



Series : WXYZ/S

Set – 4

**प्रश्न-पत्र कोड
Q.P. Code**

91/S

रोल नं.

Roll No.

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परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें।

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

कम्प्यूटर साइंस COMPUTER SCIENCE

निर्धारित समय : 3 घण्टे



अधिकतम अंक : 70

Time allowed : 3 hours

Maximum Marks : 70

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ **27** हैं।
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में **37** प्रश्न हैं।
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।
- **कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में यथा स्थान पर प्रश्न का क्रमांक अवश्य लिखें।**
- इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा। 10.15 बजे से 10.30 बजे तक परीक्षार्थी केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।
- Please check that this question paper contains **27** printed pages.
- Please check that this question paper contains **37** questions.
- 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 write down the Serial Number of the question in the answer-book at the given place 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 candidates will read the question paper only and will not write any answer on the answer-book during this period.



General Instructions :

- (i) This question paper contains **37** questions.
- (ii) **All** questions are **compulsory**. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
- (iii) The paper is divided into **5** Sections – **A, B, C, D** and **E**.
- (iv) **Section A**, consists of **21** questions (**1 to 21**). Each question carries **1** mark.
- (v) **Section B**, consists of **7** questions (**22 to 28**). Each question carries **2** marks.
- (vi) **Section C**, consists of **3** questions (**29 to 31**). Each question carries **3** marks.
- (vii) **Section D**, consists of **4** questions (**32 to 35**). Each question carries **4** marks.
- (viii) **Section E**, consists of **2** questions (**36 to 37**). Each question carries **5** marks.
- (ix) All programming questions are to be answered using Python Language only.
- (x) In case of MCQs, text of the correct answer should also be written.

SECTION A

21×1= 21

1. State if following statement is True or False :
If **T** is a tuple and **L** is a list, then **T+L** is a valid statement in Python. 1
2. Identify the output of the following code segment : 1

```
s = "an apple. a toy."
s=s.find('a',2)
print(s)
```

(A) 0 (B) 1
(C) 3 (D) 'a'
3. What is the value of the following expression ? 1
 $3 + 3 \cdot 00, 3 ** 3 \cdot 0$

(A) [6.0, 27.0] (B) (6.0, 9.0)
(C) (6, 27) (D) (6.0, 27.0)
4. What is the output of the following expression ? 1

```
Sports="Paralympic Games"
print (Sports.split("m"))
```

(A) ['Paraly', 'm', 'pic Ga', 'm', 'es']
(B) ('Paraly', 'm', 'pic Games')
(C) ('Paraly', 'pic Ga', 'es')
(D) ['Paraly', 'pic Ga', 'es']



5. What will be the output of the following code segment ? 1
`p=list("Session 2024-25")`
`print(p[10:20:])`
6. Which of the following is a mapped data type ? 1
(A) List (B) Sets
(C) Dictionary (D) Boolean
7. If the dictionary D1 is defined as : 1
`D1={1: 'a' ,2: 'b' }`
then which of the following statements is *incorrect* and hence will result in an error ?
(A) `D1.get(1)` (B) `D1.get(3)`
(C) `D1.del(1)` (D) `D1.clear()`
8. Which of the following list methods accepts exactly 2 parameters ? 1
(A) `append()` (B) `extend()`
(C) `insert()` (D) `pop()`
9. In a particular examination, there are 50 candidates with roll numbers from 997601 to 997650. The data of these candidates is stored in a table in a database. What is the domain of the column which stores the roll numbers of the candidates ? 1
10. A text file `song.txt` contains the following contents in it : 1
Life goes on as it never ends
What will be the output of the following code snippet ?
`f1=open("song.txt","r")`
`s1=f1.read(5)`
`s2=f1.readline(4)`
`s3=f1.read(3)`
`print(s1,s3,sep="#")`
(A) `goes# on` (B) `Life #goes# on`
(C) `Life # on` (D) `Error`
11. State whether the following statement is True or False.
In Python, the `print()` evaluates the expression before displaying it on the screen. 1



