Series : %BAB%

SET-4

प्रश्न–पत्र कोड
Q.P. Code **91**

रोल नं.
Roll No.

Candidates must write the Q.P. Code on the title page of the answer-book.

- Please check that this question paper contains **12** printed pages.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains **13** questions.
- **Please write down the Serial Number of the question in the answer-book before attempting it.**
- 15 minutes time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the candidates will read the question paper only and will not write any answer on the answer-book during this period.

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COMPUTER SCIENCE

*Time allowed : **2** hours*

*Maximum Marks : **35***

General Isnstructions :

(i) *This question paper is divided into* ***3 Sections – A, B*** *and* ***C****.*

(ii) ***Section A****, consists of* ***7*** *questions* ***(1-7)****. Each question carries* ***2*** *marks.*

(iii) ***Section B****, consists of* ***3*** *questions* ***(8-10)****. Each question carries* ***3*** *marks.*

(iv) ***Section C****, consists of* ***3*** *questions* ***(11-13)****. Each question carries* ***4*** *marks.*

(v) *Internal choices have been given for question numbers –* ***7, 8*** *and* ***12****.*

SECTION – A

(Each question carries 2 marks)

1. "Stack is a linear data structure which follows a particular order in which the operations are performed." **2**

   What is the order in which the operations are performed in a Stack ?

   Name the List method/function available in Python which is used to remove the last element from a list implemented stack.

   Also write an example using Python statements for removing the last element of the list.

2. (i) Expand the following : **1**

   `VoIP, PPP`

   (ii) Riya wants to transfer pictures from her mobile phone to her laptop. She uses Bluetooth technology to connect two devices. Which type of network (PAN/LAN/MAN/WAN) will be formed in this case ? **1**

3. Differentiate between the terms Attribute and Domain in the context of Relational Data Model. **2**

4. Consider the following SQL table MEMBER in a SQL Database CLUB : **2**

Table : **MEMBER**

M_ID	**NAME**	**ACTIVITY**
M1001	Amina	GYM
M1002	Pratik	GYM
M1003	Simon	SWIMMING
M1004	Rakesh	GYM
M1005	Avneet	SWIMMING

Assume that the required library for establishing the connection between Python and MYSQL is already imported in the given Python code. Also assume that DB is the name of the database connection for table MEMBER stored in the database CLUB.

Predict the output of the following code :

```
MYCUR = DB.cursor()
MYCUR.execute ("USE CLUB")
MYCUR.execute ("SELECT * FROM MEMBER WHERE ACTIVITY= 'GYM'  ")
R=MYCUR.fetchone()
for i in range (2) :
    R=MYCUR.fetchone()
    print (R[0], R[1], sep = "#")
```

5. Write the output of SQL queries (a) to (d) based on the table VACCINATION_DATA given below : **2**

TABLE : **VACCINATION_DATA**

VID	Name	Age	Dose1	Dose2	City
101	Jenny	27	2021-12-25	2022-01-31	Delhi
102	Harjot	55	2021-07-14	2021-10-14	Mumbai
103	Srikanth	43	2021-04-18	2021-07-20	Delhi
104	Gazala	75	2021-07-31	NULL	Kolkata
105	Shiksha	32	2022-01-01	NULL	Mumbai

(a) SELECT Name, Age FROM VACCINATION_DATA
WHERE Dose2 IS NOT NULL AND Age > 40;

(b) SELECT City, COUNT(*) FROM VACCINATION_DATA GROUP BY City;

(c) SELECT DISTINCT City FROM VACCINATION_DATA;

(d) SELECT MAX (Dosel), MIN (Dose2) FROM VACCINATION_DATA;

6. Write the output of SQL queries (a) and (b) based on the following two tables DOCTOR and PATIENT belonging to the same database : **2**

Table : **DOCTOR**

DNO	DNAME	FEES
D1	AMITABH	1500
D2	ANIKET	1000
D3	NIKHIL	1500
D4	ANJANA	1500

Table : **PATIENT**

PNO	PNAME	ADMDATE	DNO
P1	NOOR	2021-12-25	D1
P2	ANNIE	2021-11-20	D2
P3	PRAKASH	2020-12-10	NULL
P4	HARMEET	2019-12-20	D1

(a) SELECT DNAME, PNAME FROM DOCTOR
NATURAL JOIN PATIENT ;

(b) SELECT PNAME, ADMDATE, FEES
FROM PATIENT P, DOCTOR D
WHERE D.DNO = P.DNO AND FEES > 1000;

7. Differentiate between Candidate Key and Primary Key in the context of Relational Database Model. **2**

OR

Consider the following table PLAYER :

Table : **PLAYER**

PNO	NAME	SCORE
P1	RISHABH	52
P2	HUSSAIN	45
P3	ARNOLD	23
P4	ARNAV	18
P5	GURSHARAN	42

(a) Identify and write the name of the most appropriate column from the given table PLAYER that can be used as a Primary key.

(b) Define the term Degree in relational data model. What is the Degree of the given table PLAYER ?

SECTION – B

(Each question carries 3 marks)

8. • Write the definition of a user defined function **PushNV(N)** which accepts a list of strings in the parameter **N** and **pushes** all strings which have no vowels present in it, into a list named **NoVowel**. **3**

• Write a program in Python to input 5 words and **push** them one by one into a list named **All**.

