COMMON PRE-BOARD EXAMINATION

COMPUTER SCIENCE - Code No. 083

Class-XII-(2025-26)

SET: 2

Time allowed: 3 Hrs. **Maximum Marks: 70**

General Instructions:

Read the following instructions very carefully and follow them:

1. This question paper contains 37 questions.
2. All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
3. The paper is divided into 5 Sections- A, B, C, D and E.
4. Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
5. Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
6. Section C consists of 3 questions (29 to 31). Each question carries 3 Marks.
7. Section D consists of 4 questions (32 to 35). Each question carries 4 Marks.
8. Section E consists of 2 questions (36 to 37). Each question carries 5 Marks.
9. All programming questions are to be answered using Python Language only.
10. In-case of MCQ, text of the correct answer should also be written.

Q.No.	Questions	Marks

Section-A (21 x 1 = 21 Marks)

1. State if the following statement is True or False: **1**
Using the statistics module in Python, the output of the below statements will be 30:

```
import statistics
print(statistics.median([10, 20, 30, 40, 50]))
```

2. What will be the output of the following Python code? **1**

```
message = "ArtificialIntelligence@2025"
print(message.find("i"))
```

A) True B) 7 C) 3 D) 10

3. Fill in the blank with the Boolean value (True/False) such that the following expression evaluates to True: **1**

(False or _____) or (not True and False)

4. In SQL, which clause is used to sort the result set in ascending or descending order? **1**

5. What will be the output of the following Python code? **1**

```
s = "Machine@Learning@AI"
s = s.split('@')
result = s[1] + "#" + s[0] + "#" + s[2]
print(result)
```

A) Learning#Machine#AI B) Machine#Learning#AI

C) Learning@Machine@AI D) AI#Learning#Machine

6. Write the output of the following Python code: **1**

```
T = (5, 10, [15, 20], 25)
T[2][1] = 200
print(T)
```

7. What will be the output of the following Python statement? **1**

```
print(25 - 3**2**1 + 50/2)
```

8. Consider the given SQL Query: **1**

SELECT course, AVG(fees) AS avg_fees FROM institution ORDER BY avg_fees DESC GROUP BY course;

Ananya is executing the above query, but facing an error. Identify and write the corrected SQL query.

9. What will be the output of the following Python code? **1**

```
def test():
    try:
        y = 20 / 2
        return "Try Block"
    except ZeroDivisionError:
        return "Except Block"
    finally:
        return "Finally Block"
print(test())
```

A) Try Block B) Except Block C) Finally Block D) ZeroDivisionError

10. What will be the output of the following Python code? **1**

```
stock = {"laptop": 150, "mouse": 220}
print(stock.popitem( ), end='  ')
print(stock)
```

A) ('laptop ', 150) {'mouse ': 220} B) ('mouse ', 220) { 'laptop ': 150}

C) {'mouse ': 220} (' laptop ', 150) D) {'mouse ': 220} {'laptop ', 150}

11. What possible output is not expected to be displayed on the screen at the time of execution of the Python program from the following code? **1**

```
import random
num = random.randint(1, 4)
Technologies = ["Java", "Python", "Ruby", "C", "C++"]
for i in range(0, num):
   print(Technologies[i], end='**')
print()
```

A) Java**
B) Java**Python**Ruby**C**C++**
C) Java**Python**Ruby**
D) Java**Python**Ruby**C**

12. What will be the output of the following Python code? **1**

```
a = 7
b = 3
def calculate(x):
   global b
   a = x + 3
   b = b + a
   print(a, b, end='##')
calculate(5)
print(a, b)
```

A) 8 11##7 11 B) 5 8##7 8 C) 8 11##8 11 D) 8 10##7 10

13. Which SQL function is used to return the number of rows in a result set? **1**
A) TOTAL( ) B) SUM( ) C) ADD( ) D) COUNT( )

14. Give the output of the given Python code? **1**

```
note = "MAChInE LeaRNING maKES AI sMARTeR"
print(note.count("MA"))
```

A) 4 B) 3 C) 2 D) 1

15. Consider a table EMPLOYEE with 8 records and 4 attributes, and another table DEPARTMENT with 6 records and 3 attributes. What would be the degree and cardinality of the resultant table after performing a NATURAL JOIN operation, assuming one common attribute with 5 matching records? **1**

