SAMPLE QUESTION PAPER
Class XII Session 2026-27
COMPUTER SCIENCE (Code 083)

TIME: 3 hours **MAX. 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	Write the output on execution of the following Python code: L1=[10,20,25,30] L1.insert(1,15) print(L1)	1
2	What will be the output of the following expression? Msg = "programming is amazing" print(Msg.split("m")) a) ['progra', '', 'ing is a', 'azing'] b) ['progra', 'ming is a', 'azing'] c) ('progra', '', 'ing is amazing') d) ['program', 'ing is a', 'zing']	1
3	Which of the following data types in Python is mutable? a) Tuple b) String c) Integer d) List	1
4	A column in one table matching a primary key of another table is called a: a) Composite key b) Candidate key c) Foreign key d) Super key	1
5	Consider the following Python code: t = (1, 2, 3) l = [4, 5] print(t + l) What will happen when this code is executed? a) [1, 2, 3, 4, 5] b) (1, 2, 3, 4, 5) c) Error, because a tuple cannot be concatenated with a list	1

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	d) ((1, 2, 3), [4, 5])	

6	What possible output is expected to be displayed on the screen at the time of execution of the Python program from the following code?
	import random
	games = {0: "Chess",1: "Scrabble",2: "Sudoku",3: "Tic-Tac-Toe",4: "Puzzle"
	}
	start_key = random.randint(1, 2)
	end_key = random.randrange(3, 4)
	for k in range(start_key, end_key + 1):
	print(games[k], end="@@")
	a) Sudoku@@Tic-Tac-Toe@@Puzzle@@
	b) Scrabble@@Sudoku@@Tic-Tac-Toe@@
	c) Chess@@Scrabble@@Tic-Tac-Toe@@
	d) Scrabble@@Tic-Tac-Toe@@
		1

7	Predict the output for the following: Dl={"Pen":12, "Pencil":6, "Scale":5, "InkPen":20} print(12 in Dl) a) False b) Error c) None d) True	1
8	Long-distance communication without line-of-sight is mainly achieved using: a) Microwaves b) Ultraviolet c) Radio waves d) X-rays	1
9	Which MySQL query will display all employees whose salaries are between 90,000 and 100,000 (including limits)? a) SELECT * FROM Employees WHERE salary > 90000 AND salary < 100000; b) SELECT * FROM Employees WHERE salary IN (90000, 100000); c) SELECT * FROM Employees WHERE salary BETWEEN 90000 AND 100000; d) SELECT * FROM Employees WHERE salary = 90000 OR salary = 100000;	1
10	What will be the output of the following Python statement: print(25+100**1**3/5)	1
11	What is the data type of the result when the expression 5 // 2 is evaluated in Python? a) float b) int c) string d) None	1
12	Every network interface card (NIC) comes with its own _____ address. a) Internet Protocol (IP) b) Open Systems Interconnection (OSI) c) Physical (MAC) d) Dynamic Host Configuration Protocol (DHCP)	1
13	In a student table, “Class” can only take values from {IX, X, XI, XII}. This set is called the _____. a) Domain b) Tuple	1

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	c) Attribute d) Key	

14	What would be written in the file errorlog.txt after the following code is run?
	def data(num):
	try:
	return 190/(29-num)
	except ZeroDivisionError:
	logfile = open ("errorlog.txt", "w")
	logfile.write ("Num was 29")
	logfile.close()
	data(29)
		1

15	Which of the following will NOT change if you insert a new record into a table? a) Cardinality b) Degree c) Number of tuples d) Total rows	1
16	What will be the output of the following Python code? y = 8 def update(): y = y + 2 print(y) update() a) 10 b) 8 c) Error d) None	1
17	In _____ switching, before a communication starts, a dedicated path is identified between the sender and the receiver. a) Graph b) Plot c) Circuit d) Packet	1
18	What will be the output of the following Python code? text = "Drone Expo" print(text[-2: :-4])	1
19	Which MySQL command correctly removes an attribute Age from table Student? a) ALTER TABLE Student DROP COLUMN Age; b) ALTER TABLE Student REMOVE Age; c) DROP COLUMN Age FROM Student; d) DELETE COLUMN Age FROM Student;	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): Opening a file in mode rb allows you to read a binary file without modifying it. Reason (R): In rb mode, if the file does not exist, Python creates a new empty file.	1

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21	Assertion (A): The MySQL query SELECT Student_Name FROM Student WHERE Guardian_Phone IS NULL; displays the names of students whose guardian phone number is not recorded. Reason (R): In MySQL, you can also use = to check for NULL values; it is equivalent to IS NULL to identify columns with no value.	1
	Section-B (7 x 2=14 Marks)	
22	A. Define global variable and local variable with a suitable example. OR B. Write the difference between the seek() and tell() methods in Python text file handling with a suitable example.	2
23	The Python program below tries to print the list in reverse. However, there are syntax and logical errors in the code. Rewrite it after removing all the errors. Also, underline all the corrections made words=["Class Test","Term Exams","Pre-board Exam","Board Exam'] L=len(words) for i in range(L, -1, -1) Print (words[i] , end = " ")	2
24	A. Write a Python function capitalize_words(words) that takes a list of strings words and returns a new list with each word capitalize. Example: If the input is ["python", "computer", "science"] The output should be ["Python", "Computer", "Science"]. OR B. Write a Python function sum_positive(list1) that takes a list of numbers and prints the sum of all positive numbers in the list. Example: If the input is [10, -5, 20, -3, 7] The output should be 37.	2
25	A. (Answer using Python built-in methods/functions only): I. Write a statement to check whether the string username starts with "admin". II. Given data = [2, 7, 9, 9, 2], write a statement to count how many times the largest element occurs. OR B. Predict the output of the following Python code: text = "Python Programming" print(text.replace("o", "0")) print(text.find("z"))	2

26	Predict the output of the following Python code:
	code = "gLaD5"
	result = []
	i = 0
	while i < len(code):
	if code[i].isupper():
	result.append(code[i].lower())
		2

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	elif code[i].isdigit():
	result.append(int(code[i]) * 2)
	else:
	result.append("#")
	i += 1
	print(result)	

27	A. Write suitable commands to do the following in MySQL. I. Display a list of all the relations stored in a database. II. Delete a database named CS_SP. OR B. Differentiate between alter and update command in MySQL with a suitable example.	2
28	A. Which protocol helps us to browse through web pages using internet browsers? Name any one internet browser. OR B. Define tree topology. Also, write down any one limitation of tree topology.	2
	Section-C (3 x 3 = 9 Marks)	
29	A. Write and call a Python function to read "History.txt" and display all lines that contain a four-digit year (e.g., 1999, 2024 etc.) OR B. Write a Python function that displays the number of times the word "Python" appears in a text file named "Prog.txt".	3
30	A list containing records of books is given as: B = [("Machine Learning Basics", 550), ("World Geography", 450), ("Wonder World", 140), ("AI Revolution", 750)] Write the following user-defined functions to perform operations on a stack named Books: I. Push_element()**:** Push only those books whose price is more than 250 into the stack. II. Pop_element(): Pop the items from the stack and display them. After all items are popped, display "Stack Empty". Expected Output: ('AI Revolution', 750) ('World Geography', 450) ('Machine Learning Basics', 550) Stack Empty	3
31	A. Write a Python function avg_len( ) segment that adds up the lengths of all the words in a list and then prints the average (mean) length. OR B. Consider the tuple pairs = ((2,5),(4,2),(9,8),(12,10)). Write a Python function cnt_even( ) to count the number of pairs (a, b) where both a and b are even.	3
	Section-D (4 x 4 = 16 Marks)	

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32	Consider the table TECH_EVENT_REG as given below: +--------+------------------+------------------+-------+---------+ | reg_id | participant_name | event_name | grade | reg_fee | +--------+------------------+------------------+-------+---------+ | 501 | Aarav | Hackathon | 11 | 200 | | 502 | Riya | RoboRace | 10 | 150 | | 503 | Krish | WebDev Challenge | 12 | 250 | | 504 | Navya | Hackathon | 11 | 200 | | 505 | Samaira | CodeSprint | 9 | 100 | | 506 | Rohan | RoboRace | 10 | 150 | +--------+------------------+------------------+-------+---------+ A. Write the following queries: I. To display the number of participants in each event where the number of participants is greater than 1. II. To display the distinct event names available in the Tech Event. III. To display details of participants whose names contain the letters 'an'. IV. To display all records of TECH_EVENT_REG sorted by participant_name in descending order. **OR** B. Predict the output of the following: I. Select participant_name, event_name from tech_event_reg where grade = 11; II. Select event_name, count(*) from tech_event_reg group by event_name; III. Select participant_name from tech_event_reg where event_name like '%challenge'; IV. Select max(reg_fee) from tech_event_reg where grade in (9, 10);	4
33	Kabir runs a vehicle rental agency and maintains a CSV file named Rentals.csv. The file stores daily rental details with columns: Vehicle_ID, Vehicle_Type, Hours_Rented, Rate_Per_Hour Create the following user-defined functions: I. AddRental() – to accept rental details from the user and append them to Rentals.csv. II. CalculateTotalRent() – to calculate and return the total rent earned (Hours_Rented × Rate_Per_Hour).	4
34	Aditi is managing an events database and needs to access certain information from the chess_event and registrations tables for an upcoming survey. Help her extract the required information by writing the appropriate MySQL queries as per the tasks mentioned below: Table: Chess_Event +----------+-----------------------------+------------+----------------------+-----------------+ | Event_ID | Event_Name | Event_Date | Venue | Max_Participants | +----------+-----------------------------+------------+----------------------+-----------------+ | 101 | Inter-School Chess Championship | 2025-01-15 | Auditorium Hall | 60 | | 102 | Rapid Chess Tournament | 2025-02-10 | Activity Room 3 | 40 | | 103 | Under-16 Chess Cup | 2025-03-05 | Sports Complex Room 2 | 50 | | 104 | Teachers vs Students Chess Meet | 2025-04-12 | Library Conference Area | 30 | | 105 | Open Blitz Chess Challenge | 2025-05-20 | IT Lab 1 | 80 | +----------+-----------------------------+------------+----------------------+-----------------+ Table: Registrations	4

