NOTE: -

- **Please check that this question paper contains 8 printed pages.**
- **Please check that this question paper contains 37 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 the question paper. The students will read the question paper only and will not write any answer on the answer-book during this period.**

Computer Science (083)

Time allowed: 3 hours   **Maximum Marks: 70**

दिशा निर्देश / General Instructions:

- Please check this question paper contains 37 questions.
- All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions
- The paper is divided into 5 Sections- A, B, C, D and E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
- Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
- Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.
- Section D consists of 2 case study type questions (33 to 34). Each question carries 4 Marks.
- Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.
- All programming questions are to be answered using Python Language only.
- In case of MCQ, text of the correct answer should also be written.

Q No.	Section-A (21 x 1 = 21 Marks)	Marks
1	State if the following statement is True or False: The `randrange(1,5)` gives values 1 to 4 only while `randint(1,5)` gives 1 to 5.	1

2	What will be the output of the following code?
	`L = ["Data Analytics", "Science Vision", "Artificial Intelligence"]`
	`print(L[1][2] + L[2][11:-7])`
	a) a b) asion c) iIntel d) VisionIntell
		1

3	Consider the given expression: `False or False and not True or True` Which of the following will be the correct output of the given expression? a) True b) False c) None d) No output	1
4	In SQL, which operator is used to check if a value is within a range of values (inclusive)? a) In b) Between c) Range d) Like	1

5	What will be the output of the following Python code?
	`str = "Data Science"`
	`print(str[-2::-3])`
	a) eiS b) ci a c) ecS d) eai
		1

6	Write the output of the following Python code :
	`for k in range(2,1, -1):`
	`    print(k*'INDIA' + '', sep="@",end="$")`
		1

7	What will be the output of the following Python statement: `print(1*2**3**2/2)`	1
8	Consider the given SQL Query: SELECT class, count(studentname) FROM student where AVG(age) > 10 GROUP BY class; Hemant is executing the query but not getting the correct output. Write the correction.	1

9	What will be the output of the following Python statement?
	<pre>try:
	    value = input("Enter a number") + 100
	except ValueError:
	    print("Value Error occurred!")
	except ZeroDivisionError:
	    print("Division by zero error!")
	except Exception:
	    print("Some other error!")
	finally:
	    print("Program completed!")</pre>a) Value Error occurred! b) Some other error!
	c) Value Error occurred! d) Some other error!
	   Program completed! Program completed!
		1

10	What will be the output of the following Python code?
	<pre>data = {"x": 5, "y": 10, "x": 15}
	print(len(data))
	print(data["x"])</pre>a) 3 and 5 b) 3 and 15 c) 2 and 5 d) 2 and 15
		1

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?
	<pre>import random
	nums = [10, 20, 30, 40, 50]
	low = random.randint(0, 1)
	high = random.randint(1, 2)
	for i in range(low, high + 1):
	    print(nums[i], end="#")</pre>a) 10#20# b) 20#30# c) 10# d) 20#
		1

12	What will be the output of the following Python code?
	<pre>x = 10
	print(x, end='&&')
	def change():
	    global x
	    x = x * 2
	    print(x, end='@@')
	change()
	print(x)</pre>a) 10&&20@@10 b) 10&&10@@20 c) 10&&20@@20 d) 20&&20@@10
		1

13	Which SQL command DOES NOT affect the Cardinality of an existing relation? a) Insert b) Delete c) Update d) Drop	1

14	What is the output of the given Python code?
	<pre>text = "one-two-three-two-one"
	result = text.partition("two")
	print(result)</pre>a) ('one-', '-three-', '-one') b) ('one-', 'two', '-three-two-one')
	c) (' one-two-three-two-one ') d) Error
		1

15	Two relations A and B are joined using a NATURAL JOIN operation.
	    • Relation A has attributes *(RollNo, Name, Class)*
	    • Relation B has attributes *(RollNo, Marks, Grade)*
	What will be the degree of the resulting relation?
		1

	a) 3 b) 4 c) 5 d) 6	
16	In SQL, which of the following commands will delete a table permanently: a) remove b) del c) drop d) delete	1
17	_____ is a protocol used for communication between a web browser and a web server to access web pages on the Internet. a) HTML b) HTTP c) FTP d) PPP	1