The program should then use the function **PushNV()** to create a stack of words in the list **NoVowel** so that it stores only those words which do not have any vowel present in it, from the list **All**. Thereafter, **pop** each word from the list **NoVowel** and display the popped word. When the stack is empty display the message **"EmptyStack"**.

For example :

If the Words accepted and pushed into the list **All** are

```
['DRY', 'LIKE', 'RHYTHM', 'WORK', 'GYM']
```

Then the stack **NoVowel** should store

['DRY', 'RHYTHM', 'GYM']

And the output should be displayed as

GYM RHYTHM DRY EmptyStack

OR

- Write the definition of a user defined function **Push3_5(N)** which accepts a list of integers in a parameter **N** and **pushes** all those integers which are **divisible by 3 or divisible by 5** from the list **N** into a list named **Only3_5**.
- Write a program in Python to input 5 integers into a list named **NUM**.

  The program should then use the function **Push 3_5()** to create the stack of the list **Only3_5**. Thereafter **pop** each integer from the list **Only3_5** and display the popped value. When the list is empty, display the message **"StackEmpty".**

For example :

If the integers input into the list **NUM** are :

[10, 6, 14, 18, 30]

Then the stack **Only3_5** should store

[10, 6, 18, 30]

And the output should be displayed as

30 18 6 10 StackEmpty

9. (i) A SQL table **ITEMS** contains the following columns : **1**

INO, INAME, QUANTITY, PRICE, DISCOUNT

Write the SQL command to remove the column **DISCOUNT** from the table.

(ii) Categorize the following SQL commands into **DDL** and **DML** : **2**

CREATE, UPDATE, INSERT, DROP

10. Rohan is learning to work upon Relational Database Management System (RDBMS) application. Help him to perform following tasks : **3**

(a) To open the database named **"LIBRARY"**.

(b) To display the names of all the tables stored in the opened database.

(c) To display the structure of the table **"BOOKS"** existing in the already opened database **"LIBRARY"**.

SECTION – C

(Each question carries 4 marks)

11. Write SQL queries for (a) to (d) based on the tables PASSENGER and FLIGHT given below : **4**

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

(a) Write a query to change the fare to 6000 of the flight whose FNO is F104.

(b) Write a query to display the total number of MALE and FEMALE PASSENGERS.

(c) Write a query to display the **NAME**, corresponding **FARE** and **F_DATE** of all PASSENGERS who have a flight to **START** from DELHI.

(d) Write a query to delete the records of flights which end at Mumbai.

12. (i) Differentiate between Bus Topology and Tree Topology. Also, write one advantage of each of them. **2**

OR

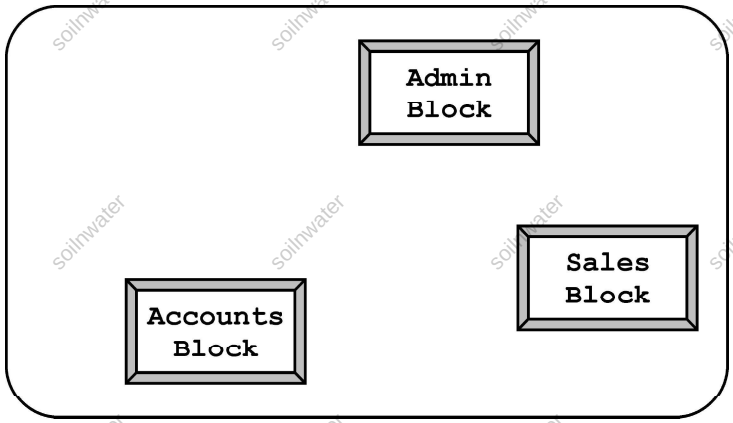
Differentiate between HTML and XML.

(ii) What is a web browser ? Write the names of any two commonly used web browsers. **2**

13. Galaxy Provider Ltd. is planning to connect its office in Texas, USA with its branch at Mumbai. The Mumbai branch has 3 Offices in three blocks located at some distance from each other for different operations – ADMIN, SALES and ACCOUNTS. **4**

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

Layout of the Offices in the Mumbai branch :



Shortest distances between various locations :

ADMIN Block to SALES Block	300 m
SALES Block to ACCOUNTS Block	175 m
ADMIN Block to ACCOUNTS Block	350 m
MUMBAI Branch to TEXAS Head Office	14000 km

Number of Computers installed at various locations are as follows :

ADMIN Block	255
ACCOUNTS Block	75
SALES Block	30
TEXAS Head Office	90

(a) It is observed that there is a huge data loss during the process of data transfer from one block to another. Suggest the most appropriate networking device out of the following, which needs to be placed along the path of the wire connecting one block office with another to refresh the signal and forward it ahead.

(i) MODEM (ii) ETHERNET CARD

(iii) REPEATER (iv) HUB

(b) Which hardware networking device out of the following, will you suggest to connect all the computers within each block ?

(i) SWITCH (ii) MODEM

(iii) REPEATER (iv) ROUTER

(c) Which service/protocol out of the following will be most helpful to conduct live interactions of employees from Mumbai Branch and their counterparts in Texas ?

(i) FTP (ii) PPP

(iii) SMTP (iv) VoIP

(d) Draw the cable layout (block to block) to efficiently connect the three offices of the Mumbai branch.