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	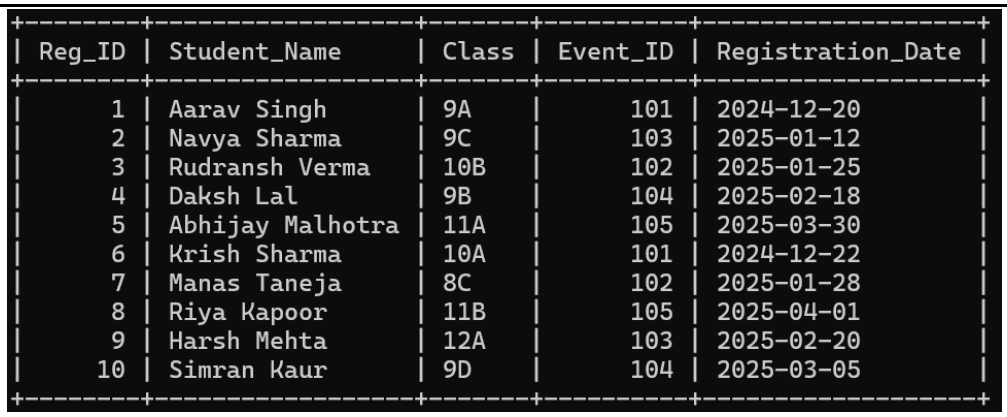 I. Write a MySQL query to update the venue of the event "Inter-School Chess Championship" to "Multi-Purpose Hall". II. Display the details of all chess events scheduled after 2025-01-01. III. Write a MySQL query to display the registration details of students who have registered for events scheduled in 'Auditorium Hall', 'Activity Room 3', or 'Library Conference Area'. IV. a. Display the student_name along with the event_name for all registrations or b. Write a MySQL query to display the cartesian product of Chess_Event and Registrations tables.	
35	MySQL database named LibraryDB has a table book_records which contains the following attributes: • Book_ID**:** ID of the book (Integer) • Book_Title: Title of the book (String) • Author: Author of the book (String) • Copies: Number of copies available (Integer) Consider the following details to establish Python-MySQL connectivity: • Username: librarian • Password**:** lib@2025 • Host: localhost Write a Python-MySQL program to change the Book_Title to 'Data Structures in Python' for the record whose Book_ID is 109 in the book_records table.	4
	Section-E (2 X 5 = 10 Marks)	
36	A college administrator, Atul, maintains student course enrollment records. Each record includes Roll_No, Student_Name, Course, Fees. Write Python functions to: I. Input enrollment details and append them to a binary file. II. Update the Fees of all students enrolled in the "Data Science" course to 75000.	2+3
37	AKA University is setting up its Academic blocks at Raipur and planning to set up a network. The university has 3 academic blocks and one Human Resource Center as shown in the diagram below:	5

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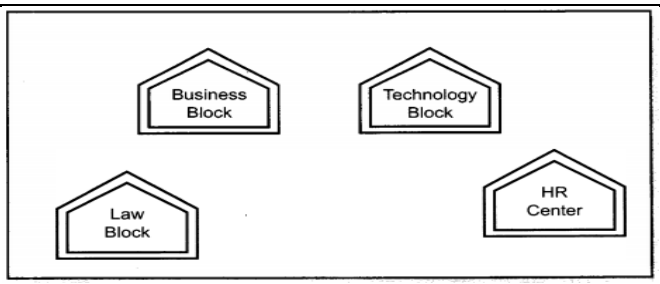

Center to center distances between various blocks is as follows:

Law Block to Business Block	90 m
Law Block to Technology Block	55 m
Law Block to HR Center	120 m
Business Block to Technology Block	70 m
Business Block to HR Center	105 m
Technology Block to HR Center	45 m

Number of Computers in each of the Blocks/Center is as follows:

Law Block	30
Technology Block	55
HR Center	120
Business Block	45

I. Suggest the most suitable place (i.e. Block/Center) to install the server of this university with a suitable reason.

II. Identify and draw the most suitable topology for connecting all the blocks if the university wants a centralized network management system.

III. Suggest and placement of the following devices with reasons.
   a. Repeater
   b. Switch

IV. The Institute is planning to link its study center situated in Delhi. Suggest a way to connect it with reasonably high speed guided medium.

V. A. The Vice-Chancellor wants to hold a face-to-face digital meeting with the Heads of Departments in all blocks simultaneously. Which Protocol will be used?

OR

B. What is the use of VoIP?

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MARKING SCHEME: SAMPLE QUESTION PAPER
Class XII Session 2026-27
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TIME: 3 hours **MAX. 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.

Q No.	Section-A (21 x 1 = 21 Marks)	Marks
1	**Answer:** [10, 15, 20, 25, 30] **(1 mark for correct answer)**	1
2	**Answer:** a) ['progra', '', 'ing is a', 'azing'] **(1 mark for correct answer)**	1
3	**Answer:** d) List **(1 mark for correct answer)**	1
4	**Answer:** c) Foreign key **(1 mark for correct answer)**	1
5	**Answer:** c) Error, because a tuple cannot be concatenated with a list **(1 mark for correct answer)**	1
6	**Answer:** b) Scrabble@@Sudoku@@Tic-Tac-Toe@@ **(1 mark for correct answer)**	1
7	**Answer:** a) False **(1 mark for correct answer)**	1

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8	**Answer:** c) Radio waves **(1 mark for correct answer)**	1
9	**Answer:** c) SELECT * FROM Employees WHERE salary BETWEEN 90000 AND 100000; **(1 mark for correct answer)**	1
10	**Answer:** 45.0 **(1 mark for correct answer)**	1
11	**Answer:** b) int **(1 mark for correct answer)**	1
12	**Answer:** c) Physical (MAC) address **(1 mark for correct answer)**	1
13	**Answer:** a) Domain **(1 mark for correct answer)**	1
14	**Answer:** Num was 29 **(1 mark for correct answer)**	1
15	**Answer:** b) Degree **(1 mark for correct answer)**	1
16	**Answer:** c) Error **(1 mark for correct answer)**	1
17	**Answer:** c) Circuit **(1 mark for correct answer)**	1
18	**Answer:** peD **(1 mark for correct answer)**	1
19	**Answer:** a) ALTER TABLE Student DROP COLUMN Age; **(1 mark for correct answer)**	1

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20	**Answer:** c) A is true, but R is false **(1 mark for correct answer)**	1
21	**Answer:** c) A is true, but R is false **(1 mark for correct answer)**	1
	Section-B (7 x 2=14 Marks)	

22	**Answer:**
	A. Global variable: Defined outside a function; accessible anywhere in the program.
	x = 10 # global
	print(x)
	
	Local variable: Defined inside a function; accessible only inside that function.
	def demo():
	y = 5 # local
	print(y)
	OR
	B. tell(): Returns the current position of the file pointer in the file.
	
	f = open("file.txt", "r")
	print(f.tell()) # e.g.,0
	
	seek(offset): Moves the file pointer to a specified position in the file.
	f.seek(5) # moves pointer to 5th byte
	(1 mark for correct difference)
	(1/2 mark for each correct example)
		2

23	**Answer:** words=["Class Test","Term Exams","Pre-board Exam","Board Exam**"**] L=len(words) for i in range(**L-1**, -1, -1)**:** **print** (words[i] , end = " ") **(1/2 mark each for correcting 4 mistakes)**	2

24	**Answer:**
	A.
	def capitalize_words(words): #words is a list of strings
	result = [ ]
	for w in words:
	result.append(w.capitalize())
	print(result)
	OR
	B.
	def sum_positive(list1): #list1 is a list of numbers
	total = 0
	for num in list1:
	if num > 0:
		2

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<table>
<tr><td></td><td>total += num
print(total)
(1/2 mark for function definition)
(1 mark for the correct/similar logic)
(1/2 mark for correct print statement)</td><td></td></tr>
<tr><td>25</td><td>Answer:
A.
I. username.startswith("admin") (1 mark for correct answer)
II. data.count(max(data)) (1 mark for correct answer)
OR
B.
Pyth0n Pr0gramming (1 mark for correct answer)
-1 (1 mark for correct answer)</td><td>2</td></tr>
<tr><td>26</td><td>Answer:
['#', 'l', '#', 'd', 10]
(2 marks for the correct output)</td><td>2</td></tr>
<tr><td>27</td><td>Answer:
A. I. Show tables; (1 mark for correct answer)
II. Drop database CS_SP; (1 mark for correct answer)
OR
B.<table><tr><td>ALTER</td><td>UPDATE</td></tr><tr><td>Used to change the structure of a table. It adds, deletes or modifies columns or constraints.</td><td>Used to modify the data stored in the table. It changes the values in rows.</td></tr><tr><td>Ex: ALTER TABLE Employee ADD age INT;</td><td>Ex: UPDATE Employee SET salary = 50000 WHERE emp_id = 10;</td></tr></table>(1 mark for correct answer)
(1/2 mark for each correct example)
C.</td><td>2</td></tr>
<tr><td>28</td><td>Answer:
A. HTTP (Hyper Text Transfer Protocol) helps us browse web pages using internet browsers.
Name of any one internet browser can be Chrome / Firefox / Edge / Safari / Opera.
(1 mark for correct definition)
(1 mark for any one browser name)
OR
B. Tree topology is a network topology that combines characteristics of bus and star topologies, where groups of star-configured computers are connected to a central bus backbone.
Limitations: Failure of the main backbone cable can bring down the entire network. It is expensive because it requires a lot of cable and network devices.
(1 mark for correct definition)
(1 mark for any one limitation)</td><td>2</td></tr>
</table>

