SAMPLE QUESTION PAPER (THEORY)
CLASS: XII SESSION: 2024-25
COMPUTER SCIENCE (083)

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

General Instructions:

- 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 3 questions (29 to 31). Each question carries 3 Marks.
- Section D consists of 4 questions (32 to 35). Each question carries 4 Marks.
- Section E consists of 2 questions (36 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 True or False: The Python interpreter handles logical errors during code execution.	(1)
2.	Identify the output of the following code snippet: text = "PYTHONPROGRAM" text=text.replace('PY','#') print(text) (A) #THONPROGRAM (B) ##THON#ROGRAM (C) #THON#ROGRAM (D) #YTHON#ROGRAM	(1)
3.	Which of the following expressions evaluates to False? (A) not(True) and False (B) True or False (C) not(False and True) (D) True and not(False)	(1)
4.	What is the output of the expression? str='International'	(1)

	print(str.split("n")) (A) ('I', 'ter', 'atio', 'al') (B) ['I', 'ter', 'atio', 'al'] (C) ['I', 'n', 'ter', 'n', 'atio', 'n', 'al'] (D) Error	
5.	What will be the output of the following code snippet? str= "World Peace" print(str[-2::-2])	(1)
6.	What will be the output of the following code? tuple1 = (1, 2, 3) tuple2 = tuple1 tuple1 += (4,) print(tuple1 == tuple2) (A) True (B) False (C) tuple1 (D) Error	(1)
7.	If my_dict is a dictionary as defined below, then which of the following statements will raise an exception? my_dict = {'apple': 10, 'banana': 20, 'orange': 30} (A) my_dict.get('orange') (B) print(my_dict['apple', 'banana']) (C) my_dict['apple']=20 (D) print(str(my_dict))	(1)
8.	What does the list.remove(x) method do in Python? (A) Removes the element at index x from the list (B) Removes the first occurrence of value x from the list (C) Removes all occurrences of value x from the list (D) Removes the last occurrence of value x from the list	(1)
9.	Which of the following statements will cause an error? (A) t=1, (B) t=(1,) (C) t=(1) (D) t=tuple(1)	(1)

10.	Write the missing statement to complete the following code:
	file = open("example.txt", "r")
	data = file.read(100)
	_____ #Move the file pointer to the beginning of the file
	next_data = file.read(50)
	file.close()
		(1)

11.	State whether the following statement is True or False: The finally block in Python is executed only if no exception occurs in the try block.	(1)
12.	What will be the output of the following code? c = 10 def add(): global c c = c + 2 print(c,end='#') add() c=15 print(c,end='%') (A) 12%15# (B) 15#12% (C) 12#15% (D) 12%15#	(1)
13.	Which SQL command can change the degree of an existing relation?	(1)
14.	What will be the output of the query? SELECT * FROM products WHERE product_name LIKE 'App%'; (A) Details of all products whose names start with 'App' (B) Details of all products whose names end with 'App' (C) Names of all products whose names start with 'App' (D) Names of all products whose names end with 'App'	(1)
15.	In which datatype the value stored is padded with spaces to fit the specified length. (A) DATE (B) VARCHAR (C) FLOAT (D) CHAR	(1)
16.	Which aggregate function can be used to find the cardinality of a table? (A) sum() (B) count() (C) avg() (D) max()	(1)
17.	Which protocol is used to transfer files over the Internet? (A) HTTP (B) FTP (C) PPP (D) HTTPS	(1)

18.	Which network device is used to connect two networks that use different protocols? (A) Modem (B) Gateway (C) Switch (D) Repeater	(1)
19.	Which switching technique breaks data into smaller packets for transmission, allowing multiple packets to share the same network resources.	(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): In the case of positional arguments, the function call and function definition statements match in terms of the number and order of arguments. Reasoning (R): During a function call, positional arguments should precede keyword arguments in the argument list.	(1)
21.	Assertion (A): A SELECT command in SQL can have both WHERE and HAVING clauses. Reasoning (R): WHERE and HAVING clauses are used to check conditions, therefore, these can be used interchangeably.	(1)

Q No	Section-B (7 x 2=14 Marks)	Marks
22.	How is a mutable object different from an immutable object in Python? Identify one mutable object and one immutable object from the following: (1,2), [1,2], {1:1,2:2}, '123'	(2)
23.	Give two examples of each of the following: (I) Arithmetic operators (II) Relational operators	(2)
24.	If L1=[1,2,3,2,1,2,4,2, . . .], and L2=[10,20,30, . . .], then (I) A) Write a statement to count the occurrences of 4 in L1. OR	(2)

<table>
<tr><td></td><td>B) Write a statement to sort the elements of list L1 in ascending order.

