Series : ZYW1X

रोल नं.
Roll No.

2	3	7	2	5	5	3	3

SET – 4

प्रश्न-पत्र कोड Q.P. Code	91

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
Time allowed : 3 hours

अधिकतम अंक : 70
Maximum Marks : 70

- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ **31** 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 **31** 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 & 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 True or False : 1

"A Python List must always contain all its elements of same data type."

2. What will be the output of the following statement ? 1

```
print(14%3**2*4)
```

(A) 16 (B) 64

(C) 20 (D) 256

3. Identify the correct output of the following code snippet : 1

```
game="Olympic2024"
print(game.index("C"))
```

(A) `0` (B) `6`

(C) `-1` (D) `ValueError`

4. Which of the following is the correct identifier ? 1

(A) `global` (B) `Break`

(C) `def` (D) `with`

5. Identify the invalid Python statement out of the following options : 1

(A) `print("A",10,end="*")` (B) `print("A",sep="*",10)`

(C) `print("A",10,sep="*")` (D) `print("A"*10)`

6. Consider the statements given below and then choose the correct output from the given options : 1

```
L=['TIC', 'TAC']
print(L[::-1])
```

(A) `['CIT', 'CAT']` (B) `['TIC', 'TAC']`

(C) `['CAT', 'CIT']` (D) `['TAC', 'TIC']`

7. Which of the following operator evaluates to **True** if the variable on either side of the operator points towards the same memory location and **False** otherwise ? 1

(A) `is` (B) `is not`

(C) `and` (D) `or`

8. Consider the statements given below and then choose the correct output from the given options : 1

```
D={'S01':95, 'S02':96 }
for I in D :
    print(I,end='#')
```

(A) S01#S02# (B) 95#96#

(C) S01,95#S02,96# (D) S01#95#S02#96#

9. While creating a table, which constraint does not allow insertion of duplicate values in the table ? 1

(A) UNIQUE (B) DISTINCT

(C) NOT NULL (D) HAVING

10. Consider the statements given below and then choose the correct output from the given options : 1

```
def Change(N) :
    N=N+10
    print(N,end='$$')
N=15
Change(N)
print(N)
```

(A) 25$$15 (B) 15$$25

(C) 25$$25 (D) 2525$$

11. Consider the statements given below and then choose the correct output from the given options : 1

```
N='5'
try:
    print('WORD' + N, end='#')
except:
    print('ERROR',end='#')
finally:
    print('OVER')
```

(A) ERROR# (B) WORD5#OVER

(C) WORD5# (D) ERROR#OVER

12. Which of the following built-in function/method returns a dictionary ? 1

(A) `dict()`
(B) `keys()`
(C) `values()`
(D) `items()`

13. Which of the following is a DML command in SQL ? 1

(A) `UPDATE`
(B) `CREATE`
(C) `ALTER`
(D) `DROP`

14. Which aggregate function in SQL displays the number of values in the specified column ignoring the NULL values ? 1

(A) `len()`
(B) `count()`
(C) `number()`
(D) `num()`

15. In MYSQL, which type of value should not be enclosed within quotation marks ? 1

(A) `DATE`
(B) `VARCHAR`
(C) `FLOAT`
(D) `CHAR`

16. State True or False : 1

If table **A** has 6 rows and 3 columns, and table **B** has 5 rows and 2 columns, the Cartesian product of **A** and **B** will have 30 rows and 5 columns.

17. Which of the following networking devices is used to regenerate and transmit the weakened signal ahead ? 1

(A) Hub
(B) Ethernet Card
(C) Repeater
(D) Modem

18. Which of the following options is the correct protocol used for phone calls over the internet ? 1

(A) PPP
(B) FTP
(C) HTTP
(D) VoIP

19. Expand ARPANET. 1

Q. Nos. **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 for Assertion (A).

(B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation for 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)** : For a binary file opened using `'rb'` mode, the `pickle.dump()` method will display an error. 1

Reason (R) : The `pickle.dump()` method is used to read from a binary file.

21. **Assertion (A)** : We can retrieve records from more than one table in MYSQL. 1

Reason (R) : Foreign key is used to establish a relationship between two tables.