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	Section-C (3 x 3 = 9 Marks)	

29	**Answer:**
	A. def DisplayYearLines( ):
	f = open("History.txt", "r")
	for line in f:
	words = line.split()
	for w in words:
	if w.isdigit() and len(w) == 4:
	print(line)
	break
	f.close()
	DisplayYearLines( )
	(1/2 mark for correct function header)
	(1/2 mark for correctly opening the file)
	(1 1/2 mark for correct/similar logic for displaying the desired lines)
	(1/2 mark for correctly calling the function)
	OR
	
	B. def count_python():
	count = 0
	with open("Prog.txt", 'r') as file:
	text = file.read()
	words = text.split()
	for word in words:
	if word.lower() == "python":
	count += 1
	print("The word Python appears", count, "times.")
	(1/2 mark for correct function header)
	(1/2 mark for correctly opening the file)
	(1/2 mark for correctly reading from the file)
	(1/2 mark for splitting the text into words)
	(1/2 mark for correct use of counter variable)
	(1/2 mark for displaying the result)
		3

30	**Answer:**
	I.
	B = [("Machine Learning Basics", 550),("World Geography", 450),("Wonder World", 140),("AI Revolution", 750)]
	Books = [ ]
	def Push_element():
	for item in B:
	if item[1] > 250:
	Books.append(item)
	II.
	def Pop_element():
	while Books:
	print(Books.pop())
	print("Stack Empty")
	(1½ marks for each correct part)
		3

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31	**Answer:**
	A.
	def avg_len(words):
	  total = 0
	  count = 0
	  for w in words:
	  total += len(w)
	  count += 1
	  return total / count
	my_words = ["computer", "science", "python", "data"]
	print("Average word length:", avg_len(my_words))
	OR
	B.
	pairs = ((2,5), (4,2), (9,8), (12,10))
	def cnt_even(t):
	  c = 0
	  for a, b in t:
	  if a % 2 == 0 and b % 2 == 0:
	  c += 1
	  return c
	print("Number of even-even pairs:", cnt_even(pairs))
	(1/2 mark for function definition)
	(2 marks for the correct/similar logic)
	(1/2 mark to print/return statement)
		3

	Section-D (4 x 4 = 16 Marks)	
32	**Answer:** A. I. select event_name, count(*) as total_participants from tech_event_reg group by event_name having count(*) > 1; II. select distinct event_name from tech_event_reg; III. select * from tech_event_reg where participant_name like '%an%'; IV. select * from tech_event_reg order by participant_name desc; **(4 x 1 mark for each correct query)** **OR** B. I.	4

```
+------------------+------------+
| participant_name | event_name |
+------------------+------------+
| Aarav            | Hackathon  |
| Navya            | Hackathon  |
+------------------+------------+
```

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II.

event_name	COUNT(*)
Hackathon	2
RoboRace	2
WebDev Challenge	1
CodeSprint	1

III.

participant_name
Krish

IV.

MAX(reg_fee)
150

(4 x 1 mark for each correct query output)

33 **Answer:** 4

```
import csv
def AddRental():
    Vehicle_ID = input("Enter Vehicle ID: ")
    Vehicle_Type = input("Enter Vehicle Type: ")
    Hours_Rented = input("Enter Hours Rented: ")
    Rate_Per_Hour = input("Enter Rate Per Hour: ")
    with open("Rentals.csv", "a") as f:
        w = csv.writer(f)
        w.writerow([Vehicle_ID, Vehicle_Type, Hours_Rented, Rate_Per_Hour])
    print("Rental record added successfully.")
```

(½ mark for correctly taking user input)
(½ mark for opening the file in append mode)
(½ mark for correctly creating the writer object)
(½ mark for correctly using writerow() of writer object)

```
def CalculateTotalRent():
```

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	total = 0 f = open("Rentals.csv", "r") r = csv.reader(f) for row in r: hours = int(row[2]) rate = int(row[3]) total += hours * rate print("Total Rent Earned:", total) f.close() **(1⁄2 mark for opening in the file in right mode)** **(1⁄2 mark for correctly creating the reader object)** **(1⁄2 mark for correc calculation by converting it into integers)** **(1⁄2 mark for correctly displaying the total rent earned)** **Note (for both parts (I) and (II)):** **Ignore import csv as it may be considered the part of the complete program.**	
34	**Answer:** I. UPDATE CHESS_EVENTS SET Venue = **'**Multi-Purpose Hall**'** WHERE Event_Name = 'Inter-School Chess Championship'; II. SELECT * FROM CHESS_EVENTS WHERE Event_Date > '2025-01-01'; III. SELECT * FROM REGISTRATIONS R JOIN CHESS_EVENTS C ON R.Event_ID = C.Event_ID WHERE C.Venue IN ('Auditorium Hall', 'Activity Room 3', 'Library Conference Area'); IV. A. SELECT R.Student_Name, C.Event_Name FROM REGISTRATIONS R JOIN CHESS_EVENTS C ON R.Event_ID = C.Event_ID; OR B. SELECT * FROM CHESS_EVENTS, REGISTRATIONS; **(4 x 1 mark for each correct query)**	4
35	**Answer:** import mysql.connector con=mysql.connector.connect(host="localhost",user="librarian",password="lib@2025", database="LibraryDB") cur = con.cursor() q = "UPDATE book_records SET Book_Title='Data Structures in Python' WHERE Book_ID=109" cur.execute(q) con.commit() print("Book title updated successfully.") cur.close() con.close() **(1⁄2 mark for correctly importing the connector object)** **(1⁄2 mark for correctly creating the connection object)** **(1⁄2 mark for correctly creating the cursor object)** **(1 mark for correct creation of update query)** **(1 mark for correctly executing the query with commit)** **(1⁄2 mark for correctly closing the connection)**	4

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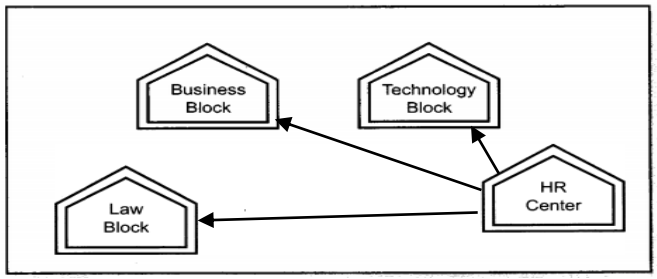
	Section-E (2 X 5 = 10 Marks)	

36	**Answer:**
	I.
	def AddEnrollment():
	Roll = int(input("Enter Roll No: "))
	Name = input("Enter Student Name: ")
	Course = input("Enter Course: ")
	Fees = int(input("Enter Fees: "))
	rec = [Roll, Name, Course, Fees] # LIST record
	with open("Enrollments.dat", "ab") as f:
	pickle.dump(rec, f)
	print("Record added successfully.")
	(1/2 mark for correctly defining the function header)
	(1/2 mark for correctly opening the file in append mode)
	(1/2 mark for correctly taking user input)
	(1/2 mark for using dump() method of the pickle module)
	
	II.
	import pickle
	def UpdateFees():
	updated = False
	records = []
	with open("Enrollments.dat", "rb") as file:
	try:
	while True:
	rec = pickle.load(file)
	if rec[2] == "Data Science": # Course at index 2
	rec[3] = 75000 # Fees at index 3
	updated = True
	records.append(rec)
	except EOFError:
	pass
	with open("Enrollments.dat", "wb") as file:
	for rec in records:
	pickle.dump(rec, file)
	if updated:
	print("Fees updated for Data Science students.")
	else:
	print("No student enrolled in Data Science found.")
	(1/2 mark for correctly defining the function header)
	(1/2 mark for correctly opening the file)
	(1 mark for using load() with while loop and try-except block)
	(1 mark for checking the condition and updating the value)
	
	Note (for both parts (I) and (II)):
	Ignore import pickle as it may be considered the part of the complete program.
		2+3

37	**Answer:** I. HR Centre as it has maximum number of computers.	5

*There is no change in the Question Paper Design and Assessment Pattern for Academic Session 2026-27.

II. Star Topology



III. a. Repeater is to be placed between HR Center to Law Block and from HR Center to Business Block as distance between them is more than 100 meters.
b. Switch is to be placed in all the block as network is to be formed in each and every block.

IV. Optical Fibre

V. A. VOIP (Voice Over Internet Protocol)

OR

B. Voice over Internet Protocol (VoIP) is a technology that allows users to make phone calls and other communications over the Internet instead of a traditional phone line.