12. What will be the output of the following code segment ? 1
- ```
a=5
def func_1(b=10):
 global a
 a=b-10
 b+=a
 print(a,b)
func_1(a)
```
- (A) 0 5 (B) 5 0  
(C) 0 -5 (D) -5 0
13. Write any two DDL commands. 1
14. Which of the following is **not** a valid relational operator used with WHERE clause in SQL ? 1
- (A) > (B) <=  
(C) => (D) <>
15. What is the default format of date in MySQL ? 1
- (A) DD-MM-YYYY (B) MM-DD-YYYY  
(C) YYYY-MM-DD (D) YYYY-DD-MM
16. Ginni has created a table, **SCORES** in MySQL to store runs scored by players in a cricket match. The table contains the following records : 1

**Table : Scores**

| PLAYER  | SCORE |
|---------|-------|
| Ranveer | 50    |
| Sukesh  | 35    |
| Mirza   | 10    |
| John    | 51    |
| Murugan | 70    |

Which of the following statements will give 10 as output ?

- (A) **SELECT MAX(Score) FROM Scores;**  
(B) **SELECT MIN(Score) FROM Scores;**  
(C) **SELECT SUM(Score) FROM Scores;**  
(D) **SELECT AVG(Score) FROM Scores;**



17. Which of the following devices is essential to set up a wired LAN ? 1  
(A) Modem (B) NIC  
(C) Repeater (D) Firewall
18. Which network device serves as the entry and exit point of a network, as all data coming in or going out of a network must first pass through it ? 1  
(A) Modem (B) Gateway  
(C) Switch (D) Repeater
19. Which of the following IP addresses is valid ? 1  
(A) 122.94.96.212 (B) 212.254.258.210  
(C) 210.10.12.156.209 (D) 122.294.56.68

Questions 20 and 21 are Assertion (A) and Reason (R) based questions. Mark the correct choice as :

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).  
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of the Assertion (A).  
(C) Assertion (A) is true, but Reason (R) is false.  
(D) Assertion (A) is false, but Reason (R) is true.
20. Assertion (A) : Every object in Python is assigned a unique identity (ID).  
Reason (R) : ID remains the same for the lifetime of that object. 1
21. Assertion (A) : Foreign key column of a table cannot have **NULL** entries.  
Reason (R) : Primary key column of a table cannot have **NULL** entries. 1

## SECTION B

22. What is the difference between = and == in Python ? Give an example of each. 2
23. Give an example of each of the following : 2  
(i) An expression using any one identity operator.  
(ii) An arithmetic expression which uses any one augmented assignment operator.



24. Assuming that **D1** and **D2** are Python dictionaries, write the following statements using built-in functions/methods : 2

(I) (a) To delete all the elements of **D1**.

**OR**

(b) To generate a list of values of **D1**.

(II) (a) To update dictionary **D2** with the elements of **D1**.

**OR**

(b) To generate a tuple of keys of **D2**.

25. Identify the correct possible output(s) of the following code segment. Also write the minimum and the maximum possible values of the variable **b**. 2

```
import random
s="War and Peace"
a=len(s)//2
for i in range(4):
 b=random.randrange(i,a)
 print(s[b],end='')
```

- (A) n+P+d+a+ (B) W+r+n+n+  
(C) e+r+W+a+ (D) a+P+e+r+

26. The code provided below is intended to input a positive integer from the user and display the total number of its factors. However, there are syntax and logical errors in the code. Rewrite the code after removing all the errors. Underline all the corrections made. 2

```
n=int(input("Enter a positive integer:"))
c=0
for i in range(n+1):
 if n%i=0:
 c+=1
print(c)
```

27. (I) (a) Write any one difference between CHAR and VARCHAR data types in MySQL. 1

**OR**

(b) Write one difference between Primary key and Unique constraint.