SECTION – B (7 × 2 = 14)

22. What does the `return` statement do in a function ? Explain with the help of an example. 2

23. Write one example of each of the following in Python : 2

(i) Syntax Error

(ii) Implicit Type Conversion

24. Consider the following dictionaries, D and D1 : 2

```
D={"Suman": 40, "Raj":55, "Raman":60}
D1={"Aditi":30, "Amit":90,"Raj":20}
```

(Answer using built-in Python functions only)

(i) (a) Write a statement to display/return the value corresponding to the key `"Raj"` in the dictionary `D`.

OR

(b) Write a statement to display the length of the dictionary `D1`.

(ii) (a) Write a statement to append all the key-value pairs of the dictionary `D` to the dictionary `D1`.

OR

(b) Write a statement to delete the item with the given key `"Amit"` from the dictionary `D1`.

25. What possible output from the given options is expected to be displayed when the following code is executed ? 2

```
import random
Cards=["Heart","Spade","Club","Diamond"]
for i in range(2):
    print(Cards[random.randint(1,i+2)],end="#")
```

(A) `Spade#Diamond#` (B) `Spade#Heart#`

(C) `Diamond#Club#` (D) `Heart#Spade#`

26. The code given below accepts N as an integer argument and returns the sum of all integers from 1 to N. Observe the following code carefully and rewrite it after removing all syntax and logical errors. Underline all the corrections made. 2

```
def Sum(N)
    for I in range(N):
        S=S+I
    return S
print(Sum(10)
```

27. Nisha is assigned the task of maintaining the staff data of an organization. She has to store the details of the staff in the SQL table named **EMPLOYEES** with attributes as **EMPNO**, **NAME**, **DEPARTMENT**, **BASICSAL** to store Employee's Identification Number, Name, Department, and Basic Salary respectively. There can be two or more Employees with the same name in the organization. 2

(i) (a) Help Nisha to identify the attribute which should be designated as the PRIMARY KEY. Justify your answer.

OR

(b) Help Nisha to identify the constraint which should be applied to the attribute **NAME** such that the Employees' Names cannot be left empty or **NULL** while entering the records but can have duplicate values.

(ii) (a) Write the SQL command to change the size of the attribute **BASICSAL** in the table **EMPLOYEES** to allow the maximum value of **99999.99** to be stored in it.

OR

(b) Write the SQL command to delete the table **EMPLOYEES**.

28. (a) Expand and explain the term URL. 2

OR

(b) Expand the term PPP. What is the use of PPP ?

SECTION – C

(3 × 3 = 9)

29. (a) Write a Python function that displays all the lines containing the word `'vote'` from a text file `"Elections.txt"`. For example, if the file contains : **3**

In an election many people vote to choose their representative.
The candidate getting the maximum share of votes stands elected.
Normally, one person has to vote once.
The process of voting may vary with time and region.

Then the output should be :

In an election many people vote to choose their representative.
Normally, one person has to vote once.

OR

(b) Write a Python function that displays all the words starting and ending with a vowel from a text file `"Report.txt"`. The consecutive words should be separated by a space in the output. For example, if the file contains :

Once there was a wise man in a village.
He was an awesome story-teller.
He was able to keep people anchored while listening to him.

Then the output should be :

Once a a awesome able

30. (a) A stack, named `ClrStack`, contains records of some colors. Each record is represented as a tuple containing four elements – `ColorName`, `RED`, `GREEN`, `BLUE`. `ColorName` is a string, and `RED`, `GREEN`, `BLUE` are integers. For example, a record in the stack may be `('Yellow', 237, 250, 68)` **3 × 1 = 3**

Write the following user-defined functions in Python to perform the specified operations on `ClrStack`:

(i) `push_Clr(ClrStack, new_Clr)` : This function takes the stack `ClrStack` and a new record `new_Clr` as arguments and pushes this new record onto the stack.

(ii) `pop_Clr(ClrStack)` : 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(ClrStack)` : 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_trail(N,myStack)** : Here **N** and **mystack** are lists, and **myStack** represents a stack. The function should push the last 5 elements from the list **N** onto the stack **myStack**. For example, if the list **N** is **[1,2,3,4,5,6,7]**, then the function **push_trail()** should push the elements **3,4,5,6,7** onto the stack. Therefore the value of stack will be **[3,4,5,6,7]**.

Assume that **N** contains at least 5 elements.