16. Which SQL query will display unique department names from the table DOCTOR? **1**
A) SELECT ALL dept FROM DOCTOR;
B) SELECT UNIQUE dept FROM DOCTOR;
C) SELECT DISTINCT dept FROM DOCTOR;
D) SELECT dept FROM DOCTOR WHERE dept IS UNIQUE;

17. Which network topology connects all devices to a central device? **1**
A) Bus B) Ring C) Star D) Mesh

18. The modem at the receiver's computer end acts as a _____. **1**
A) Model B) Modulator C) Demodulator D) Convertor

19. In _____ technique, data is divided into chunks called packets, which may travel through different paths and finally reach the destination. **1**
A) Circuit Switching B) Packet Switching D) Message Switching D) Cell Switching

Q20 and Q21 are Assertion(A) and Reason(R) 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.

20. Assertion (A): Python functions can accept positional, keyword and default parameters. **1**
Reason (R): Default parameters allow function arguments to be assigned a default value if no argument is provided during the function call.

21. Assertion (A): A primary key uniquely identifies each record in a table. **1**
Reason (R): A primary key can contain NULL values.

Section-B (7 x 2=14 Marks)

22. A) Differentiate between Differentiate between syntax error and runtime error with suitable example of each. **2**

OR

B) Explain the difference between mutable and immutable data types in Python with suitable examples.

23. Mohan has written a function to print Fibonacci series for first 10 elements. However, there are syntax and logical errors in the code. Rewrite it after removing all the errors. Also, underline all the corrections made. **2**

```
def fibonacci()
   first=0
   second=1
   print(('first no. is ', first)
   print('secondno. is',second)
   for a in range (1,9):
      third=first-second
      print(third)
      first, second = = second, third
fibonacci()
```

24. A) Consider the following List, Colors = ['Red', 'Blue', 'Green', 'Yellow', 'Orange'] **2**
(Answer using Python built-in methods/functions only):
   I) Write a Python statement to insert the element "Purple" at index 2 in the List 'Colors'.
   II) Write a Python statement to reverse the List 'Colors'.

OR

B) Predict the Output for following Python code:

```
def Process(x, y):
    if x < y:
        print('smaller', end=' ')
        return x, y
    else:
        print('larger', end=' ')
        return y, x
numbers = [5, 15, 8, 25, 12]
for i in range(0, 4, 2):
    print(Process(numbers[i], numbers[i+1]))
```

25. A) Write a function SQUARE_LIST(L), where L is the List of elements passed as argument to the function. The function returns another list named 'SList' that stores the Squares of all Non-Zero Elements of L. **2**

For example:
If L contains [9,4,0,11,0,6,0]
The SList will have [81,16,121,36]

OR

B) Write a function AVERAGE_PRICE() that creates a Dictionary of products and their prices and returns the average price of all the products.

For example:
If Dictionary products contains {"Pen": 10, "Notebook": 50, "Eraser": 5}
Then output is, Average price: 21.67

26. Predict the output of the Python code given below: **2**

```
scores = [("Team A", 85), ("Team B", 92), ("Team A", 78)]
results = {}
for entry in scores:
    if entry[1] >= 80:
        results[entry[0]] = "Pass" + str(entry[1])
    else:
        results[entry[0]] = "Fail" + str(entry[1])
print(results)
```

27. A) Write suitable commands to do the following in MySQL. **2**

I) Display all databases available.

II) Add a new column 'email' of VARCHAR(50) type to a table named CUSTOMERS.

OR

B) Differentiate between DELETE and DROP query in SQL with suitable examples.

28. A) Define the following terms: **2**

I) Bandwidth

II) Firewall

OR

B)

I) Expand the following terms: POP3 and SMTP

II) Bring out the difference between Hyper Text Markup Language and Extensible Markup Language.

Section-C (3 x 3 = 9 Marks)

29. A) Write a Python function COUNT_WORDS() that reads a text file "STORY.TXT" and counts how many words start with a vowel (both uppercase and lowercase). Display the count. **3**

For example:

If the file "STORY.TXT" contains:

Once upon a time, in a land far away, there lived an old man.
Everyone loved him because he was kind and generous.

