ( 'Do you have more records (y/n) : ' )
        if choice == 'n' or choice == 'N':
            break
    f.close( )


def searchRecord(num):
      f=open('record.dat','rb+')
      found=0
      try:
            while True:
                  record = pickle.load ( f )
                  if record[0] == num:
                        print(record)
                        found=1
                        break
         except EOFError:
              pass
          if found==0:
              print('Record not found')
    f.close( )
```

	createfile() **rn=int(input('Enter roll no. to search=');** **searchRecord(rn)** **(1 mark for difference** **½ mark for importing pickle module** **1½ marks each for correct definition of createfile() and searchRecord()** **½ mark for function call statements)**	

	SECTION -E **Each question carries 4 marks**	
34.	**A Multinational Company XYZ is considering to maintain the records of their employee using SQL to store the data. As a database administer, Abhinay has decided that :** **• Name of the database - db** **• Name of the table – EMPLOYEE**	**4**

EMPLOYEE

EMPID	FIRSTANAME	LASTNAME	Hire_Date	ADDRESS	CITY
1001	George	Smith	11-May-06	83 first street	Paris
1002	Mary	Jones	25-Feb-08	842 Vine Ave	Losantiville
1012	Sam	Tones	12-Sep-05	33 Elm St.	Paris
1015	Peter	Thompson	19-Dec-06	11 Red Road	Paris
1016	Sarath	Sharma	22-Aug-07	440 MG Road	New Delhi
1020	Monika	Gupta	07-Jun-08	9 Bandra	Mumbai

(a) Identify the attribute best suitable to be declared as a primary key as well as foreign key.

Ans. empid

(b) Write the degree and cardinality of the table EMPLOYEE.

Ans. Degree – 6

Cardinality - 6

(c) Insert the following data into the attributes EMPID, FIRSTNAME, LASTNAME, Hire_Date ADDRESS and CITY respectively in the given table EMPLOYEE.
EMPID=1201, FIRSTNAME=Amit, LASTNAME=Singh, Hire_Date=01-Aug-2020 ADDRESS=222E South City and CITY= Kolkata.

Ans. INSERT INTO EMPLOYEE values(1201,"Amit","Singh","2020-08-01"," 222E South City","Kolkata")

	(d) Abhinay want to remove the table EMPLOYEE from the database db. Which command will he use. **Ans. Drop table employee;**	
35.	**Ratnesh of class 12 is writing a program to create a CSV file "student.csv" which will contain Name, Date of Birth and place. He has written the following code. As a programmer, help him to successfully execute the given task.** **import _____ #Line 1** **with open('E:/student.csv',_____) as f: #Line 2** **w = csv. _____(f) #Line 3** **ans= 'y'** **while (ans== 'y'):** **name= input("Name?: ")** **date = input("Date of birth: ")** **place = input("Place: ")** **w.writerow([name, date, place])** **ans=input("Do you want to enter more y/n?: ")** **F=open("E:/student.csv", 'r')** **reader = csv._____(F) #Line 4** **for row in reader:** **print(row)** **F._____( ) #Line 5** **(a) Name the module he should import in Line 1.** **Ans. CSV** **(b) In which mode, Ratnesh should open the file to add data into the file.** **Ans. a or a+** **(c) Fill in the blank in Line 3 to write the data to the csv file.** **Ans. writer** **(d) Fill in the blank in Line 4 to read the data from a csv file.** **Ans. reader**	**4**

Class: XII Session: 2022-23

Computer Science (083)

Sample Question Paper (Theory)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains five sections, Section A to E.