18	Which of the following statements is correct about using a Gateway and a Router in a computer network? a) A router connects multiple networks using similar protocols, while a gateway connects networks using different protocols. b) A gateway and a router perform exactly the same function in a network. c) A router is used only for wireless communication, while a gateway is used for wired communication. d) Both gateway and router are used only within a single local network.	1
19	Fill in the blank: A _____ is a networking device that connects multiple computers within a local area network and forwards data only to the device for which it is intended. a) Router b) Hub c) Switch d) Gateway	1
	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): Modifying one list after assigning it to another using = will also modify the second list. Reason (R): In Python, using = to copy a list creates a reference to the same memory location, not a new independent copy.	1
21	Assertion (A): A table can have multiple candidate keys, but only one primary key. Reason (R): All candidate keys that are not chosen as the primary key are called alternate keys.	1
Q No.	**Section-B (7 x 2=14 Marks)**	Marks
22	A. Differentiate between local variables and global variables in Python with the help of a suitable example. **OR** B. Explain the difference between = and == in Python with a suitable example.	2

23	In Following code , there are syntax and logical errors. Rewrite the code after correcting and underlining each correction:
	num1 =int(input("Enter first number: "))
	
	num2 = int(input("Enter second number: ")
	
	if num1 = num2:
	
	print("Both numbers are equal")
	
	else
	
	print("Numbers are not equal"
		2

24	I. Write a statement to find the index of the first occurrence of the 10 in a list named mylist which is [1,10,20,50,10,1]. II. Write a statement to print the elements of list L1 in descending order without making any change to the list L1. **OR** Write Output: words = ['Python', 'is', 'fun', 'to', 'learn'] sentence = '-'.join(words) print(sentence) print(len(sentence))	2

25	A. Write a function double_element() in Python that accepts a list L and a number n. If the number n exists in the list, it should be updated to its double value. If it does not exist, print a message saying "Element not found". **OR** B. Write a Python function add_emplyoee() that accepts a dictionary company_emplyoee, an employee number, a name and department. The function should add the employee number as key and name, department as value to the dictionary. If the employee number already exists, print "Employee already exists" instead of updating it.	2

26	Predict the output of the Python code given below :
	`employees = {"Arun": [55000, 5000], "Reema":`
	`[72000, 8000], "Vijay": [48000, 4000], "Tina":`
	`[65000, 10000]}`
	`high_earners = [ ]`
	`for name in employees:`
	`    pay = employees[name]`
	`    total = pay[0] + pay[1]`
	`    if total > 70000:`
	`        high_earners.append(name)`
	`print(high_earners)`
		2

27	A. Write suitable commands to do the following in MySQL.
	   I. Create a database named CBSE
	   II. Show schema of table KVS
	OR
	B. Differentiate between unique and distinct in SQL with a suitable example.
		2

28	A. Define the following terms with respect to computer networks (i) BANDWIDTH (ii) MODEM **OR** B. (i) Expand the following terms: POP3 , PPP (ii) Differentiate between XML and HTML.	2

Q No.	Section-C (3 x 3 = 9 Marks)	Marks
29	A. Write a Python function that displays the number of lines which contains the word "Python" in a text file named "ProgLang.txt". Also, give total count of such lines. OR B. Write a Python function that displays the number of times the full stop (.), question mark(?) or exclamation mark (!) appears in a text file named "story.txt".	3

| 30 | 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 x 1 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. | 3 |

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

```
s1 = "CSX-12"
s2 = ""
i = 0
while i < len(s1):
    if s1[i] >= '0' and s1[i] <= '9':
        Num = int(s1[i])
        Num += 2
        s2 = s2 + str(Num)
    elif s1[i] >= 'A' and s1[i] <= 'Z':
        s2 = s2 + s1[i].lower()
    else:
        s2 = s2 + '#'
    i += 1
print(s2)
```

OR

B. Predict the output of the following Python code:

```
rivers = ["Ganga", "Yamuna", "Narmada",
"Godavari", "Brahmaputra", "Kaveri"]
result = []
for river in rivers:
    if river[0] in 'GK':
        result.append(river[-2:].upper())
print(result)
```

| Q No. | Section-D (4 x 4 = 16 Marks) | Marks |

| 32 | Consider the table Doctor as given below: | 4 |

DOCTOR

CODE	NAME	DEPT	GENDER	EXPERIENCE
101	SAHIL	ENT	M	10
104	LOKESH	CARDIOLOGY	M	15
103	SNEHA	MEDICINE	F	12
102	MUKESH	ORTHOPADIC	M	11
108	PRATAP	ENT	M	5
107	ARPITA	MEDICINE	F	4
110	RAHUL	SKIN	M	9
115	VIDYA	CARDIOLOGY	F	10
106	KAVYANSH	MEDICINE	M	18

A. Write the following queries:

(i) Display NAME of all doctors whose name contains 'A' and have more than 10 years of experience.