(II)
A) Write a statement to insert all the elements of L2 at the end of L1.
OR
B) Write a statement to reverse the elements of list L2.</td><td></td></tr>
<tr><td>25.</td><td>Identify the correct output(s) of the following code. Also write the minimum and the maximum possible values of the variable b.
import random
a="Wisdom"
b=random.randint(1,6)
for i in range(0,b,2):
print(a[i],end='#')
<table><tr><td>(A) W#</td><td>(B) W#i#</td></tr><tr><td>(C) W#s#</td><td>(D) W#i#s#</td></tr></table></td><td>(2)</td></tr>
<tr><td>26.</td><td>Give an example of a table which has one Primary key and two alternate keys. How many Candidate keys will this table have?</td><td>(2)</td></tr>
<tr><td>27.</td><td>(I)
A) What constraint should be applied on a table column so that duplicate values are not allowed in that column, but NULL is allowed.
OR
B) What constraint should be applied on a table column so that NULL is not allowed in that column, but duplicate values are allowed.
(II)
A) Write an SQL command to remove the Primary Key constraint from a table, named MOBILE. M_ID is the primary key of the table.
OR
B) Write an SQL command to make the column M_ID the Primary Key of an already existing table, named MOBILE.</td><td>(2)</td></tr>
<tr><td>28.</td><td>A) List one advantage and one disadvantage of star topology.
OR
B) Expand the term SMTP. What is the use of SMTP?</td><td>(2)</td></tr>
</table>

Section-C (3 x 3 = 9 Marks)		
29.	A) Write a Python function that displays all the words containing **@cmail** from a text file "Emails.txt". **OR** B) Write a Python function that finds and displays all the words longer than 5 characters from a text file "Words.txt".	(3)
30.	A) You have a stack named **BooksStack** that contains records of books. Each book record is represented as a list containing **book_title**, **author_name**, and **publication_year**. Write the following user-defined functions in Python to perform the specified operations on the stack **BooksStack**: (I) push_book(BooksStack, new_book): This function takes the stack BooksStack and a new book record new_book as arguments and pushes the new book record onto the stack. (II) pop_book(BooksStack): This function pops the topmost book record from the stack and returns it. If the stack is already empty, the function should display "Underflow". (III) peep(BookStack): This function displays the topmost element of the stack without deleting it. If the stack is empty, the function should display 'None'. **OR** B) Write a Python program to input an integer and display all its prime factors in descending order, using a stack. For example, if the input number is 2100, the output should be: 7 5 5 3 2 2 (because prime factorization of 2100 is 7x5x5x3x2x2) **Hint:** *Smallest factor, other than 1, of any integer is guaranteed to be prime.*	(3)
31.	Consider the table ORDERS as given below, and write the following queries: +------+----------+------------+----------+-------+ | O_Id | C_Name | Product | Quantity | Price | +------+----------+------------+----------+-------+ | 1001 | Jitendra | Laptop | 1 | 12000 | | 1002 | Mustafa | Smartphone | 2 | 10000 | | 1003 | Dhwani | Headphone | 1 | 1500 | | . | . | . | . | . | | . | . | . | . | . | | . | . | . | . | . | +------+----------+------------+----------+-------+ **Note**: *The table contains many more records than shown here.* A) (I) To display the total Quantity for each Product, excluding Products with total Quantity less than 5. (II) To display the orders table sorted by total price in descending order. (III) To display the distinct customer names from the Orders table. OR	(3)

	B) (I) To display the total number of orders quantity-wise. (II) To delete all the orders where the Product is Laptop. (III) Display the sum of Price of all the orders for which the quantity is null.	

Q. No.	SECTION D (4 X 4 = 16 Marks)	Marks
32.	A) I. When is ZeroDivisionError exception raised in Python? II. Give an example code to handle ZeroDivisionError? The code should display the message "Division by Zero is not allowed" in case of ZeroDivisionError exception, and the message "Some error occurred" in case of any other exception. **OR** B) I. When is NameError exception raised in Python? II. Give an example code to handle NameError? The code should display the message "Some name is not defined" in case of NameError exception, and the message "Some error occurred" in case of any other exception.	(4)
33.	A csv file "Happiness.csv" contains the data of a survey. Each record of the file contains the following data: ● Name of a country ● Population of the country ● Sample Size (*Number of persons who participated in the survey in that country*) ● Happy (*Number of persons who accepted that they were Happy*) For example, a sample record of the file may be: Signiland, 5673000, 5000, 3426 Write the following Python functions to perform the specified operations on this file: (I) Read all the data from the file and display all those records for which the population is more than 5000000. (II) Count the number of records in the file.	(4)
34.	Saman has been entrusted with the management of Law University Database. He needs to access some information from FACULTY and COURSES tables for a survey analysis. Help him extract the following information by writing the desired SQL queries as mentioned below. Table: **FACULTY** **F_ID** | **FName** | **LName** | **Hire_Date** | **Salary**	(4)