2. All questions are compulsory.

3. Section A have 18 questions carrying 01 mark each.

4. Section B has 07 Very Short Answer type questions carrying 02 marks each.

5. Section C has 05 Short Answer type questions carrying 03 marks each.

6. Section D has 03 Long Answer type questions carrying 05 marks each.

7. Section E has 02 questions carrying 04 marks each. One choice is given in Q35 against part c only.

8. All programming questions are to be answered using Python Language only.

SECTION A		
1	In a Python program, a control structure: (A) Defines program-specific data structre (B) Directs the order of Execution of statements in the program (C) Dictates what happens before the program starts and after it terminates (D) None of above	1
2	Find the invalid Identifier from the following: (A) Myname (B) 1Myname (C) My_name (D) Myname2	1
3	Which of the following is invalid method for fetching the records from database within Python ? (A) fetchone() (B) fetchmany() (C) fetchall() (D) fetchmulti()	1
4	What is the default EOL Character in python ? (A) \n (B) \t (C) \l (D) \h	1
5	This method is used to load (unpickling) data from binary file (A) load() (B) dump() (C) seek() (D) tell()	1
6	Identify the valid arithmetic operator in python (A) ? (B) < (C) ** (D) and	1
7	Given the following dictionaries dict_exam={"Exam":"AISSCE", "Year":2023} dict_result={"Total":500, "Pass_Marks":165} Which statement will merge the contents of both dictionaries? a. dict_exam.update(dict_result) b. dict_exam + dict_result c. dict_exam.add(dict_result) d. dict_exam.merge(dict_result)	1
8	Consider the given expression False, True, NOT, OR, True, False,AND,OR Which of the following is the correct output if expression is evaluated? (A) True (B) False (C) None (D) Null	1
9	Give the output of the following x=3 x+=x-x print(x) (A) 3 (B) 0 (C) 2 (D) 1	1
10	Bluetooth is an example of	1

	(A) LAN (B) WAN (C) PAN (D) Virtual private network	
11	State true or false " Immutable data type are those that can never change their values "	1

12	Which of the following statement(s) would give an error after executing the following code?
	x=50 # Statement 1
	Def func(x) # Statement 2
	x=2 # Statement 3
	func(x) # Statement 4
	print(x) # Statement 5
	
	(A) Statement 1 (B) Statement 3 & 4 (C) statement 4 (D) Statement 2
		1

13	which of the following is the correct output for executing the following python statement? print(5 + 3**2 / 2) (A) 32 (B) 8.0 (C) 9.5 (D) 32.0	1
14	Which topology is based on a central node which acts as a hub ? (A) Bus topology (B) Star topology (C) Tree topology (D) Hybrid Topology	1
15	To establish a connection between Python and SQL database, what of the following statement is connecting database server? (A) importMySQLdb (B) MySQLdb.connect (C) db.cursor (D) None of the above	1
16	_____function place the pointer at the specified position of the file pointer by in an opening file. (A) seek() b) tell() c) read() d) load()	1
Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (a) Both A and R are true and R is the correct explanation for A (b) Both A and R are true and R is not the correct explanation for A (c) A is True but R is False (d) A is false but R is True		
17	Assertion (A):- If the arguments in a function call statement match the number and order of arguments as defined in the function definition, such arguments are called positional arguments. Reasoning (R):- During a function call, the argument list first contains default argument(s) followed by positional argument(s).	1