(5 x 1 mark for each correct part)

*There is no change in the Question Paper Design and Assessment Pattern for Academic Session 2026-27.

COMPUTER SCIENCE – Code No. 083
SAMPLE QUESTION PAPER*
Class - XII - (2025-26)

Time Allowed: 3 Hrs. **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 if the following statement is True or False: Using the statistics module, the output of the below statements will be 20: import statistics statistics.median([10, 20, 10, 30, 10, 20, 30])	1
2	What will be the output of the following code? L = ["India", "Incredible", "Bharat"] print(L[1][0] + L[2][-1]) a) IT b) it c) It d) iT	1
3	Consider the given expression: print(19<11 and 29>19 or not 75>30) Which of the following will be the correct output of the given expression? a) True b) False c) Null d) No output	1
4	In SQL, which type of Join(s) may contain duplicate column(s)?	1
5	What will be the output of the following Python code? str= "Soft Skills" print(str[-3::-3]) a) lSf b) Stkl c) StKi d) l	1
6	Write the output of the following Python code : for k in range(7,40,6): print (k + '-')	1
7	What will be the output of the following Python statement: print(10-3**2**2+144/12)	1
8	Consider the given SQL Query: SELECT department, COUNT(*) FROM employees HAVING COUNT(*) > 5 GROUP BY department;	1

*Please note that the assessment scheme of the Academic Session 2024-25 will continue in the current session i.e. 2025-26.

	Saanvi is executing the query but not getting the correct output. Write the correction.	

9	What will be the output of the following Python code?
	try:
	  x = 10 / 0
	except Exception:
	  print("Some other error!")
	except ZeroDivisionError:
	  print("Division by zero error!")
	a) Division by zero error! b) Some other error!
	c) ZeroDivisionError d) Nothing is printed
		1

10	What will be the output of the following Python code? my_dict = {"name": "Alicia", "age": 27, "city": "DELHI"} print(my_dict.get("profession", "Not Specified")) a) Alicia b)DELHI c)None d)Not Specified	1
11	What possible output is expected to be displayed on the screen at the time of execution of the Python program from the following code? import random L=[10,30,50,70] Lower=random.randint(2,2) Upper=random.randint(2,3) for K in range(Lower, Upper+1): print(L[K], end="@") a) 50@70@ b) 90@ c) 10@30@50@ d) 10@30@50@70@	1

12	What will be the output of the following Python code?
	i = 5
	print(i,end='@@')
	def add():
	  global i
	  i = i+7
	  print(i,end='##')
	add()
	print(i)
	a) 5@@12##15 b) 5@@5##12 c) 5@@12##12 d)12@@12##12
		1

13	Which SQL command can change the cardinality of an existing relation? a) Insert b) Delete c) Both a) & b) d) Drop	1
14	What is the output of the given Python code? st='Waterskiing is thrilling!' print(st.split("i")) a) ['Watersk', 'ng ', 's thr', 'll', 'ng!'] b) ['Watersk', '', 'ng ', 's thr', 'll', 'ng!'] c) ['Watersk', 'i', 'ng ', 's thr', 'll', 'ng!'] d) Error	1
15	In SQL, a relation consists of 5 columns and 6 rows. If 2 columns and 3 rows are added to the existing relation, what will be the updated degree of a relation? a) Degree: 7 b) Degree: 8 c) Degree: 9 d) Degree: 6	1
16	Which SQL command is used to remove a column from a table in MySQL? a) UPDATE b) ALTER c) DROP d) DELETE	1

*Please note that the assessment scheme of the Academic Session 2024-25 will continue in the current session i.e. 2025-26.

17	_____ is a protocol used for retrieving emails from a mail server. a) SMTP b) FTP c) POP3 d) PPP	1
18	Which of the following is correct about using a Hub and Switch in a computer network? a) A hub sends data to all devices in a network, while a switch sends data to the specific device. b) A hub sends data only to the devices it is connected to, while a switch sends data to all devices in a network. c) A hub and switch function the same way and can be used interchangeably. d) A hub and switch are both wireless networking devices.	1
19	Which of the following is used to create the structure of a web page? a) CSS b) HTML c) JavaScript d) FTP	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): The expression (1, 2, 3, 4).append(5) in Python will modify the original sequence datatype. Reason (R): The append() method adds an element to the end of a list and modifies the list in place.	1
21	Assertion (A): A primary key must be unique and cannot have NULL values. Reasoning (R): The primary key uniquely identifies each row in the table.	1
Q No.	**Section-B (7 x 2=14 Marks)**	**Marks**
22	A. Explain the difference between explicit and implicit type conversion in Python with a suitable example. **OR** B. Explain the difference between break and continue statements in Python with a suitable example.	2
23	The code provided below is intended to remove the first and last characters of a given string and return the resulting string. However, there are syntax and logical errors in the code. Rewrite it after removing all the errors. Also, underline all the corrections made. define remove_first_last(str): if len(str) < 2: return str new_str = str[1:-2] return new_str result = remove_first_last("Hello") Print("Resulting string: " result)	2
24	A. (Answer using Python built-in methods/functions only): I. Write a statement to find the index of the first occurrence of the substring "good" in a string named review. II. Write a statement to sort the elements of list L1 in descending order.	2

*Please note that the assessment scheme of the Academic Session 2024-25 will continue in the current session i.e. 2025-26.

	OR B. Predict the output of the following Python code: text="Learn Python with fun and practice" print(text.partition("with")) print(text.count("a"))	
25	A. Write a function remove_element() in Python that accepts a list L and a number n. If the number n exists in the list, it should be removed. If it does not exist, print a message saying "Element not found". **OR** B. Write a Python function add_contact() that accepts a dictionary phone_book, a name, and a phone number. The function should add the name and phone number to the dictionary. If the name already exists, print **"Contact already exists"** instead of updating it.	2

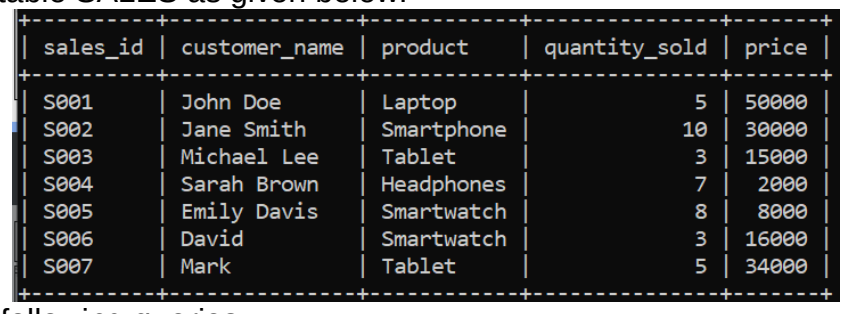
26	Predict the output of the Python code given below :
	emp = {"Arv": (85000,90000),"Ria": (78000,88000),"Jay": (72000,80000),"Tia": (80000,70000)}
	selected = [ ]
	for name in emp:
	salary = emp[name]
	average = (salary[0] + salary[1]) / 2
	if average > 80000:
	selected.append(name)
	print(selected)
		2

27	A. Write suitable commands to do the following in MySQL. I. View the table structure. II. Create a database named SQP **OR** B. Differentiate between drop and delete query in SQL with a suitable example.	2
28	A. Define the following terms: I. Modem II. Gateway **OR** B. I. Expand the following terms: HTTP and FTP II. Differentiate between web server and web browser.	2
Q No.	**Section-C (3 x 3 = 9 Marks)**	**Marks**
29	A. Write a Python function that displays the number of times the word "Python" appears in a text file named "Prog.txt". **OR** B. Write and call a Python function to read lines from a text file STORIES.TXT and display those lines which doesn't start with a vowel (A, E, I, O, U) irrespective of their case.	3
30	A list containing records of products as L = [("Laptop", 90000), ("Mobile", 30000), ("Pen", 50), ("Headphones", 1500)] Write the following user-defined functions to perform operations on a stack named Product to:	3

*Please note that the assessment scheme of the Academic Session 2024-25 will continue in the current session i.e. 2025-26.