The output should be:

Words starting with vowels: 10

OR

B) Write a function COPY_LINES() in Python that reads a text file "INPUT.TXT" and copies only those lines that contain the word "Python" (case-insensitive) to another file "OUTPUT.TXT".

For example:

If "INPUT.TXT" contains:

Python is a popular programming language.
Java is also widely used.
Learning Python is fun and easy.
C++ is a powerful language.

Then "OUTPUT.TXT" should contain:

Python is a popular programming language.
Learning Python is fun and easy.

30. A List containing records of Gadgets as: **3**

L = [("SmartWatch", 5000), ("Earbuds", 2500), ("Charger", 800), ("PowerBank", 3500)]

Write the following User-Defined Functions to perform operations on a Stack named Product to:

I) Push_gadget() – To push an item containing gadget name and price of gadgets costing more than 2000 into the Stack.
Output: [('SmartWatch', 5000), ('Earbuds', 2500), ('PowerBank', 3500)]

II) Pop_gadget() – To pop the items from the Stack and display them. Also, display "Stack Empty" when there are no elements in the Stack.
Output:
('PowerBank', 3500)
('Earbuds', 2500)
('SmartWatch', 5000)
Stack Empty

31. A) Predict the output of the following Python code: **3**

```
inventory = {"chair": 12, "table": 8, "desk": 5}
output = []
for item, qty in inventory.items():
    output.append(item.upper() + " -> " + str(qty*2) + " items\n")
result = "*".join(output)
print(result)
```

OR

B) Predict the output of the following Python code:

```
num = 50
def calculate(text, multiplier=3):
    global num
    for char in text:
        if char in 'AEIOUaeiou':
            num //= 2
            print(char.upper(), '@', multiplier*num)
        else:
            num += 10
            print(char.lower(), '#', multiplier+num)
string = 'AI'
calculate(string, 5)
print(num, '$', string)
```

Section-D (4 x 4 = 16 Marks)

32. Consider the table EVENTS as given below: **4**

E_Id	E_name	Manager	Price	Capacity
1001	Birthday	Prateek	3000	30
1002	Anniversary	Manoj	15000	50
1003	Reception	Shivansh	25000	NULL
1004	Birthday	Prem	3500	35

A) Write the following SQL queries:

I) To display the total Price for each event, excluding events with total Price less than 5000.

II) To display the EVENTS table sorted by Capacity in descending order.

III) To display the distinct event names from the EVENTS table.

IV) Display the sum of Price of all the events for which the capacity is not known.

OR

B) Predict the output of the following:

I) SELECT E_name, SUM(Price) FROM EVENTS GROUP BY E_name;

II) SELECT Manager FROM EVENTS WHERE manager LIKE '%a%';

III) SELECT E_Id, Price FROM EVENTS WHERE Price BETWEEN 1500 AND 12000;

IV) SELECT MAX(Price) FROM EVENTS;

33. Mr. Athrav is a sports coordinator for a college who maintains data about athletes in a CSV file named Athletes.csv, which stores details of each athlete. **4**

The columns of the CSV file are: Athlete_ID, Name, Sport and MedalCount

Help him efficiently manage the data by writing User-Defined Functions in Python to:

I) AddAthlete() – to accept athlete details from the user and add them to the file.

II) DisplayTopPerformers() – to display the names and sports of athletes who have won more than 3 medals.

34. Mr. Jace is maintaining a Training Database for a Skill Development Institute. Help him extract the required information by writing the appropriate SQL queries as per the tasks mentioned below: **4**

TRAINER

TID	TNAME	CITY	HIREDATE	SALARY
101	SUNAINA	MUMBAI	1998-10-15	90000
102	ANAMIKA	DELHI	1994-12-24	80000
103	DEEPTI	CHANDIGARG	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

COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	AGDCA	12000	2018-07-02	101
C202	ADCA	15000	2018-07-15	103
C203	DCA	10000	2018-10-01	102
C204	DDTP	9000	2018-09-15	104
C205	DHN	20000	2018-08-01	101
C206	O LEVEL	18000	2018-07-25	105

I) Display all the details of Trainers who are living in city CHENNAI.

II) Count and display the number of Trainers in each city.

III) Display the Course details which have Fees more than 12000 and name ends with 'I'.

IV) A) Display the Trainer Name & Course Name from both tables where Course Fees is less than 10000.

OR

B) Display the Cartesian Product of above two tables.