18	Assertion (A): CSV (Comma Separated Values) is a file format for data storage which looks like a text file. Reason (R): The information is organized with one record on each line and each field is separated by comma.	1
SECTION B		

19	What possible outputs(s) are expected to be displayed on screen at the time of execution of the program from the following code? Also specify the maximum values that can be assigned to each of the variables Lower and Upper. import random AR=[20,30,40,50,60,70]; Lower=random.randint(1,3) Upper=random.randint(2,4) for K in range(Lower, Upper+1): print (AR[K],end="#") (A) 10#40#70# (B) 30#40#50# (C) 50#60#70# (D) 40#50#70#	2
20	(a) Write the full form of the following i) ARPANET ii) WiMax (b) Name the different guided media for data transmission.	2

21	Predict the output of the following code
	def Alter(M,N=50):
	  M=M+N
	  N=M-N
	  print(M,"@",N)
	  return(M)
	A=200
	B=100
	A=Alter(A,B)
	print(A,"#",B)
	B=Alter(B)
	print(A,"@",B)
		2

22	Rewrite the following code in Python after removing all syntax error(s). Underline each correction done in the code. 30=Value for VAL in range(0,Value) If val%4=0: print (VAL*4) Else val%5==0: print (VAL+3)	2
23	What are the different switching techniques in networking ?	2
24	(a) Given is a Python string declaration: title="## ICC CRICKET T20 W'Cup 2022@@" Write the output of: print(title[::-1]) (b) Write the output of the code given below: my_dict = {"name": "Aman", "age": 26} my_dict['age'] = 27 my_dict['address'] = "Delhi" print(my_dict.items())	2
25	Differentiate between WHERE and HAVING clause.	2
SECTION C		

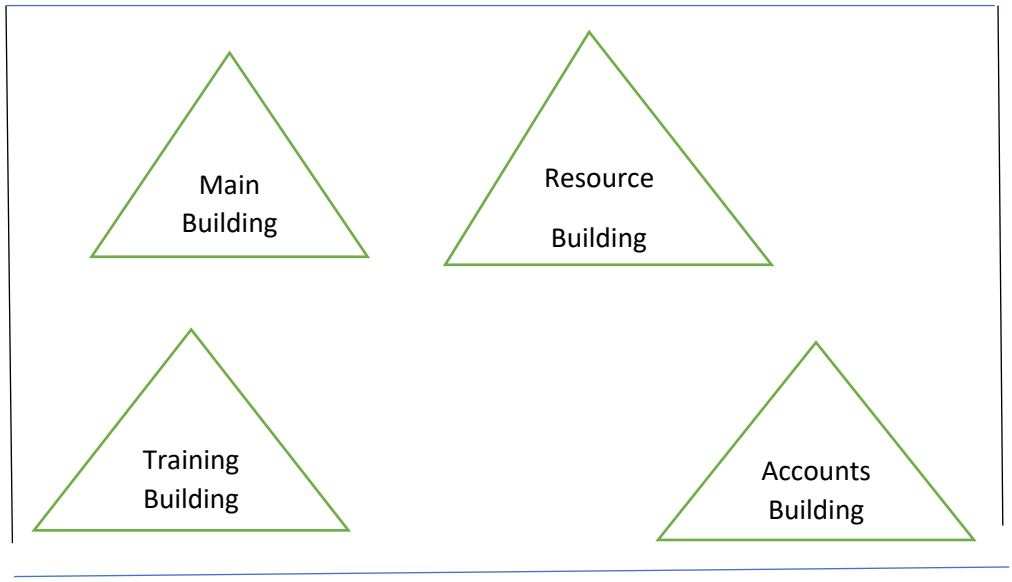
26.	a) Consider the following tables – student and games:
	
	Table : student
	Rollno | Name
	1 | Rohan
	2 | Jaya
	3 | Teena
	
	table : games
	gameno | gname
	10 | Football
	11 | Lawn Tennis
	
	What will be the output of following statement ?
	
	Select Name, gname from student, games ;
	
	b) write the output of queries i) to iv) based on the table, LOANS given below:
	Table : LOANS
	
	AccNo | Cust_Name | Loan_Amount | Instalments | Int_Rate | Start_Date | I
	1 | R.K.Gupta | 300000 | 36 | 12.00 | 2009-07-19 | 1
	2 | S.P.Sharma | 500000 | 48 | 10.00 | 2008-03-22 | 1
	3 | K.P. Jain | 300000 | 36 | NULL | 2007-03-08 | 1
	4 | M.P.Yadav | 800000 | 60 | 10.00 | 2008-12-06 | 2
	5 | S.P.Sinha | 200000 | 36 | 12.50 | 2010-01-03 | 4
	6 | P.Sharma | 700000 | 60 | 12.50 | 2008-06-05 | 3
	7 | K.S. Dhall | 500000 | 48 | NULL | 2008-03-05 | 3
	
	i) Select sum(Loan_Amount) from LOANS where Int_Rate > 10 ;
	ii) Select max(Interest) from LOANS;
	iii) Select count(*) from LOANS where Int_Rate is NULL;
	iv) Select * from LONAS GROUP BY Interest HAVING Instalments >= 10;
		1 + 2

27.	Write a user – defined function countH() in Python that displays the number of lines starting with 'H' in the file 'Para.txt". Example , if the file contains: Whose woods these are I think I know. His house is in the village though; He will not see me stopping here To watch his woods fill up with snow. Output: The line count should be 2.	3
	OR Write a function countmy() in Python to read the text file "DATA.TXT" and count the number of times "my" occurs in the file. For example , if the file "DATA.TXT" contains – "This is my website. I have displayed my preference in the CHOICE section." The countmy( ) function should display the output as: "my occurs 2 times"	