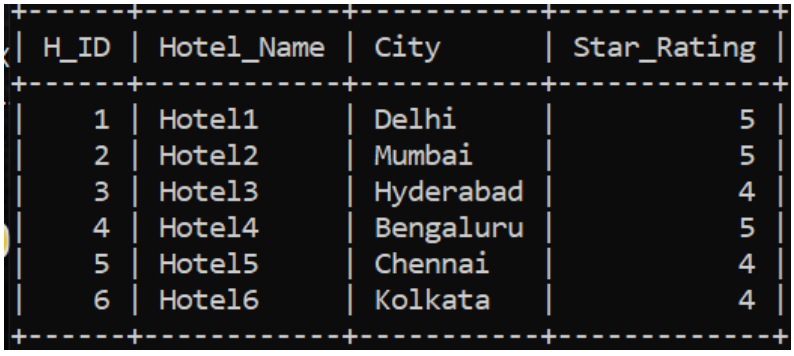
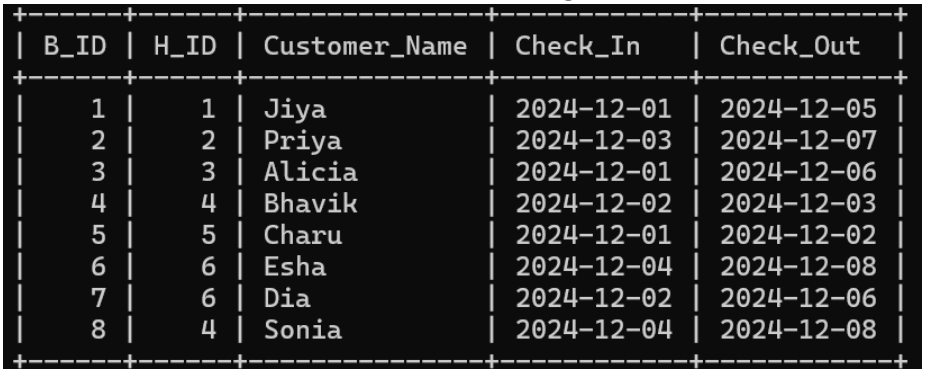
	I. Push_element() – To push an item containing the product name and price of products costing more than 50 into the stack. Output: [('Laptop', 90000), ('Mobile', 30000), ('Headphones', 1500)] II. Pop_element() – To pop the items from the stack and display them. Also, display "Stack Empty" when there are no elements in the stack. Output: ('Headphones', 1500) ('Mobile', 30000) ('Laptop', 90000) Stack Emply	

31	A. Predict the output of the following Python code:
	s1="SQP-25"
	s2=""
	i=0
	while i<len(s1):
	if s1[i]>='0' and s1[i]<='9':
	Num=int(s1[i])
	Num-=1
	s2=s2+str(Num)
	elif s1[i]>='A' and s1[i]<='Z':
	s2=s2+s1[i+1]
	else:
	s2=s2+'^'
	i+=1
	print(s2)
	OR
	B. Predict the output of the following Python code:
	wildlife_sanctuary = ["Kaziranga", "Ranthambhore", "Jim Corbett", "Sundarbans", "Periyar", "Gir", "Bandipur"]
	output = [ ]
	for sanctuary in wildlife_sanctuary:
	if sanctuary[-1] in 'aeiou':
	output.append(sanctuary[0].upper())
	print(output)
		3

Q No.	**Section-D (4 x 4 = 16 Marks)**	**Marks**
32	Consider the table SALES as given below:  A. Write the following queries: I. To display the total quantity sold for each product whose total quantity sold exceeds 12. II. To display the records of SALES table sorted by Product name in descending order.	4

sales_id	customer_name	product	quantity_sold	price
S001	John Doe	Laptop	5	50000
S002	Jane Smith	Smartphone	10	30000
S003	Michael Lee	Tablet	3	15000
S004	Sarah Brown	Headphones	7	2000
S005	Emily Davis	Smartwatch	8	8000
S006	David	Smartwatch	3	16000
S007	Mark	Tablet	5	34000

*Please note that the assessment scheme of the Academic Session 2024-25 will continue in the current session i.e. 2025-26.

	III. To display the distinct Product names from the SALES table. IV. To display the records of customers whose names end with the letter 'e'. **OR** B. Predict the output of the following: I. SELECT * FROM Sales where product='Tablet'; II. SELECT sales_id, customer_name FROM Sales WHERE product LIKE 'S%'; III. SELECT COUNT(*) FROM Sales WHERE product in ('Laptop', 'Tablet'); IV. SELECT AVG(price) FROM Sales where product='Tablet';	
33	Raj is the manager of a medical store. To keep track of sales records, he has created a CSV file named Sales.csv, which stores the details of each sale. The columns of the CSV file are: Product_ID, Product_Name, Quantity_Sold and Price_Per_Unit. Help him to efficiently maintain the data by creating the following user-defined functions: I. Accept() – to accept a sales record from the user and add it to the file Sales.csv. II. CalculateTotalSales() – to calculate and return the total sales based on the Quantity_Sold and Price_Per_Unit.	4
34	Pranav is managing a Travel Database and needs to access certain information from the Hotels and Bookings tables for an upcoming tourism survey. Help him extract the required information by writing the appropriate SQL queries as per the tasks mentioned below: **Table: Hotels**  **Table: Bookings** 	4

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

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

*Please note that the assessment scheme of the Academic Session 2024-25 will continue in the current session i.e. 2025-26.

<table>
<tr><td></td><td>I. To display a list of customer names who have bookings in any hotel of 'Delhi' city.
II. To display the booking details for customers who have booked hotels in 'Mumbai', 'Chennai', or 'Kolkata'.
III. To delete all bookings where the check-in date is before 2024-12-03.
IV. A. To display the Cartesian Product of the two tables.
OR
B. To display the customer’s name along with their booked hotel’s name.</td><td></td></tr>
<tr><td>35</td><td>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.</td><td>4</td></tr>
<tr><td>Q No.</td><td>Section-E (2 X 5 = 10 Marks)</td><td>Marks</td></tr>
<tr><td>36</td><td>Mr. Ravi, a manager at a tech company, needs to maintain records of employees. Each record should include: Employee_ID, Employee_Name, Department and Salary.
Write the Python functions to:
I. Input employee data and append it to a binary file.
II. Update the salary of employees in the "IT" department to 200000.</td><td>2+3</td></tr>
<tr><td>37</td><td>XYZNova Inc. is planning a new campus in Hyderabad while maintaining its headquarters in Bengaluru. The campus will have four buildings: HR, Finance, IT, and Logistics. As a network expert, you are tasked with proposing the best network solutions for their needs based on the following:
<table>
<tr><th>From</th><th>To</th><th>Distance (in meters)</th></tr>
<tr><td>HR</td><td>Finance</td><td>50</td></tr>
<tr><td>HR</td><td>IT</td><td>175</td></tr>
<tr><td>HR</td><td>Logistics</td><td>90</td></tr>
<tr><td>Finance</td><td>IT</td><td>60</td></tr>
<tr><td>Finance</td><td>Logistics</td><td>70</td></tr>
<tr><td>IT</td><td>Logistics</td><td>60</td></tr>
</table>
Number of Computers in Each Block:
<table>
<tr><th>Block</th><th>Number of Computers</th></tr>
<tr><td>HR</td><td>60</td></tr>
<tr><td>Finance</td><td>40</td></tr>
<tr><td>IT</td><td>90</td></tr>
</table></td><td>5</td></tr>
</table>

*Please note that the assessment scheme of the Academic Session 2024-25 will continue in the current session i.e. 2025-26.

		Logistics | 35	
	I.	Suggest the best location for the server in the Hyderabad campus and explain your reasoning.	
	II.	Suggest the placement of the following devices: a) Repeater b) Switch	
	III.	Suggest and draw a cable layout of connections between the buildings inside the campus.	
	IV.	The organisation plans to provide a high-speed link with its head office using a wired connection. Which of the cables will be most suitable for this job?	
	V.	A. What is the use of VoIP? **OR** B. Which type of network (PAN, LAN, MAN, or WAN) will be formed while connecting the Hyderabad campus to Bengaluru Headquarters?	

*Please note that the assessment scheme of the Academic Session 2024-25 will continue in the current session i.e. 2025-26.

COMPUTER SCIENCE – Code No. 083
MARKING SCHEME
Class - XII - (2025-26)

Time Allowed: 3 Hrs. **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	**Answer:** True **(1 mark for correct answer)**	1
2	**Answer:** c) It **(1 mark for correct answer)**	1
3	**Answer:** b) False **(1 mark for correct answer)**	1
4	**Answer:** Equi-Join or Cartesian Join **(1 mark for correct answer)**	1
5	**Answer:** a) lSf **(1 mark for correct answer)**	1
6	**Answer:** Error as unsupported operand type(s) for +: 'int' and ‘str' **(1 mark for the correct answer)**	1
7	**Answer:** -59.0 **(1 mark for the correct answer)**	1

8	**Answer:** SELECT department, COUNT(*) FROM employees GROUP BY department HAVING COUNT(*) > 5; **(1 mark for correct answer)**	1
9	**Answer:** b) Some other error! **(1 mark for correct answer)**	1
10	**Answer:** d) Not Specified **(1 mark for correct answer)**	1
11	**Answer:** a) 50@70@ **(1 mark for correct answer)**	1
12	**Answer:** c) 5@@12##12 **(1 mark for correct answer)**	1
13	**Answer:** c) Both a) & b) **(1 mark for correct answer)**	1
14	**Answer:** b) ['Watersk', '', 'ng ', 's thr', 'll', 'ng!'] **(1 mark for correct answer)**	1
15	**Answer:** a) Degree: 7 **(1 mark for correct answer)**	1
16	**Answer:** b) ALTER **(1 mark for correct answer)**	1
17	**Answer:** c) POP3 **(1 mark for correct answer)**	1
18	**Answer:** a) A hub sends data to all devices in a network, while a switch sends data to the specific device **(1 mark for correct answer)**	1

19	**Answer:** b) HTML **(1 mark for correct answer)**	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	**Answer:** d) A is False but R is True **(1 mark for correct answer)**	1
21	**Answer:** a) Both A and R are true and R is the correct explanation for A **(1 mark for correct answer)**	1
Q No.	**Section-B (7 x 2=14 Marks)**	**Marks**

22	**Answer:**
	A. Implicit Conversion: Python automatically converts one data type to another.
	