- (II) (a) Write an SQL command to remove a column named ADDRESS, from a table named CUSTOMER. 1

**OR**

- (b) Write an SQL command to add a column named ADDRESS, of type VARCHAR(20) in a table named CUSTOMER.

28. (I) (a) Expand the following terms :

POP, TCP

- (b) Write any one difference between a hub and a switch used in computer networks. 2

**OR**

- (II) (a) Write any one difference between HTTP and HTTPS.

- (b) Write names of any two wireless transmission media.

### SECTION C

29. (a) Write a Python function that displays all the lines ending with a dot (.) from a text file "Colors.txt". For example, if the file contains : 3

*White is a mix of seven colors.*

*What are these seven colors ?*

*VIBGYOR – violet, indigo, blue, green, orange and red.*

*When we mix all these colors we just get one light which is the WHITE light.*

Then the output should be :

*White is a mix of seven colors.*

*VIBGYOR – violet, indigo, blue, green, orange and red.*

*which is the WHITE light.*

(Hint : You will have to ignore trailing white spaces to check the last character)

**OR**

- (b) Write a function in Python to display the line which has the maximum number of vowels from a text file, "Novel.txt".



30. (a) A stack named **KeyStack** contains records of some computer keyboards. Each record is represented as a list containing **Make**, **Keys**, **Connectivity**. The **Make** and **Connectivity** are strings, and **Keys** is an integer. For example, a record in the stack may be ('Hitech', 105, 'USB').

Write the following user-defined functions in Python to perform the specified operations on **KeyStack** : 3×1=3

- (I) **push\_key(KeyStack, new\_key)**: This function takes the stack **KeyStack** and a new record **new\_key** as arguments and pushes this new record onto the stack.
- (II) **pop\_key(KeyStack)**: This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display the message “Underflow”.
- (III) **isEmpty(KeyStack)**: This function checks whether the stack is empty. If the stack is empty, the function should return True, otherwise the function should return False.

**OR**

- (b) Write the following user-defined functions in Python :

- (I) **push\_vowels(S, St)**: Here **S** is a string and **St** is a list representing a stack. The function should push all the vowels of the string **S** onto the stack **St**. For example, if the string **S** is "Easy Concepts", then the function **push\_vowels()** should push the elements 'E', 'a', 'o', 'e' onto the stack.
- (II) **pop\_one(St)** : The function should pop an element from the stack **St**, and return this element. If the stack is empty, then the function should display the message 'Stack Underflow', and return None.
- (III) **display\_all(St)**: The function should display all the elements of the stack **St**, without deleting them. If the stack is empty, the function should display the message 'Empty Stack'.





31. (a) Write the output on execution of the following Python code : 3

```
P=[3,5,7,4]
P.insert(2,3)
P.extend([10, 6])
print(P)
print(P.index(7))
print(P[::2])
```

OR

(b) Write the output on execution of the following Python code :

```
def ALTER(Y=25):
 global X
 Y += X
 X += Y
 print(X,Y,sep="#")
X=5; Y=15
ALTER(Y)
ALTER()
print(X,Y,sep="@")
```

### SECTION D

32. Consider the table **STAFF** given below :

Table : **STAFF**

| STAFF_ID | STAFF_NAME | SALARY | DEPARTMENT | DESIGNATION |
|----------|------------|--------|------------|-------------|
| S101     | SUNITA     | 26000  | MATHS      | TGT         |
| S201     | SUNIL      | 80000  | COMMERCE   | PGT         |
| S301     | NEHA       | 35000  | SCIENCE    | TGT         |
| S102     | MANJEET    | 25000  | MATHS      | TGT         |
| S202     | MANNAN     | 45000  | COMPUTER   | TGT         |



(a) Write the suitable SQL queries to perform the following tasks :  $4 \times 1 = 4$

(I) To display the average salary of each department.