28.	Write the output of the SQL queries i) to iv) based on the relations SHOP and ACCESSORIES given below:
	
	Table: SHOP
	
	Id | **SName** | **Area**
	S01 | ABC Computronics | CP
	S02 | All Infotech Media | GK II
	S03 | Tech Shopee | CP
	S04 | Geek Tenco Soft | Nehru Place
	S05 | Hitech Tech Store | Nehru Place
	
	Table : ACCESSORIES
	
	No | Name | Price | Id
	A01 | Motherboard | 12000 | S01
	A02 | Hard Disk | 5000 | S01
	A03 | Keyboard | 500 | S02
	A04 | Mouse | 300 | S01
	A05 | Motherboard | 13000 | S02
	A06 | Keyboard | 400 | S03
	A07 | LCD | 6000 | S04
	T08 | LCD | 5500 | S05
	T09 | Mouse | 350 | S05
	T010 | Hard Disk | 450 | S03
	
	i) Select distinct Name from ACCESSORIES where Price > = 5000;
	ii) Select Area, count(*) from SHOP group by Area;
	iii) Select count(distinct Area) from SHOP;
	iv) Select A.Name , A.Price from ACCESSORIES A, SHOP S where A.Id =S.Id and Price >=12000;
	
	b) write the command to create a database employee.
		2+1

29.	Write a python function is_even_num(l), where l is the list of elements passed as arguments to the function. The function return even numbers from a given list: Sample List : [1,2,3,4,5,6,7,8,9] Expected Result:[2,4,6,8]	3
30.	Write a program to implement a Stack for these book-details(book no, book name). That is , now each item node of the stack contains two types of information – a book no, and its name. Just implement PUSH and Display Operations create a Push() and Display() functions: OR	3

	Write a function in Python MakePush(Package) and MakePop(Package) to add a new Package and delete a Package from a List of package description, considering them to act as puch and pop operations of the Stack data structure.	
	SECTION D	
31.	"Vidya for All" is an educational NGO. It is setting up its new campus at Jaipur for its web-based activities. The campus has four building as shown in diagram below:	5



Center to Center distance between various building as per architectural drawings (in meters is as follows:

Main Building to Resource Building	120m
Main Building to Training Building	40m
Main Building to Accounts building	135m
Resource Building to Training Building	125m
Resource Building to Account Building	45m
Training building to Account Building	110m

Expected number of computers in each building is as follows:

Main Building	15
Resource Building	25
Training Building	250
Accounts Building	10

i)Suggest the layout of connection between the building.
ii)Suggest the most suitable (i.e. building) to house the server of this NGO. Also provide a suitable reason for your suggestion.
iii)Suggest the placement of the following devices with justification:
a)Repeater b)Hub / Switch

	iv) The NGO is planning to connect its International office situated in delhi . which out of the following wired communication links will you suggest for a very high speed connectivity ? a) Telephone Analog line b) Optical Fiber iii)Ethernet Cable v)Suggest the protocol to be used to update website of their organization from Training Building.	

32.	a) Predict the output of the following code fragment ?
	def check(n1=1, n2=2):
	n1=n1+n2
	n2+=1
	print(n1,n2)
	check ( )
	check(2,1)
	
	b.) study the database 'company' that has a table 'Emp' that stores IDs of employees. Code contain the connectivity to retrieve data, one record at a time, for employees with IDs less than 10.