	Example:
	x = 10
	y = 3.5
	result = x + y # x is implicitly converted to float
	Explicit Conversion: The user manually converts one data type to another using functions like int(), float().
	Example:
	x = "10"
	y = int(x) # Explicit conversion from string to integer
	
	(1 mark for correct difference)
	(1/2 mark for each correct example)
	OR
	B. Break exits the loop entirely, while continue skips the current iteration and moves to the next one.
	Example of break:
	for i in range(5):
	  if i == 2:
	  break # Exits the loop
	  print(i)
	Output:
	1
	Example of continue:
	for i in range(5):
	  if i == 2:
		2

	continue # Skips printing 2
	print(i)
	Output:
	1
	3
	4
	5
	(1 mark for correct difference)
	(1/2 mark for each correct example)	

23	**Answer:** **def** remove_first_last(str): if len(str) < 2: return str new_str = str[1:**-1**] return new_str result = remove_first_last("Hello") **print**("Resulting string: "**,** result) **(1⁄2 mark each for correcting 4 mistakes)**	2
24	**Answer:** A. I. index = review.find("good") **(1 mark for correct answer)** II. L1.sort(reverse=True) **(1 mark for correct answer)** **OR** B. ('Learn Python ', 'with', ' fun and practice') **(1 mark for correct answer)** 3 **(1 mark for correct answer)**	2

25	**Answer:**
	A.
	def remove_element(L, n):
	if n in L:
	L.remove(n)
	print(L)
	else:
	print("Element not found")
	OR
	B.
	def add_contact(phone_book, name, number):
	if name in phone_book:
	print("Contact already exists")
	else:
	phone_book[name] = number
	print("Contact added successfully")
	(1/2 mark for function definition)
	(1½ marks for the correct/similar logic)
		2

26	**Answer:** ['Arv', 'Ria'] **(2 marks for the correct output)**	2

27	**Answer:** A. I. Desc table_name; or describe table_name; II. Create database SQP; (1 mark for each correct answer.) **OR** B. The DELETE query removes all the records or specific records from a table, preserving the table structure. Example: DELETE FROM Employees WHERE EmployeeID = 5; The DROP query removes the entire table or database along with its data. Example: DROP TABLE Employees; **(1 mark for correct difference)** **(1/2 mark for each correct example)**	2
28	**Answer:** A. I. A modem is a device that helps connect your computer or other devices to the internet. It converts digital signals from your device into analog signals that can travel through phone lines or other networks, and vice versa. II. A gateway is a device that connects two different networks and helps them communicate with each other. It translates the data between different network types, allowing them to work together. **(1 mark for each correct definition)** **OR** B. I. HTTP: Hypertext Transfer Protocol and FTP: File Transfer Protocol (1/2 mark for each correct expansion.) II. A web server stores and delivers web pages to users over the internet. A web browser requests and displays these web pages on the user's device. **(1 mark for correct point of difference)**	2
Q No.	**Section-C (3 x 3 = 9 Marks)**	**Marks**

29	**Answer:**
	A.
	
	def count_python():
	count = 0
	with open("Prog.txt", 'r') as file:
	text = file.read()
	words = text.split()
	for word in words:
	if word.lower() == "python":
	count += 1
	print("The word Python appears", count, "times.")
	
	(1/2 mark for correct function header)
	(1/2 mark for correctly opening the file)
	(1/2 mark for correctly reading from the file)
	(1/2 mark for splitting the text into words)
	(1/2 mark for correct use of counter variable)
		3

	(1/2 mark for displaying the result)
	OR
	B.
	def display_non_vowel_lines():
	  with open("STORIES.TXT", "r") as file:
	  print("Lines that don't start with a vowel:")
	  lines = file.readlines()
	  for line in lines:
	  if line[0].lower() not in 'aeiou':
	  print(line)
	display_non_vowel_lines()
	(1/2 mark for correct function header)
	(1/2 mark for correctly opening the file)
	(1/2 mark for correctly reading from the file)
	(1 mark for correctly displaying the desired lines)
	(1/2 mark for correctly calling the function)	

30	**Answer:**
	I.
	L = [("Laptop", 90000), ("Mobile", 30000), ("Pen", 50), ("Headphones", 1500)]
	product = []
	def Push_element(L):
	  for i in L:
	  if i[1] > 50:
	  product.append(i)
	  print(product)
	
	II.
	def Pop_element(product):
	  while product:
	  print(product.pop())
	  else:
	  print("Stack Emply")
	
	(1½ marks for each correct part)
		3

31	**Answer:** A. QP-^14 **(3 marks for the correct output)** **OR** B. ['K', 'R'] **(3 marks for the correct output)**	3
Q No.	**Section-D (4 x 4 = 16 Marks)**	**Marks**
32	**Answer:** A. I. SELECT Product, SUM(Quantity_Sold) FROM SALES GROUP BY Product HAVING SUM(Quantity_sold) > 12; II. SELECT * FROM SALES ORDER BY Product DESC; III. SELECT DISTINCT Product FROM SALES; IV. SELECT * from SALES where Customer_Name like "%e";	4

(4 x 1 mark for each correct query)

OR

B.

I.

sales_id	customer_name	product	quantity_sold	price
S003	Michael Lee	Tablet	3	15000
S007	Mark	Tablet	5	34000

II.

sales_id	customer_name
S002	Jane Smith
S005	Emily Davis
S006	David

III.

COUNT(*)
3

IV.

AVG(price)
24500.0000

(4 x 1 mark for each correct query)

33 **Answer:** 4

I.

```
import csv
def Accept():
    product_id = input("Enter Product ID: ")
    product_name = input("Enter Product Name: ")
    quantity_sold = int(input("Enter Quantity Sold: "))
    price_per_unit = float(input("Enter Price Per Unit: "))
    with open('Sales.csv', 'a', newline='') as file:
        writer = csv.writer(file)
        writer.writerow([product_id, product_name, quantity_sold, price_per_unit])
    print("Sales record added successfully.")
```

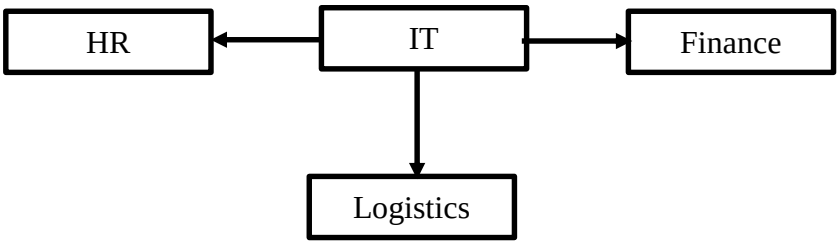
(1/2 mark for correctly taking user input)
(1/2 mark for opening the file in append mode)
(1/2 mark for correctly creating the writer object)

	(1/2 mark for correctly using writerow() of writer object)
	
	II.
	def CalculateTotalSales():
	  total_sales = 0.0
	  with open('Sales.csv', 'r') as file:
	  reader = csv.reader(file)
	  for row in reader:
	  total_sales += int(row[2]) * float(row[3])
	  print("Total Sales is:", total_sales)
	
	(1/2 mark for opening in the file in right mode)
	(1/2 mark for correctly creating the reader object)
	(1/2 mark for correctly checking the condition)
	(1/2 mark for correctly displaying the total sales)
	
	Note (for both parts (I) and (II)):
	Ignore import csv as it may be considered the part of the complete program.	

34	**Answer:** I. SELECT Customer_Name FROM Hotels, Bookings WHERE Hotels.H_ID = Bookings.H_ID AND City = 'Delhi'; II. SELECT Bookings.* FROM Hotels, Bookings WHERE Hotels.H_ID = Bookings.H_ID AND City IN ('Mumbai', 'Chennai', 'Kolkata'); III. DELETE FROM Bookings WHERE Check_In < '2024-12-03'; IV. A. SELECT * FROM Hotels, Bookings; **OR** B. SELECT Customer_Name, Hotel_Name FROM Hotels, Bookings WHERE Hotels.H_ID = Bookings.H_ID; **(4 x 1 mark for each correct query)**	4
35	**Answer:** import mysql.connector connection = mysql.connector.connect(host='localhost',user='admin_user',password='warehouse2024',database='WarehouseDB') cursor = connection.cursor() update_query = "UPDATE product_inventory SET Quantity = 91 WHERE Item_code = 208" cursor.execute(update_query) connection.commit() print("Data updated successfully.") cursor.close() connection.close() **(1/2 mark for correctly importing the connector object)** **(1/2 mark for correctly creating the connection object)** **(1/2 mark for correctly creating the cursor object)**	4

	(1 mark for correct creation of update query) **(1 mark for correctly executing the query with commit)** **(1/2 mark for correctly closing the connection)**	
Q No.	**Section-E (2 X 5 = 10 Marks)**	**Marks**

36	**Answer:**
	I.
	import pickle
	def append_data():
	  with open("emp.dat", 'ab') as file:
	  employee_id = int(input("Enter Employee ID: "))
	  employee_name = input("Enter Employee Name: ")
	  department = input("Enter Department: ")
	  salary = float(input("Enter Salary: "))
	  pickle.dump([employee_id, employee_name, department, salary], file)
	  print("Employee data appended successfully.")
	
	(1/2 mark for correctly defining the function header)
	(1/2 mark for correctly opening the file in append mode)
	(1/2 mark for correctly taking user input)
	(1/2 mark for using dump() method of the pickle module)
	
	II.
	def update_data():
	  updated = False
	  employees = []
	  with open("emp.dat", 'rb') as file:
	  try:
	  while True:
	  employee = pickle.load(file)
	  if employee[2] == "IT":
	  employee[3] = 200000
	  updated = True
	  employees.append(employee)
	  except EOFError:
	  pass
	  with open("emp.dat", 'wb') as file:
	  for employee in employees:
	  pickle.dump(employee, file)
	  if updated:
	  print("Salaries updated for IT department.")
	  else:
	  print("No employee found in the IT department.")
	