35. Ms. Sneha has created a table named HOTELS in MySQL. **4**
The fields of the table are:

Hotel_id – ID of the Hotel (String)
Name – Name of the hotel (String)
Location – Location of hotel (String)
Rating – Rating of hotel (Float)

Consider the following details to establish Python-MySQL connectivity:

UserName – root

Password – india123

Host – localhost

The table HOTELS exists in a MySQL database named TOURISM.

Sneha wants to display all records of HOTELS relation where Location is 'Mumbai' and Rating is greater than 4.0. Help Sneha to write the program in Python.

Section-E (2 X 5 = 10 Marks)

36. Ms. Pooja is working as an Inventory Manager at a Sports Equipment Store. She needs to manage the records of various sports items at the shop. For this, she wants the following information of each sports item to be stored: **2+3**

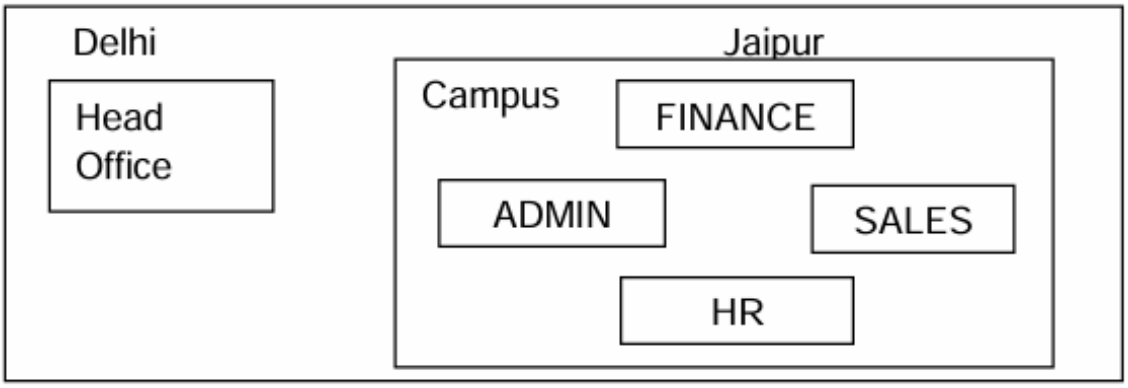
- Item_ID – Integer
- Sport_Type – String (e.g., 'Cricket', 'Football', 'Tennis', 'Badminton')
- Item_Cost – Float
- Quantity – Integer

You, as a programmer of the shop, have been assigned to do this job for Pooja on a Binary file named SPORTS.DAT

I) Write a function DISP_ITEMS() to read the data from the Binary file and display the Item IDs of all 'Cricket' and 'Football' type sports items.

II) Write a function UPDATE_QUANTITY() to update the quantity by adding 10 units to all items whose current quantity is less than 5 in the Binary file.

37. Uzooh Infotech is planning to set up it India campus in Jaipur with its head office in Delhi. The Jaipur campus will have four blocks/buildings – ADMIN, FINANCE, SALES and HR. You, as a network expert, need to suggest the best network-related solutions for them to resolve the issues/problems mention in points (I) to (V), keeping in mind the distances between various block/buildings and other given parameters. **5**



Block to Block distances (in meters):

From	To	Distance
ADMIN	FINANCE	35 m
ADMIN	SALES	110 m
ADMIN	HR	50 m
FINANCE	SALES	65 m
FINANCE	HR	85 m
SALES	HR	70 m
Delhi Head Office	Jaipur Campus	310 Km

Number of Computers in each Block:

Block	Number of Computers
ADMIN	120
FINANCE	10
SALES	50
HR	30

I) Draw the cable layout to efficiently connect various blocks of buildings within the Jaipur campus.

II) Suggest the most appropriate location of the server inside the Jaipur campus. Justify your choice.

III) Suggest the placement of following devices: A) Switch/Hub B) Repeater

IV) Which cost efficient wired medium should be used to connect the computers in Jaipur campus?

V) A) Which type of network is formed by connecting Delhi Head Office with Jaipur Campus?

OR

B) What would be your recommendation for enabling live visual communication between the Admin Office at the Jaipur Campus and Delhi Head Office from the following options:
(i) Video Conferencing (ii) Email (iii) Telephony (iv) Instant Messaging