	Write the missing statements
	i)Statement1 .
	ii)Statement2
	iii)Statement3
	
	import MYSQLdb as mycon
	try:
	db=_____.connect(host="localhost", user ="root", passwd=" ",
	database ="company") **##write missing part in statement1**
	cursor = _____#**missing Statement2**
	sql="select * from Emp where id < 10")
	number_of_rows=cursor.execute(sql)
	print(cursor.fetchone())
	db._____ **##missing statement3**
	except mycon.DataError as e:
	print("DataError")
	print(e)
	
	OR
	a)Predict the output of the following code given below:
	def fun(s):
	k=len(s)
	m=" "
	for i in range(0,k):
	if(s[i].isupper()):
	m=m+s[i].lower( )
	elif s[i].isalpha( ):
	m=m+s[i].upper( )
	else:
	m = m + 'bb'
	print(m)
	fun('school2@com')
		2 + 3

b)Consider the following code which is doing following ,
updating the records of employees by increasing the salary by Rs.1000 of all those employees who are getting less than Rs. 80000.
Write the following missing statements:
i)statement1
ii)statement2
iii)statement3

```
import _______.connector     #statement1
db1=mysql.connector.connect(host="localhost", user="root",password="",
databse="company")
cursor = _________________ #statement2
sql="update emp set salary = salary + 1000 where salary <80000;"

try:
  cursor._________________ #statement3
  bd1.commit( )
except:
 db1.rollback( )

 bd1.close( )
```

33. Write a user defined function to perform read and write operations onto a 'student.csv' file having fields roll number, name, stream and marks. — 5

Or

Write the difference between text and csv file ?
Ranjan kumar of class 12 want to write a program on csv file "user.csv" he wants to store user id and password in user.csv files.
Example he want to write following data where first is user id and second is password in the file :
"Arjun", "123@456"
"Arunima", "123#453"
"Shyam", "12&1234"

Create following functions:
addCsvFile( ):- which will add user id and password in "user.csv" file.
defReadCsvFile( ):- which will read the user id and password form "user.csv"file.

SECTION E

34. Consider the following table STORE: — 1+1+2

Table : STORE

ItemNo	ItemName	Scode	Qunatity
2005	Sharpener Classic	23	60
2003	Ball Pen 0.25	22	50
2002	Get Pen Premium	21	150
2006	Get Pen Classic	22	220

2001	Eraser Small	22	220
2004	Eraser Big	22	110

Based on the above STOR Table and data in it answer the following questions:

a) Identify the attribute best suitable for Primary key.
b) Write the degree and cardinality of the table STORE.
c) Write the following statement :
   i) Insert the following data in the table.
   ItemNo=2010, ItemName="Note Book" , Scode=25, quantity = 50
   ii) Increase the quantity of all the item by 10.

Or

c)
write the statement to:
   i) Delete the record from store table where item No. 2005.
   ii) Add column price in the above store table with datatype as float.

35. Vishal has been given following incomplete code which takes a students details (rollnumber, name and marks) and writes into binary file stu.dat using pickling. 1+1+1+1

```
import  _____________________    # statement 1
sturno = int(input("Enter the rollno"))
stuname= input("Enter the name"))
stumarks=float(input("Enter marks"))
stu1={"RollNo":sturno, "Name":stuname, "Marks":stumarks}
with  _____________________ as fh:  #statement 2
      pickle.dump(_________)              # statement 3
with open("Stu.dat","rb") as fin:
      _____________________          # statement 4

     Print(Rstu)
if Rstu["Marks"] >= 85:
        print("Eligible for merit certificate")
else:
        print("Not Eligible for merit certificate")
```

Class: XII Session: 2022-23

Computer Science (083)

Sample Question Paper (Theory)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains five sections, Section A to E.

