SET-4

Series %BAB%/C

Q.P. Code 91

Roll No. | | | | | | | | |

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

- Please check that this question paper contains **9** 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 minute 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 students will read the question paper only and will not write any answer on the answer-book during this period.

COMPUTER SCIENCE

Time allowed : 2 hours *Maximum Marks : 35*

General Instructions :

*(i) This question paper is divided into **3** sections – **A**, **B** and **C**.*
*(ii) **Section A**, consists **7** questions (1 – 7). Each question carries **2** marks.*
*(iii) **Section B**, consists **3** questions (8 – 10). Each question carries **3** marks.*
*(iv) **Section C**, consists **3** questions (11 – 13). Each question carries **4** marks.*
*(v) Internal choices have been given for questions number **7**, **8** and **12**.*

SECTION A
(Each question carries 2 marks)

1. Differentiate between Push and Pop operations in the context of stacks. *2*

2. (a) Expand **FTP**. *1*

(b) Out of the following, which has the **largest** network coverage area ? *1*

LAN, MAN, PAN, WAN

3. Differentiate between Degree and Cardinality in the context of Relational Data Model. *2*

4. Consider the following table EMPLOYEE in a Database COMPANY :

Table : EMPLOYEE

E_ID	NAME	DEPT
H1001	Avneet	AC
A1002	Rakesh	HR
A1003	Amina	AC
H1002	Simon	HR
A1004	Pratik	AC

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 the given table EMPLOYEE stored in the database COMPANY.

Predict the output of the following Python code : *2*

```
CUR=DB.cursor()
CUR.execute("USE COMPANY")
CUR.execute("SELECT * FROM EMPLOYEE WHERE DEPT = 'AC' ")
for i in range(2) :
    R=CUR.fetchone()
    print(R[0], R[1], sep ="#")
```

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

Table : TRAVEL

T_ID	START	END	T_DATE	FARE
101	DELHI	CHENNAI	2021-12-25	4500
102	DELHI	BENGALURU	2021-11-20	4000
103	MUMBAI	CHENNAI	2020-12-10	5500
104	DELHI	MUMBAI	2019-12-20	4500
105	MUMBAI	BENGALURU	2022-01-15	5000

(a)
```
SELECT START, END FROM TRAVEL
WHERE FARE <= 4000 ;
```

(b)
```
SELECT T_ID, FARE FROM TRAVEL
WHERE T_DATE LIKE '2021-12-%' ;
```

(c)
```
SELECT T_ID, T_DATE FROM TRAVEL WHERE END = 'CHENNAI'
ORDER BY FARE ;
```

(d)
```
SELECT START, MIN(FARE)
FROM TRAVEL GROUP BY START ;
```

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

Table : FLIGHT

FNO	DEPART	ARRIVE	FARE
F101	DELHI	CHENNAI	4500
F102	DELHI	BENGALURU	4000
F103	MUMBAI	CHENNAI	5500
F104	DELHI	MUMBAI	4500
F105	MUMBAI	BENGALURU	5000

Table : PASSENGER

PNO	NAME	FLIGHTDATE	FNO
P1	PRAKASH	2021-12-25	F101
P2	NOOR	2021-11-20	F103
P3	HARMEET	2020-12-10	NULL
P4	ANNIE	2019-12-20	F105

(a)
```
SELECT NAME, DEPART FROM FLIGHT
NATURAL JOIN PASSENGER ;
```

(b)
```
SELECT NAME, FARE
FROM PASSENGER P, FLIGHT F
WHERE F.FNO = P.FNO AND F.DEPART = 'MUMBAI' ;
```

7. (a) Explain Primary Key in the context of Relational Database Model. Support your answer with suitable example. *2*

OR

(b) Consider the following table BATSMEN :

Table : BATSMEN

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

(i) Identify and write the name of the Candidate Keys in the given table BATSMEN.

(ii) How many tuples are there in the given table BATSMEN ? *2*

SECTION B

(Each question carries 3 marks)

8. (a) Write separate user defined functions for the following : *3*

(i) **PUSH(N)** – This function accepts a list of names, **N** as parameter. It then pushes only those names in the stack named **OnlyA** which contain the letter **'A'**.

(ii) **POPA(OnlyA)** – This function pops each name from the stack **OnlyA** and displays it. When the stack is empty, the message **"EMPTY"** is displayed.

For example :

If the names in the list **N** are

```
['ANKITA', 'NITISH', 'ANWAR', 'DIMPLE', 'HARKIRAT']
```

Then the stack **OnlyA** should store

```
['ANKITA', 'ANWAR', 'HARKIRAT']
```

And the output should be displayed as

```
HARKIRAT ANWAR ANKITA EMPTY
```

OR

(b) Write the following user defined functions : *3*

(i) **pushEven(N)** – This function accepts a list of integers named **N** as parameter. It then pushes only even numbers into the stack named **EVEN**.

(ii) **popEven(EVEN)** – This function pops each integer from the stack **EVEN** and displays the popped value. When the stack is empty, the message **"Stack Empty"** is displayed.

For example :

If the list **N** contains
```
[10,5,3,8,15,4]
```
Then the stack, **EVEN** should store
```
[10,8,4]
```
And the output should be
```
4 8 10 Stack Empty
```

9. (a) A SQL table **BOOKS** contains the following column names :

BOOKNO, BOOKNAME, QUANTITY, PRICE, AUTHOR

Write the SQL statement to add a new column **REVIEW** to store the reviews of the book. *1*

(b) Write the names of any two commands of **DDL** and any two commands of **DML** in SQL. *2*

10. Rashmi has forgotten the names of the databases, tables and the structure of the tables that she had created in Relational Database Management System (RDBMS) on her computer.

(a) Write the SQL statement to display the names of all the databases present in RDBMS application on her computer.