	(1/2 mark for correctly defining the function header)
	(1/2 mark for correctly opening the file)
	(1 mark for using load() with while loop and try-except block)
	(1 mark for checking the condition and updating the value)
		2+3

	Note: Note (for both parts (I) and (II)): (i) Ignore import pickle as it may be considered the part of the complete program.	
37	**Answer:** I. Block IT should house the server as it has maximum number of computers. II. a) Repeater is to be placed between Block IT to Block HR as distance between them is more than 100 metres. b) Switch is to be placed in each and every building. III. Draw the star topology cable layout.  IV. Optical Fibre V. A. Voice over Internet Protocol (VoIP) is a technology that allows users to make phone calls and other communications over the Internet instead of a traditional phone line. **OR** B. WAN will be formed. **(5 x 1 mark for each correct part)**	5

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?
	`country='International'`
	`print(country.split("n"))`
	(A) ('I', 'ter', 'atio', 'al')
	(B) ['I', 'ter', 'atio', 'al']
	(C) ['I', 'n', 'ter', 'n', 'atio', 'n', 'al']
	(D) Error
		(1)

5.	What will be the output of the following code snippet?
	`message= "World Peace"`
	`print(message[-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.	If a table which has one Primary key and two alternate keys. How many Candidate keys will this table have? (A) 1 (B) 2 (C) 3 (D) 4	(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): Positional arguments in Python functions must be passed in the exact order in which they are defined in the function signature. Reasoning (R): This is because Python functions automatically assign default values to positional arguments.	(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 *(Answer using builtin functions only)* (I) A) Write a statement to count the occurrences of 4 in L1. OR B) Write a statement to sort the elements of list L1 in ascending order.	(2)

	(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.	

25.	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='#')`
	(A) W# (B) W#i#
	(C) W#s# (D) W#i#s#
		(2)

26.	The code provided below is intended to swap the first and last elements of a given tuple. However, there are syntax and logical errors in the code. Rewrite it after removing all errors. Underline all the corrections made.
	`def swap_first_last(tup)`
	`  if len(tup) < 2:`
	`  return tup`
	`  new_tup = (tup[-1],) + tup[1:-1] + (tup[0])`
	`  return new_tup`
	`result = swap_first_last((1, 2, 3, 4))`
	`print("Swapped tuple: "  result)`
		(2)

27.	(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.	(2)

	(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.	
28.	A) List one advantage and one disadvantage of star topology. **OR** B) Expand the term SMTP. What is the use of SMTP?	(2)

Q No.	Section-C (3 x 3 = 9 Marks)	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 the definition of a user-defined function `push_even(N)` which accepts a list of integers in a parameter `N` and pushes all those integers which are even from the list `N` into a Stack named `EvenNumbers`. Write function pop_even() to pop the topmost number from the stack and returns it. If the stack is already empty, the function should display "Empty". Write function Disp_even() to display all element of the stack without deleting them. If the stack is empty, the function should display 'None'.	(3)

For example:
If the integers input into the list `VALUES` are:
[10, 5, 8, 3, 12]

Then the stack `EvenNumbers` should store:
[10, 8, 12]

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

```
d = {"apple": 15, "banana": 7, "cherry": 9}
str1 = ""
for key in d:
    str1 = str1 + str(d[key]) + "@" + "\n"
str2 = str1[:-1]
print(str2)
```

OR

Predict the output of the following code:

```
line=[4,9,12,6,20]
for I in line:
   for j in range(1,I%5):
       print(j,'#',end="")
   print()
```

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

32. Consider the table ORDERS as given below (4)

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) Write the following queries:

(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.

(IV) Display the sum of Price of all the orders for which the quantity is null.

OR

B) Write the output

```
(I) Select c_name, sum(quantity) as total_quantity
from orders group by c_name;

(II) Select * from orders where product like
'%phone%';

(III) Select o_id, c_name, product, quantity, price
from orders where price between 1500 and 12000;

(IV) Select max(price) from orders;
```

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 in the form of a list 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
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

(4)

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: (4)

Field	Type
itemNo	int(11)
itemName	varchar(15)
price	float
qty	int(11)

Write the following Python function to perform the specified operation:
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

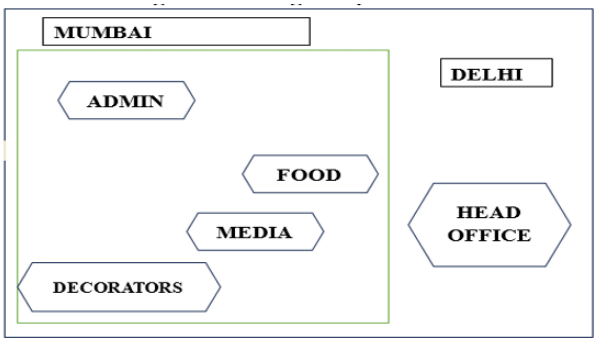
Q.No.	SECTION E (2 X 5 = 10 Marks)	Marks

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: (5)
- 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.

(I) Write a function to input the data of a candidate and append it in a binary file.

	(II) Write a function to update the data of candidates whose experience is more than 10 years and change their designation to "Senior Manager". (III) Write a function to read the data from the binary file and display the data of all those candidates who are not "Senior Manager".	
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.	(5)



Block to Block distances (in Mtrs.)

From	To	Distance
ADMIN	FOOD	42 m
ADMIN	MEDIA	96 m
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	30
FOOD	18
MEDIA	25
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?	

MARKING SCHEME

Class: XII Session: 2024-25

Computer Science (083)

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

Q No.	SECTION A (21X1=21)	Marks
1.	False *(1 mark for correct answer)*	(1)
2.	(A) #THONPROGRAM *(1 mark for correct answer)*	(1)
3.	(A) not (True) and False *(1 mark for correct answer)*	(1)
4.	(B) ['I', 'ter', 'atio', 'al'] *(1 mark for correct answer)*	(1)
5.	ce lo *(1 mark for correct answer)*	(1)
6.	(B) False *(1 mark for correct answer)*	(1)
7.	(B) print(my_dict['apple', 'banana']) *(1 mark for correct answer)*	(1)
8.	(B) Removes the first occurrence of value x from the list *(1 mark for correct answer)*	(1)
9.	(C) 3 *(1 mark for correct answer)*	(1)
10.	file.seek(0) (OR file.seek(0,0)) *(1 mark for correct answer)*	(1)
11.	False *(1 mark for correct answer)*	(1)
12.	(C) 12#15% *(1 mark for correct answer)*	(1)
13.	Alter (or Alter Table) *(1 mark for correct answer)*	(1)

14.	(A) Details of all products whose names start with 'App' *(1 mark for correct answer)*	(1)
15.	(D) CHAR *(1 mark for correct answer)*	(1)
16.	(B) count() *(1 mark for correct answer)*	(1)
17.	(B) FTP *(1 mark for correct answer)*	(1)
18.	(B) Gateway *(1 mark for correct answer)*	(1)
19.	(B) Packet Switching *(1 mark for correct answer)*	(1)
20.	(C) A is True but R is False. *(1 mark for correct answer)*	(1)
21.	(C) A is True but R is False. *(1 mark for correct answer)*	(1)

Q No.	**SECTION B (7 X 2 =14)**	**Marks**
22.	A mutable object can be updated whereas an immutable object cannot be updated. Mutable object: [1,2] or {1:1,2:2} (Any one) Immutable object: (1,2) or '123' (Any one) *(1 mark for correct difference)* *(½ x 2 = 1 Mark for selecting correct objects)*	(2)
23.	(I) Arithmetic operators: +,- (II) Relational operators: >, >= *(½ x 4 = 2 Marks for each correct operator)*	(2)
24.	(I) A) L1.count(4) OR B) L1.sort() *(1 mark for correct answer)*	(2)

	(II) A) L1.extend(L2) OR B) L2.reverse() *(1 mark for correct answer)*	
25.	(A), (C) *(½ x 2 = 1 Mark)* Minimum and maximum possible values of the variable b: 1,6 *(½ x 2 = 1 Mark)*	(2)
26.	def swap_first_last(tup**):** if len(tup) < 2: **return tup** new_tup = (tup[-1],) + tup[1:-1] + (tup**[0],)** return new_tup result = swap_first_last((1, 2, 3, 4)) print("Swapped **tuple:", result)** (½ mark each for correcting 4 mistakes)	(2)
27.	(I) A) UNIQUE **OR** B) NOT NULL *(1 mark for correct answer)* (II) A) ALTER TABLE MOBILE DROP PRIMARY KEY; OR B) ALTER TABLE MOBILE ADD PRIMARY KEY (M_ID); *(1 mark for correct answer)*	(2)
28.	A) Advantage: Network extension is easy. Disadvantage: Failure of switch/hub results in failure of the network. *(1 mark for correct Advantage)* *(1 mark for correct Disadvantage)* **OR**	(2)

	B) SMTP: Simple Mail Transfer Protocol. SMTP is used for sending e-mails from client to server. *(1 mark for correct expansion)* *(1 mark for correct usage)*	