2. All questions are compulsory.

3. Section A have 18 questions carrying 01 mark each.

4. Section B has 07 Very Short Answer type questions carrying 02 marks each.

5. Section C has 05 Short Answer type questions carrying 03 marks each.

6. Section D has 03 Long Answer type questions carrying 05 marks each.

7. Section E has 02 questions carrying 04 marks each. One choice is given in Q35 against part c only.

8. All programming questions are to be answered using Python Language only.

SECTION A		
1	In a Python program, a control structure: (E) Defines program-specific data structre (F) Directs the order of Execution of statements in the program (G) Dictates what happens before the program starts and after it terminates (H) None of above ANS : B	1marks each
2	Find the invalid Identifier from the following: (E) Myname (F) 1Myname (G) My_name (H) Myname2 ANS : B	1marks each
3	Which of the following is invalid method for fetching the records from database within Python ? (E) fetchone() (F) fetchmany() (G) fetchall() (H) fetchmulti() ANS : D	1marks each
4	What is the default EOL Character in python ? (B) \n (B) \t (C) \l (D) \h ANS : A	1marks each
5	This method is used to load (unpickling) data from binary file (B) load() (B) dump() (C) seek() (D) tell() ANS : A	1marks each
6	Identify the valid arithmetic operator in python (B) ? (B) < (C) ** (D) and ANS : C	1marks each
7	Given the following dictionaries dict_exam={"Exam":"AISSCE", "Year":2023} dict_result={"Total":500, "Pass_Marks":165} Which statement will merge the contents of both dictionaries? a. dict_exam.update(dict_result) b. dict_exam + dict_result c. dict_exam.add(dict_result) d. dict_exam.merge(dict_result) ANS : A	1marks each
8	Consider the given expression False, True, NOT, OR, True, False,AND,OR Which of the following is the correct output if expression is evaluated? (B) True (B) False (C) None (D) Null ANS : B	1marks each
9	Give the output of the following x=3	1marks each

	x+=x-x print(x) (B) 3 (B) 0 (C) 2 (D) 1 ANS : A	
10	Bluetooth is an example of (B) LAN (B) WAN (C) PAN (D) Virtual private network ANS : C	1marks each
11	State true or false “ Immutable data type are those that can never change their values “ ANS TRUE	1marks each

12	Which of the following statement(s) would give an error after executing the following code?
	x=50 # Statement 1
	Def func(x) # Statement 2
	x=2 # Statement 3
	func(x) # Statement 4
	print(x) # Statement 5
	
	(B) Statement 1 (B) Statement 3 & 4 (C) statement 4 (D) Statement 2
	
	ANS : D
		1marks each

13	which of the following is the correct output for executing the following python statement? print(5 + 3**2 / 2) (B) 32 (B) 8.0 (C) 9.5 (D) 32.0 ANS : C	1marks each
14	Which topology is based on a central node which acts as a hub ? (B) Bus topology (B) Star topology (C) Tree topology (D) Hybrid Topology ANS : B	1marks each
15	To establish a connection between Python and SQL database, what of the following statement is connecting database server? (E) importMySQLdb (F) MySQLdb.connect (G) db.cursor (H) None of the above ANS : B	1marks each

16	_____function place the pointer at the specified position of the file pointer by in an opening file. (B) seek() b) tell() c) read() d) load() ANS A	1marks each
Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as (A) Both A and R are true and R is the correct explanation for A (B) Both A and R are true and R is not the correct explanation for A (C) A is True but R is False (D) A is false but R is True		