(II) To insert the following record in the table, **STAFF**.

**STAFF\_ID** : **S333**  
**STAFF\_NAME** : **GURMEET**  
**SALARY** : **15000**  
**DEPARTMENT** : **ADMIN**  
**DESIGNATION** : **CLERK**

(III) To display the unique designations from the table.

(IV) To display all the details of the staff whose name is of four letters.

**OR**

(b) Write the output for the queries given below :

(I) **SELECT STAFF\_NAME FROM STAFF**

**WHERE SALARY BETWEEN 25000 AND 30000;**

(II) **SELECT \* FROM STAFF WHERE DEPARTMENT =**

**"MATHS" AND SALARY > 25000;**

(III) **SELECT STAFF\_NAME, STAFF\_ID FROM STAFF WHERE**  
**DEPARTMENT LIKE "%S";**

(IV) **SELECT MAX(SALARY) FROM STAFF;**

**33.** Suman is an intern at a software startup. The company has assigned her a task to create a CSV file named **CLUB.CSV**, to store the records of the Club members. After discussing with Club Incharge, Suman has planned to store the following content of members in the file **CLUB.CSV** :

**[Mno, Name, Mobile, Fee]**

Where

**Mno** – Member Number

**Name** – Name of the Member

**Mobile** – Member's Mobile Number

**Fee** – Fee amount



Assuming you are asked to help Suman in her assignment, write a Python code for performing the following tasks with the help of user-defined functions :

4

**NewMembers()** : to accept records of members from the user and add them to the file **CLUB.CSV**.

**PriorityMember()** : to find and display those members from the file **CLUB.CSV**, who are paying Fee more than 35000.

34. Assume that you are working for ABC Corporation (ABCC). ABCC allots contracts to different contractors for some of its works. The data of Contracts and Contractors are kept in the tables **Work** and **Contractor** respectively. Following are a few records from these two tables of ABCC's database.

Table : **Work**

| W_ID  | C_ID | W_Name     | W_Amt |
|-------|------|------------|-------|
| P0001 | C_01 | Painting   | 20000 |
| E0001 | C_01 | Electrical | 50000 |
| D0001 | C_02 | Dumping    | 10000 |

Table : **Contractor**

| C_ID | C_Name            | Phone   | email       |
|------|-------------------|---------|-------------|
| C_01 | M. Khan & Sons    | 1232311 | MK@xyz.com  |
| C_02 | Acharya Pvt. Ltd. | 2323311 | APL@xyz.com |
| C_03 | Charu Corp.       | NULL    | CCP@pqr.xyz |

Note : The tables contain many more records than shown here.

As an employee of ABCC, you are required to write the SQL queries for the following : 4×1=4

- (I) To display all the records from the **Work** table in alphabetical order of W\_Name.
- (II) To display the names of contractors where W\_Amt is more than 15000.
- (III) To display the structure of **Work** table.
- (IV) (a) To count total number of records present in Work table.

**OR**

- (b) To delete the records of contractors whose phone number is not known.



35. Nutan Kumar is using Python connectivity with MySQL for maintaining data for a table named **MEDICINES** in a database **PHARMACY**. The table has the following attributes :

- **MId** (Medicine number) – string
- **Mname** (Medicine Name) – string
- **Expiry** (Expiry Date) – Date
- **Status** (Active/Discard) – string

Consider the following to establish connectivity between Python and MySQL :

- **Username** – root
- **Password** – tiger
- **Host** – localhost

Help Nutan to write the definition of a user-defined function named **ChangeStatus()** in Python to change the Status of the Medicines whose **Expiry** is before '2022-12-31' as 'DISCARD'.

4

## SECTION E

36. Keshav is the IT Head in a hospital. He needs to manage the records of all the doctors in the hospital. For this, he wants to store the following information of each doctor in a file :

- D\_ID** – An integer to store Doctor ID.
- D\_Name** – A string to store doctor's name.
- D\_Dept** – A string to store the Department of the doctor.  
(Surgery, Radiology, etc.)