(b) Write the statement which she should execute to open the database named "**STOCK**".

(c) Write the statement which she should execute to display the structure of the table "**ITEMS**" existing in the above opened database "**STOCK**". *3*

SECTION C

(Each question carries 4 marks)

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

Table : CUSTOMER

CNO	NAME	GENDER	ADDRESS	PHONE
1001	Suresh	MALE	A-123, West Street	9310010010
1002	Anita	FEMALE	C-24, Court Lane	9121211212
1003	Harjas	MALE	T-1, Woods Avenue	9820021001

Table : TRANSACT

TNO	CNO	AMOUNT	TTYPE	TDATE
T1	1002	2000	DEBIT	2021-09-25
T2	1003	1500	CREDIT	2022-01-28
T3	1002	3500	CREDIT	2021-12-31
T4	1001	1000	DEBIT	2022-01-10

(a) Write the SQL statements to delete the records from table TRANSACT whose amount is less than 1000.

(b) Write a query to display the total **AMOUNT** of all **DEBITs** and all **CREDITs**.

(c) Write a query to display the **NAME** and corresponding **AMOUNT** of all **CUSTOMERs** who made a transaction type **(TTYPE)** of **CREDIT**.

(d) Write the SQL statement to change the Phone number of customer whose CNO is 1002 to 9988117700 in the table CUSTOMER.

12. (a) (i) Mention any two characteristics of BUS Topology. *2*

OR

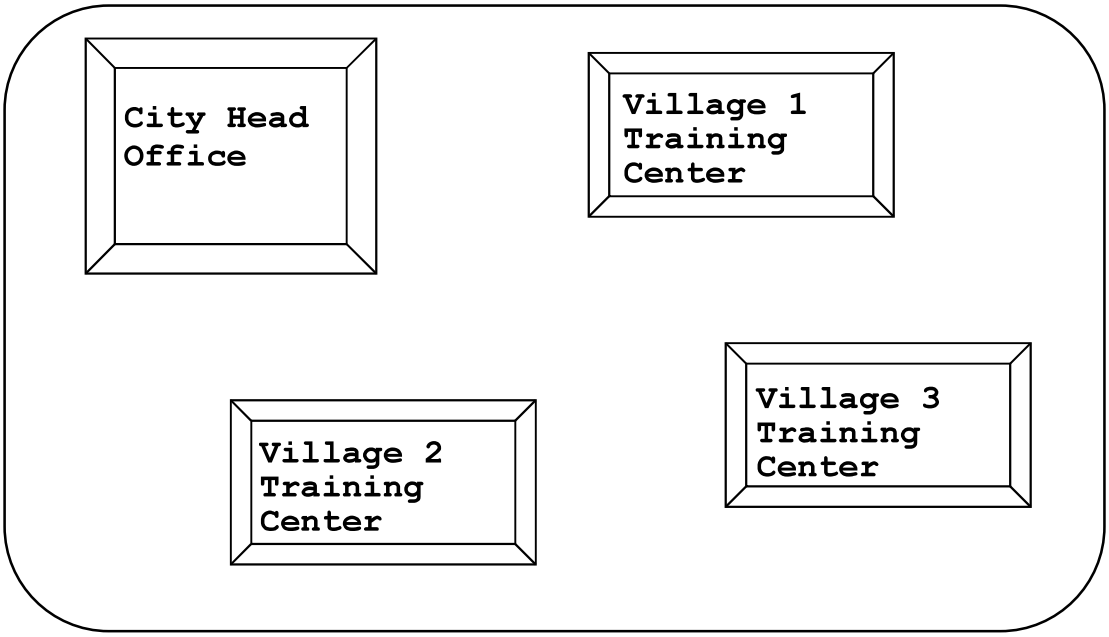
(ii) Differentiate between the terms Domain Name and URL in the context of World Wide Web. *2*

(b) Write the names of two wired and two wireless data transmission mediums. *2*

13. The government has planned to develop digital awareness in the rural areas of the nation. According to the plan, an initiative is taken to set up Digital Training Centers in villages across the country with its Head Office in the nearest cities. The committee has hired a networking consultancy to create a model of the network in which each City Head Office is connected to the Training Centers situated in 3 nearby villages.

As a network expert in the consultancy, you have to suggest the best network-related solutions for the issues/problems raised in (a) to (d), keeping in mind the distance between various locations and other given parameters. *4*

Layout of the City Head Office and Village Training Centers :



Shortest distances between various Centers :

Village 1 Training Center to City Head Office	2 KM
Village 2 Training Center to City Head Office	1·5 KM
Village 3 Training Center to City Head Office	3 KM
Village 1 Training Center to Village 2 Training Center	3·5 KM
Village 1 Training Center to Village 3 Training Center	4·5 KM
Village 2 Training Center to Village 3 Training Center	3·5 KM

Number of Computers installed at various centers are as follows :

Village 1 Training Center	10
Village 2 Training Center	15
Village 3 Training Center	15
City Head Office	100

(a) It is observed that there is a huge data loss during the process of data transfer from one village 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 village with another to refresh the signal and forward it ahead.

(i) MODEM

(ii) ETHERNET CARD

(iii) REPEATER

(iv) HUB

(b) Draw the cable layout (location-to-location) to efficiently connect various Village Training Centers and the City Head Office for the above shown layout.

(c) Which hardware networking device, out of the following, will you suggest to connect all the computers within the premises of every Village Training Center ?

(i) SWITCH

(ii) MODEM

(iii) REPEATER

(iv) ROUTER

(d) Which protocol, out of the following, will be most helpful to conduct online interactions of Experts from the City Head Office and people at the three Village Training Centers ?

(i) FTP

(ii) PPP

(iii) SMTP

(iv) VoIP