17	Assertion (A):- If the arguments in a function call statement match the number and order of arguments as defined in the function definition, such arguments are called positional arguments. Reasoning (R):- During a function call, the argument list first contains default argument(s) followed by positional argument(s). ANS : C A is True but R is False	1marks each
18	Assertion (A): CSV (Comma Separated Values) is a file format for data storage which looks like a text file. Reason (R): The information is organized with one record on each line and each field is separated by comma. ANS : (A) Both A and R are true and R is the correct explanation for A	1marks each
SECTION B		
19	What possible outputs(s) are expected to be displayed on screen at the time of execution of the program from the following code? Also specify the maximum values that can be assigned to each of the variables Lower and Upper. import random AR=[20,30,40,50,60,70]; Lower=random.randint(1,3) Upper=random.randint(2,4) for K in range(Lower, Upper+1): print (AR[K],end="#") (A) 10#40#70# (B) 30#40#50# (C) 50#60#70# (D) 40#50#70# ans : (B) Maximum value that assigned to Lower and Upper is 3 and 4 respectively	1marks for each correct answer
20	(a) Write the full form of the following i) ARPANET ii) WiMax ANS : i) ARPANET : Advanced Research Project Agency for Networking	1marks for a and b

	ii) WiMax : Worldwide Interoperability for Microwave Access (b) Name the different guided media for data transmission. Ans : twisted pair, coaxial cable , optical fibre , ethernet cable	
21	Predict the output of the following code def Alter(M,N=50): M=M+N N=M-N print(M,"@",N) return(M) A=200 B=100 A=Alter(A,B) print(A,"#",B) B=Alter(B) print(A,"@",B) Ans : 300 @ 200 300 # 100 150 @ 100 300 @ 150	½ marks for each correct row
22	Rewrite the following code in Python after removing all syntax error(s). Underline each correction done in the code. 30= Value for VAL in range(0,Value) If val%4=0: print (VAL*4) Else val%5==0: print (VAL+3) Ans : <u>Value=30</u> for VAL in range(0,Value<u>) :</u> if val%<u>4 = = 0:</u> print (VAL*4) <u>else</u> val%5==0: print (VAL+3)	2 ½ marks for each correct row
23	What are the different switching techniques in networking ? Ans : circuit switching, packet switching, message switching (1 marks) (1 marks for brief introduction of each techniques)	1marks for each correct row
24	(a) Given is a Python string declaration: title="## T20 W'Cup 2022@@" Write the output of: print(title[::-1]) (b) Write the output of the code given below:	1marks for each correct row

<table>
<tr><td></td><td>my_dict = {"name": "Aman", "age": 26}
my_dict['age'] = 27
my_dict['address'] = "Delhi"
print(my_dict.items())

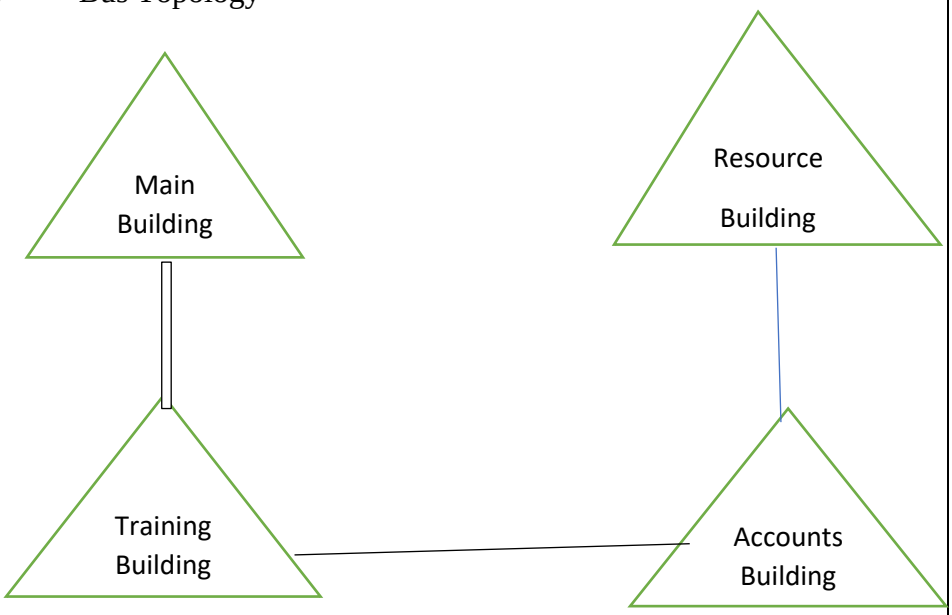
Ans: (a) @@2202 puC'W 02T ## 1 marks for each correct row
(b) Ans: dict_items([('name', 'Aman'), ('age', 27), ('address', 'Delhi')])

(1 mark for the correct answer)</td><td></td></tr>
<tr><td>25</td><td>Differentiate between WHERE and HAVING clause.
Ans : WHERE clause is used to select particular rows that satisfy a condition whereas HAVING is used in connection with aggregate function
for e.g > SELECT * FROM STUDENT GROUP BY STREAM HAVING MAKRS>75 ;
This command will display all student grouped together on the basis of stream only for those students have scored marks more than 75.</td><td>1marks for definition and 1 for example</td></tr>
<tr><td>26</td><td>A.