Q No.	SECTION C (3 X 3 = 9)	Marks

29.	(A)
	def show():
	f=open("Email.txt",'r')
	data=f.read()
	words=data.split()
	for word in words:
	if '@cmail' in word:
	print(word,end=' ')
	f.close()
	(½ mark for correct function header)
	(½ mark for correctly opening the file)
	(½ mark for correctly reading from the file)
	(½ mark for splitting the text into words)
	(1 mark for correctly displaying the desired words)
	OR
	(B)
	def display_long_words():
	with open("Words.txt", 'r') as file:
	data=file.read()
	words=data.split()
	for word in words:
	if len(word)>5:
	print(word,end=' ')
	(½ mark for correct function header)
	(½ mark for correctly opening the file)
	(½ mark for correctly reading from the file)
	(½ mark for splitting the text into words)
	(1 mark for correctly displaying the desired words)
		(3)

30. (A)

(I)

```
def push_book(BooksStack, new_book):
    BooksStack.append(new_book)
```

(II)

```
def pop_book(BooksStack):
    if not BooksStack:
        print("Underflow")
    else:
        return(BookStack.pop())
```

(III)

```
def peep(BooksStack):
    if not BooksStack:
        print("None")
    else:
        print(BookStack[-1])
```

(3x1 mark for correct function body; No marks for any function header as it was a part of the question)

OR

(B)

```
def push_even(N):
    EvenNumbers = []
    for num in N:
        if num % 2 == 0:
            EvenNumbers.append(num)
    return EvenNumbers


VALUES = []

for i in range(5):
    VALUES.append(int(input("Enter an integer: ")))

EvenNumbers = push_even(VALUES)

def pop_even():
    if not EvenNumbers:
        print("Underflow")
    else:
        print(EvenNumbers.pop())

pop_even()
```

(3)

	def Disp_even():
	  if not EvenNumbers:
	  print("None")
	  else:
	  print(EvenNumbers[-1])
	Disp_even()
	(1/2 for identifying even numbers)
	(1/2 mark for correctly adding data to stack)
	(1/2 mark for correctly poping data on the stack and 1/2 mark for checking condition)
	(1/2 mark for correctly displaying the data with none)
	(1/2 mark for function call statements)	

31.	(A) 15@ 7@ 9 OR (B) 1 #2 #3# 1 #2 #3 # 1 # *(1 mark for each correct line of output)* *(deduct ½ mark for not printing @/#)*	(3)

Q No.	SECTION D (4 X 4 = 16)	Marks
32.	(A) (I) select Product, sum(Quantity) from orders group by product having sum(Quantity)>=5; (II) select * from orders order by Price desc; (III) select distinct C_Name from orders; (IV) select sum(price) as total_price from orders where Quantity IS NULL; *(4 x 1 mark for each correct query)* **OR** (B) (I) C_Name | Total_Quantity --- |--- Jitendra | 1 Mustafa | 2 Dhwani | 1	(4)

(II)

```
O_Id | C_Name | Product        | Quantity  | Price
-----  |--------     |------------      |----------    |-------
1002 | Mustafa  | Smartphone | 2           | 10000
1003 | Dhwani   | Headphone  | 1           | 1500
```

(III)

```
O_Id | C_Name   | Product        | Quantity | Price
-----       |----------     |------------      |----------    |-------
1001      | Jitendra    | Laptop         | 1           | 12000
1002      | Mustafa    | Smartphone | 2           | 10000
1003      | Dhwani    | Headphone   | 1           | 1500
```

(IV)

```
MAX(Price)
-----------
12000
```

(4 x *1 mark for each correct output)*

33. (I)

```
def show():
    import csv
    f=open("happiness.csv",'r')
    records=csv.reader(f)
    next(records, None) #To skip the Header row
    for i in records:
        if int(i[1])>5000000:
            print(i)
    f.close()
```

(½ mark for opening in the file in right mode)
(½ mark for correctly creating the reader object)
(½ mark for correctly checking the condition)
(½ mark for correctly displaying the records)

(4)

(II)

```
def Count_records():
    import csv
    f=open("happiness.csv",'r')
    records=csv.reader(f)
    next(records, None) #To skip the Header row
    count=0
    for i in records:
        count+=1
    print(count)
    f.close()
```

	(½ mark for opening in the file in right mode) *(½ mark for correctly creating the reader object)* *(½ mark for correct use of counter)* *(½ mark for correctly displaying the counter)* **Note (**for both parts (I) and (II)**):** *(i) Ignore* **import csv** *as it may be considered the part of the complete program, and there is no need to import it in individual functions.* *(ii) Ignore next(records, None) as the file may or may not have the Header Row.*	
34.	(I) Select * from FACULTY natural join COURSES where Salary<12000; Or Select * from FACULTY, COURSES where Salary<12000 and facuty.f_id=courses.f_id; (II) Select * from courses where fees between 20000 and 50000; (III) Update courses set fees=fees+500 where CName like '%Computer%'; (IV) (A) Select FName, LName from faculty natural join courses where Came="System Design"; Or Select FName, LName from faculty, courses where Came="System Design" and facuty.f_id=courses.f_id; OR (B) Select * from FACULTY, COURSES; *(4x1 mark for each correct query)*	(4)

35.	def AddAndDisplay():
	import mysql.connector as mycon
	mydb=mycon.connect(host="localhost",user="root",
	passwd="Pencil",database="ITEMDB")
	mycur=mydb.cursor()
	no=int(input("Enter Item Number: "))
	nm=input("Enter Item Name: ")
	pr=float(input("Enter price: "))
	qty=int(input("Enter qty: "))
	query="INSERT INTO stationery VALUES ({},'{}',{},{})"
	query=query.format(no,nm,pr,qty)
	mycur.execute(query)
	mydb.commit()
	mycur.execute("select * from stationery where price>120")
	for rec in mycur:
	print(rec)
		(4)

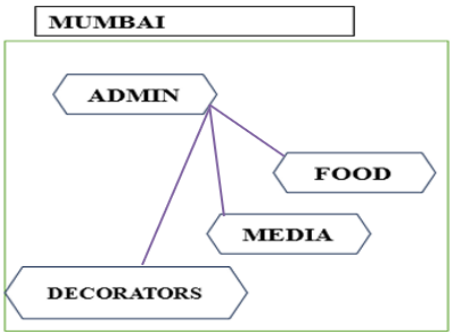
	(½ mark for correctly importing the connector object) *(½ mark for correctly creating the connection object)* *(½ mark for correctly creating the cursor object)* *(½ mark for correctly inputting the data)* *(½ mark for correct creation of first query)* *(½ mark for correctly executing the first query with commit)* *(½ mark for correctly executing the second query)* *(½ mark for correctly displaying the data)*	

Q No.	SECTION E (2 X 5 = 10)	Marks

36.	(I)
	import pickle
	
	def input_candidates():
	  candidates = []
	  n = int(input("Enter the number of candidates you want to add: "))
	  for i in range(n):
	  candidate_id = int(input("Enter Candidate ID: "))
	  candidate_name = input("Enter Candidate Name: ")
	  designation = input("Enter Designation: ")
	  experience = float(input("Enter Experience (in years): "))
	  candidates.append([candidate_id, candidate_name, designation, experience])
	  return candidates
	candidates_list = input_candidates()
	
	def append_candidate_data(candidates):
	  with open('candidates.bin', 'ab') as file:
	  for candidate in candidates:
	  pickle.dump(candidate, file)
	  print("Candidate data appended successfully.")
	
	append_candidate_data(candidates_list)
	
	(II)
	import pickle
	
	def update_senior_manager():
	  updated_candidates = []
	  try:
	  with open('candidates.bin', 'rb') as file:
	  while True:
	  try:
	  candidate = pickle.load(file)
	  if candidate[3] > 10: # If experience > 10 years
	  candidate[2] = 'Senior Manager'
	  updated_candidates.append(candidate)
	  except EOFError:
		(5)

	break # End of file reached
	except FileNotFoundError:
	print("No candidate data found. Please add candidates first.")
	return
	
	with open('candidates.bin', 'wb') as file:
	for candidate in updated_candidates:
	pickle.dump(candidate, file)
	
	print("Candidates updated to Senior Manager where applicable.")
	update_senior_manager()
	
	(III)
	
	import pickle
	
	def display_non_senior_managers():
	try:
	with open('candidates.bin', 'rb') as file:
	while True:
	try:
	candidate = pickle.load(file)
	if candidate[2] != 'Senior Manager': # Check if not Senior Manager
	print(f"Candidate ID: {candidate[0]}")
	print(f"Candidate Name: {candidate[1]}")
	print(f"Designation: {candidate[2]}")
	print(f"Experience: {candidate[3]}")
	print("----------")
	except EOFError:
	break # End of file reached
	except FileNotFoundError:
	print("No candidate data found. Please add candidates first.")
	
	display_non_senior_managers()
	
	(1/2 mark of import pickle)
	(1/2 mark for input)
	(1/2 mark for opening file in append mode and 1/2 mark for using dump)
	(1/2 mark for opening file in read mode and 1/2 mark for using load)
	(1 mark for checking the condition and updating the value)
	(1 mark for checking the condition and displaying data correctly)	

37.	(I) ADMIN Block as it has maximum number of computers. *(1 mark for correct answer)* (II) Switch *(1 mark for correct answer)* (III)	(5)



(or Any other correct layout)

Cable: Coaxial cable

(½ mark for correct layout + ½ mark for correct table type)

(IV) There is no requirement of the Repeat as the optical fibre cable used for the network can carry the data to much longer distances than within the campus.

(1 mark for correct answer)

(V) (A) a) Video Conferencing

OR

(B) LAN

(1 mark for correct answer)