(ii) Display the No. of Doctors in each department.

(iii) Display the name of doctors in ascending order.

(iv) Display all information of female doctors having experience less than 5 years.

OR

B. Predict the output of the following:

    I.   SELECT * FROM Doctor where code> 105 ;

    II.   SELECT Name, Code FROM Doctor WHERE dept in ('ent','caridology','skin','medicine');

    III.   SELECT COUNT(*) FROM DOCTOR WHERE GENDER ='F';

    IV.   SELECT AVG(Experience) FROM DOCTOR group by dept;

| 33 | Write a program in Python that defines and calls the following user defined functions: | |

Add_book( ) : It accepts the values from the user and inserts record of a book to a csv file 'books.csv'. Each record consists of a list with field elements as B_id,B_name and B_price to store Book ID, Book name and price respectively.

Search_Book( ) : To display the records of all the book having price more than 1000.

| 34 | Consider the tables HOTELS and BOOKINGS given below: | |

Table: Hotels

H_ID	Hotel_Name	City	Star_Rating
1	Hotel1	Delhi	5
2	Hotel2	Mumbai	5
3	Hotel3	Hyderabad	4
4	Hotel4	Bengaluru	5
5	Hotel5	Chennai	4
6	Hotel6	Kolkata	4

Table: Bookings

```
+------+------+---------------+------------+------------+
| B_ID | H_ID | Customer_Name | Check_In   | Check_Out  |
+------+------+---------------+------------+------------+
|    1 |    1 | Jiya          | 2024-12-01 | 2024-12-05 |
|    2 |    2 | Priya         | 2024-12-03 | 2024-12-07 |
|    3 |    3 | Alicia        | 2024-12-01 | 2024-12-06 |
|    4 |    4 | Bhavik        | 2024-12-02 | 2024-12-03 |
|    5 |    5 | Charu         | 2024-12-01 | 2024-12-02 |
|    6 |    6 | Esha          | 2024-12-04 | 2024-12-08 |
|    7 |    6 | Dia           | 2024-12-02 | 2024-12-06 |
|    8 |    4 | Sonia         | 2024-12-04 | 2024-12-08 |
+------+------+---------------+------------+------------+
```

Write SQL queries for the following:

(i) Display customer names with the hotel names in which they stayed from tables HOTELS and BOOKINGS

(ii) Display the name of customers who availed hotel facility during the year 2023

(iii) Display the average rating of hotels

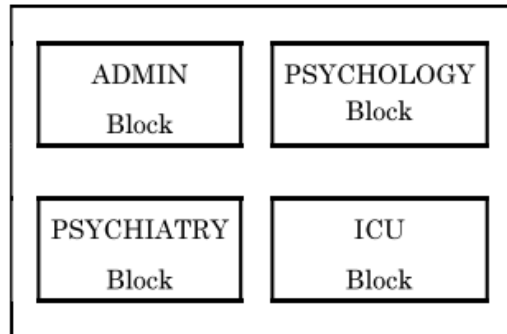(iv) Display the hotel name, city, and rating in descending order of rating.

OR

Display the hotel names of Delhi, Mumbai or Kolkata.

Q No.		Marks
35	MySQL database named WarehouseDB has a product_inventory table in MySQL which contains the following attributes: • Item_code: Item code (Integer) • Product_name: Name of product (String) • Quantity: Quantity of product (Integer) • Cost: Cost of product (Integer) Consider the following details to establish Python-MySQL connectivity: • Username: admin_user • Password: warehouse2024 • Host: localhost Write a Python program to change the Quantity of the product to 91 whose Item_code is 208 in the product_inventory table.	4
Q No.	**Section-E (2 X 5 = 10 Marks)**	**Marks**
36	Ms. Kavita, the librarian of a college, needs to maintain records of books in the library. Each record should include: Book_ID, Book_Title, Author_Name, and Price. Write the Python functions to: I. Input book data and append it to a binary file. II. Update the price of all books written by "R.K. Narayan" to 500.	2+3

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

Vijayawada Center →

ADMIN Block	PSYCHOLOGY Block
PSYCHIATRY Block	ICU Block

Block to Block Distance:

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 Centre = 700 Kms

Number of Computers in each block:

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 ?