(ii) **pop_one(myStack)** : The function should pop an element from the stack **myStack**, and return this element. If the stack is empty, then the function should display the message **'Stack Underflow'**, and return **None**.

(iii) **display_all(myStack)** : The function should display all the elements of the stack **myStack**, without deleting them. If the stack is empty, the function should display the message **'Empty Stack'**.

31. (a) Predict the output of the following code : 3

```
def ExamOn(mystr) :
    newstr = ""
    count = 0
    for i in mystr:
        if count%2 != 0:
            newstr = newstr + str(count-1)
        else:
            newstr = newstr + i.lower()
        count += 1
    newstr = newstr + mystr[:2]
    print("The new string is:", newstr)
ExamOn("GenX")
```

OR

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

```
def Change(X):
    for K,V in X.items():
    L1.append(K)
    L2.append(V)
D={1:"ONE",2:"TWO",3:"THREE"}
L1=[]
L2=[]
Change(D)
print(L1)
print(L2)
print(D)
```

SECTION – D

(4 × 4 = 16)

32. Suman has created a table named **WORKER** with a set of records to maintain the data of the construction sites, which consists of **WID**, **WNAME**, **WAGE**, **HOURS**, **TYPE**, and **SITEID**. After creating the table, she entered data in it, which is as follows : **4**

WID	WNAME	WAGE	HOURS	TYPE	SITEID
W01	Ahmed J	1500	200	Unskilled	103
W11	Naveen S	520	100	Skilled	101
W02	Jacob B	780	95	Unskilled	101
W15	Nihal K	560	110	Semiskilled	NULL
W10	Anju S	1200	130	Skilled	103

(a) Based on the data given above, answer the following questions :

(i) Write the SQL statement to display the names and wages of those workers whose wages are between **800** and **1500**.

(ii) Write the SQL statement to display the record of workers whose **SITEID** is not known.

(iii) Write the SQL statement to display **WNAME**, **WAGE** and **HOURS** of all those workers whose **TYPE** is **'Skilled'**.

(iv) Write the SQL statement to change the **WAGE** to 1200 of the workers where the **TYPE** is **"Semiskilled"**.

OR

(b) Considering the above given table **WORKER**, write the output on execution of the following SQL commands :

(i)
```
SELECT WNAME, WAGE*HOURS FROM WORKER WHERE
SITEID = 103;
```

(ii)
```
SELECT COUNT (DISTINCT TYPE) FROM WORKER;
```

(iii)
```
SELECT MAX(WAGE), MIN(WAGE), TYPE FROM WORKER
GROUP BY TYPE;
```

(iv)
```
SELECT WNAME,SITEID FROM WORKER WHERE
TYPE="Unskilled" ORDER BY HOURS;
```

33. A csv file **"P_record.csv"** contains the records of patients in a hospital. Each record of the file contains the following data : **4**

- Name of a patient
- Disease
- Number of days patient is admitted
- Amount

For example, a sample record of the file may be :

["Gunjan","Jaundice",4,15000]

Write the following Python functions to perform the specified operations on this file :

(i) Write a function **read_data()** which reads all the data from the file and displays the details of all the **'Cancer'** patients.

(ii) Write a function **count_rec()** which counts and returns the number of records in the file.

34. Assume that you are working in the IT Department of a Creative Art Gallery (CAG), which sells different forms of art creations like Paintings, Sculptures etc. The data of Art Creations and Artists are kept in tables **Articles** and **Artists** respectively. Following are few records from these two tables : $4 \times 1 = 4$

Table : Articles

Code	A_Code	Article	DOC	Price
PL001	A0001	Painting	2018-10-19	20000
SC028	A0004	Sculpture	2021-01-15	16000
QL005	A0003	Quilling	2024-04-24	3000

Table : Artists

A_Code	Name	Phone	Email	DOB
A0001	Roy	595923	r@CrAG.com	1986-10-12
A0002	Ghosh	1122334	ghosh@CrAG.com	1972-02-05
A0003	Gargi	121212	Gargi@CrAG.com	1996-03-22
A0004	Mustafa	33333333	Mf@CrAg.com	2000-01-01

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

• DOC is Date of Creation of an Article.

As an employee of CAG, you are required to write the SQL queries for the following :

(i) To display all the records from the **Articles** table in descending order of price.

(ii) To display the details of Articles which were created in the year 2020.