**Experience** – An integer to store doctor's experience (in years)

For example, a doctor's information may be :

[1256, 'R. Gupta', 'Cardiology', 15]

As an applicant for the post of a Programmer, you have to answer the following questions in this context :

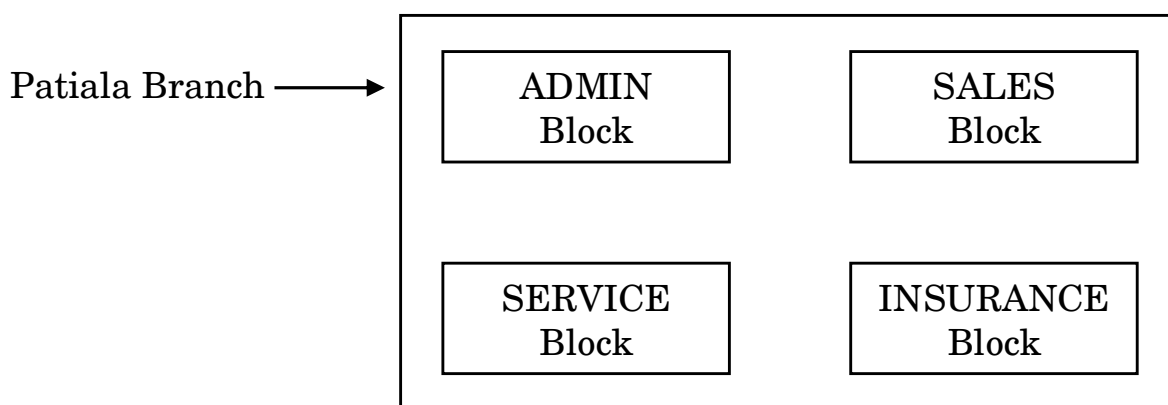
1+2+2=5

- (I) Write one difference of storing this data in a binary file over a CSV file.



- (II) Assume that the data is stored in a binary file, named **DOCTORS.DAT**, and each record is stored as a list. Write a function, in Python, to read and display all the records from the file **DOCTORS.DAT**.
- (III) Write a function **addDoctor()**, in Python, which accepts a doctor's data from the user and writes it in the file **DOCTORS.DAT**.

37. 'CKNG Auto' is a big car-selling agency having its Head Office in Delhi. It is planning to set up a new branch in Patiala. The Patiala branch will have four blocks – ADMIN, SALES, SERVICE and INSURANCE. You, as a network expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in points (I) to (V), keeping the following parameters in mind. 5×1=5



Block to Block distances (in Metres)

| From    | To        | Distance |
|---------|-----------|----------|
| ADMIN   | SALES     | 70 m     |
| ADMIN   | SERVICE   | 60 m     |
| ADMIN   | INSURANCE | 65 m     |
| SALES   | SERVICE   | 80 m     |
| SALES   | INSURANCE | 100 m    |
| SERVICE | INSURANCE | 60 m     |

Distance of Delhi Head Office from Patiala branch = 250 km



Number of computers in each block is as follows :

| Block     | No. of Computers |
|-----------|------------------|
| ADMIN     | 18               |
| SALES     | 30               |
| SERVICE   | 20               |
| INSURANCE | 10               |

- (I) Suggest the most appropriate location of the server inside the Patiala branch. Justify your choice.
- (II) What kind of network (PAN/LAN/MAN/WAN) will be formed by interconnecting all the computers inside a block ?
- (III) Draw the most effective cable layout to connect all four blocks of Patiala branch.
- (IV) Which device should be used to provide Internet connection to all the computers in the Patiala branch ?
- (V) (a) Which is the best wired medium to connect server of Patiala office to the head office at Delhi ?

**OR**

- (b) Is there a need for repeater(s) in Patiala branch ? Why, or why not ?