<table><tr><td>Name</td><td>gname</td></tr><tr><td>Rohan</td><td>Football</td></tr><tr><td>Rohan</td><td>Lawn Tennis</td></tr><tr><td>Jaya</td><td>Football</td></tr><tr><td>Jaya</td><td>Lawn Tennis</td></tr><tr><td>Teena</td><td>Football</td></tr><tr><td>Teena</td><td>Lawn Tennis</td></tr></table>
B. i) 1200000
ii) 4500
iii) 2
iv) All given table data will display.</td><td></td></tr>
<tr><td>27</td><td>def countH( ):
f = open("Para.txt", "r")
lines = 0
l = f.readlines( )
for i in l:
if[0] =='H':
lines+=1
print("No of lines are", lines)
f.close( )
or
def countmy( ):
f = open("DATA.txt", "r")
count= 0
x = f.read( )
word = x.split( )
for i in word:
if(i== "my")
count = count + 1
print("my occurs", count, "Times")</td><td></td></tr>
</table>

	f.close( )	
28.	a) i) **Name** Motherboard Hard Disk LCD ii**) Area Count** CP 2 GK II 1 Nehru Place 2 iii) **Count(Distinct Area)** 3 iv) **Name Price** Motherboard 12000 Motherboard 13000 b) create database employee;	

29.	def is_even_num(l):
	enum = [ ]
	for n in l:
	if n % 2 == 0:
	enum.append(n)
	return enum
	print(is_even_num([1,2,3,4,5,6,7,8,9])	

30.	def Push(stk, item):
	stk.append(item)
	top = len(stk) -1
	
	def Display(stk):
	if isEmpty(stk):
	print(“Stack Empty”)
	else:
	top = len(stk) – 1
	print(stk[top],”top”]
	for a in range (top -1, -l,-1):
	print(stk[a])
	
	or
	
	def MakePush(Package):
	a = int(input(“Enter package title:”))
	Package.append(a)
	def MakePop(Package):
	if (Package===[]):
		3

	print("Stack Empty") else: print("Deleted element:", Package.pop( ))	
	SECTION D	
31	i) Bus Topology  ii) Training Building as its hosts the most computers. iii) Repeater between training and accounts building as they have 110 m of distance. Hub / Switch – In all the building . more than one computers are there iv)Optical Fibre v)FTP (File Transfer Proctocols).	
32.	a) 3 3 3 2 b) i)mycon ii)db.cursor() iii)db.close() or a) SCHOOLbbbbCOM b) i)statement1 – import mysql.connector ii) cursor = db.cursor() **#statement2** **iii)** cursor.execute(sql) **#statement3**	
33.	Import csv Row = ['2','Akshat chuhan', 'commerce','98'] def readscv( ): with open("student.csv", 'r') as f:	

	data = csv.reader(f)
	for row in data:
	print(row)
	
	def writecsv():
	with open("student.csv", 'w', newline='') as fobj;
	csv_w=csv.writer(fobj), deliniter=',')
	
	csv_w.writerow(row)
	or
	difference between text and csv file (1marks)
	def addCsvFile(Username, Password):
	f= open('user.csv','a')
	newFileWriter=csv.writer(f)
	newFileWriter.writerow([username,password])
	f.close( )
	def readCvsFile():
	with open('user.csv','r') as newFile:
	for row in newFileReader:
	print(row[0],row[1])
	newFile.close( )	

	SECTION E	

34.	a. primary key – ItemNo
	b. Degree – 4, Cardinality – 6
	c. i) insert into STORE values(2010,"Note Book",25,50);
	ii)update store set quantity = quantity + 10;
	or
	c. i) delete * from STORE WHERE ItemNo=2005;
	ii) alter table STORE add(price float(5));	

35.	i)statement1 – pickle ii)statement2 – with open("Stu.dat","wb" as fh: iii)statement3 - pickle.dump(Stu1,fh) iv)Rstu= pickle.load(fin)	