102	Amit	Mishra	12-10-1998	12000
103	Nitin	Vyas	24-12-1994	8000
104	Rakshit	Soni	18-5-2001	14000
105	Rashmi	Malhotra	11-9-2004	11000
106	Sulekha	Srivastava	5-6-2006	10000

Table: **COURSES**

C_ID	F_ID	CName	Fees
C21	102	Grid Computing	40000
C22	106	System Design	16000
C23	104	Computer Security	8000
C24	106	Human Biology	15000
C25	102	Computer Network	20000
C26	105	Visual Basic	6000

(I) To display complete details (from both the tables) of those Faculties whose salary is less than 12000.

(II) To display the details of courses whose fees is in the range of 20000 to 50000 (both values included).

(III) To increase the fees of all courses by 500 which have "Computer" in their Course names.

(IV) (A) To display names (FName and LName) of faculty taking System Design.

OR

(B) To display the Cartesian Product of these two tables.

35. A table, named STATIONERY, in ITEMDB database, has the following structure:

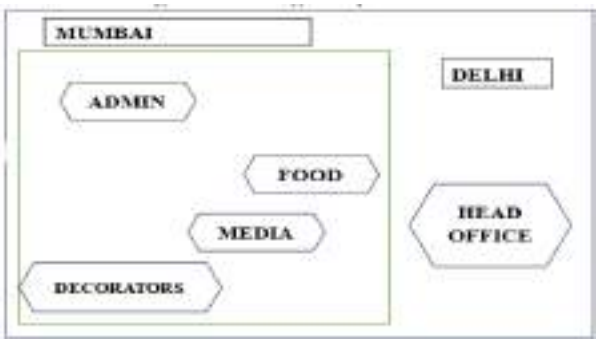
```
+----------+-------------+
| Field    | Type        |
+----------+-------------+
| itemNo   | int(11)     |
| itemName | varchar(15) |
| price    | float       |
| qty      | int(11)     |
+----------+-------------+
```

Write the following Python function to perform the specified operation: (4)

AddAndDisplay(): To input details of an item and store it in the table STATIONERY. The function should then retrieve and display all records from the STATIONERY table where the Price is greater than 120.

Assume the following for Python-Database connectivity:

Host: localhost, User: root, Password: Pencil

Q.No.	SECTION E (2 X 5 = 10 Marks)	Marks
36.	Surya is a manager working in a recruitment agency. He needs to manage the records of various candidates. For this he wants the following information of each candidate to be stored: Candidate_ID – integer Candidate_Name – string Designation – string Experience – float You, as a programmer of the company, have been assigned to do this job for Surya. Suggest: (I) What type of file (text file, csv file, or binary file) will you use to store this data? Give one valid reason to support your answer. (II) Write a function to input the data of a candidate and append it in the file that you suggested in part (I) of this question. (III) Write a function to read the data from the file that you suggested in part (I) of this question and display the data of all those candidates whose experience is more than 10.	(5)
37.	Event Horizon Enterprises is an event planning organization. It is planning to set up its India campus in Mumbai with its head office in Delhi. The Mumbai campus will have four blocks/buildings - ADMIN, FOOD, MEDIA, DECORATORS. 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 in mind the distances between various blocks/buildings and other given parameters.  Block to Block distances (in Mtrs.) From / To / Distance ADMIN / FOOD / 42 m ADMIN / MEDIA / 96 m	(5)

ADMIN	DECORATORS	48 m
FOOD	MEDIA	58 m
FOOD	DECORATORS	46 m
MEDIA	DECORATORS	42 m

Distance of Delhi Head Office from Mumbai Campus = 1500 km

Number of computers in each of the blocks/Center is as follows:

ADMIN	25
FOOD	18
MEDIA	30
DECORATORS	20
DELHI HEAD OFFICE	18

(I) Suggest the most appropriate location of the server inside the MUMBAI campus. Justify your choice.

(II) Which hardware device will you suggest to connect all the computers within each building?

(III) Draw the cable layout to efficiently connect various buildings within the MUMBAI campus. Which cable would you suggest for the most efficient data transfer over the network?

(IV) Is there a requirement of a repeater in the given cable layout? Why/ Why not?

(V) A) What would be your recommendation for enabling live visual communication between the Admin Office at the Mumbai campus and the DELHI Head Office from the following options:

a) Video Conferencing
b) Email
c) Telephony
d) Instant Messaging

OR

B) What type of network (PAN, LAN, MAN, or WAN) will be set up among the computers connected in the MUMBAI campus?