(iii) To display the structure of **Artists** table.

(iv) (a) To display the name of all artists whose Article is **Painting** through Equi Join.

OR

(b) To display the name of all Artists whose Article is '**Painting**' through Natural Join.

35. A table, named **THEATRE**, in **CINEMA** database, has the following structure : 4

Field	Type
Th_ID	char(5)
Name	varchar(15)
City	varchar(15)
Location	varchar(15)
Seats	int

Write a function **Delete_Theatre()**, to input the value of **Th_ID** from the user and permanently delete the corresponding record from the table.

Assume the following for Python-Database connectivity :

Host : **localhost**, User : **root**, Password : **Ex2025**

SECTION – E (2 × 5 = 10)

36. A file, **PASSENGERS.DAT**, stores the records of passengers using the following structure : 5

[PNR, PName, BRDSTN, DESTN, FARE]

where :

PNR – **Passenger Number (string type)**

PName – **Passenger Name (string type)**

BRDSTN – **Boarding Station Name (string type)**

DESTN – **Destination Station Name (string type)**

FARE – **Fare amount for the journey (float type)**

Write user defined functions in Python for the following tasks :

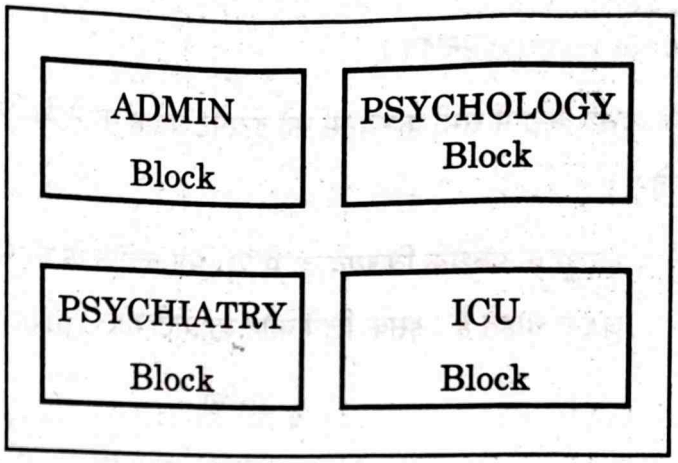
(i) **Create()** – to input data for passengers and write it in the binary file **PASSENGERS.DAT**.

(ii) **SearchDestn(D)** – to read contents from the file **PASSENGERS.DAT** and display the details of those Passengers whose **DESTN** matches with the value of **D**.

(iii) **UpdateFare()** – to increase the fare of all passengers by 5% and rewrite the updated records into the file **PASSENGERS.DAT**.

37. 'Swabhaav' is a big NGO working in the field of Psychological Treatment and Counselling, having its Head Office in Nagpur. It is planning to set up a center in Vijayawada. The Vijayawada Center will have four blocks – ADMIN, PSYCHIATRY, PSYCHOLOGY, and ICU. You, as a Network Expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in questions (i) to (v), keeping the following parameters in mind : **5 × 1 = 5**

Vijayawada Center ⟶



Block to Block distances (in metres) :

From	To	Distance
ADMIN	PSYCHIATRY	65 m
ADMIN	PSYCHOLOGY	65 m
ADMIN	ICU	65 m
PSYCHIATRY	PSYCHOLOGY	100 m
PSYCHIATRY	ICU	50 m
PSYCHOLOGY	ICU	50 m

Distance of Nagpur Head Office from Vijayawada Center = 700 km

Number of Computers in each block is as follows :

Block	No. of Computers
ADMIN	16
PSYCHIATRY	40
PSYCHOLOGY	19
ICU	20

(i) Suggest the most appropriate location of the server inside the Vijayawada Center. Justify your choice.

(ii) Which hardware device will you suggest to connect all the computers within each block of Vijayawada Center ?

(iii) Draw a cable layout to efficiently connect various blocks within the Vijayawada Center.

(iv) Where should the router be placed to provide internet to all the computers in the Vijayawada Center ?

(v) (a) The Manager at Nagpur wants to remotely access the computer in Admin block in Vijayawada. Which protocol will be used for this ?

OR

(b) Which type of Network (PAN, LAN, MAN or WAN) will be set up among the computers connected with Vijayawada Center ?
