



COMMON PRE-BOARD EXAMINATION
COMPUTER SCIENCE-Code No. 083
Class-XII-(2025-26)



SET: 1

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 25: <pre>import statistics statistics.mean([10, 20, 30, 40])</pre>	1
2	<pre>text = "Welcome-to-the-world-of-Python" a = text.split('-', 3) b = text.partition('the') print(a[-1], b[1], b[2].split('-')[1])</pre>	1
3	Consider the given expression: <pre>print(not (10 < 5 and 3 > 1) or (7 == 7 and not 4 < 2))</pre> Which of the following will be the correct output of the given expression? a) True b) False c) Null d) No output	1
4	Which of the following joins returns rows from both tables where the values in the specified columns are equal? a) Natural Join b) Equi Join c) Outer Join d) Cross Join	1
5	<pre>dict={"A":3,"b":2,"d":1,"z":0} print(max(dict))</pre> a)A b)3 c)z d)Error	1

6	Write the output of the following Python code : for x in range(3, 18, 5): print(str(x) + str(x//2), end='*')	1
7	What will be the output of the following Python statement: print(100 / 5 * 2 + (3 - 2)**3 - 4)	1
8	Jaanvi wants to list all employees who do not have any manager assigned to them. She wrote the following SQL query: SELECT * FROM employees WHERE manager_id = NULL; The query does not give the correct result. Rewrite the query correctly.	1
9	What will be the output of the following Python code? try: a = int("Hello") except (ValueError, TypeError): print("Error occurred") else: print("No error") finally: print("Finally block") a) Error occurred b) Error occurred Finally block c) Finally block d) No error	1
10	What will be the output of the following Python code? msg = "DATAPROCESSING" msg = msg.replace('A','@') msg = msg.replace('P','#',1) print(msg) a) D@T@ROCESSING b) D@T@#ROCESSING c) D@T@R#OCESSING d) D@T@R0CESSING	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 A = [2, 4, 6, 8, 10] m = random.randint(0, 1) n = random.randint(3, 4) for i in range(m, n): print(A[i], end="*") a) 2*4*6*8* b) 4*6*8* c) 4*6* d) All the given	1
12	What will be the output of the following Python code? i = 5 print(i, end='@@@') def add():	1

	<pre> global i i = i + 7 print(i, end='###') add() print(i) </pre> <p>a) 5@@@12###15 b) 5@@@5###12 c) 5@@@12###12 d) 12@@@12###12</p>	
13	<p>Which situation best represents data redundancy in an RDBMS?</p> <p>a) Same value stored repeatedly in different rows due to denormalized design b) Multiple users accessing the same record at the same time c) A foreign key pointing to a primary key in another table d) A table having more than one candidate key</p>	1
14	<p>What is the output of the given Python code?</p> <pre> st = 'Miissippi' print(st.split("i")) </pre> <p>a) ['M', 'ss', 'ss', 'pp', " b) ['M', ", 'ss', 'ss', 'pp', " c) ['M', 'i', 'ss', 'ss', 'pp', " d) Error</p>	1
15	<p>A table EMP has 12 rows and 7 columns. After executing: UPDATE EMP SET Salary = Salary + 1000 WHERE Department='HR'; 3 rows are updated. What are the new cardinality and degree of the table?</p> <p>a) Cardinality = 9, Degree = 7 b) Cardinality = 12, Degree = 7 c) Cardinality = 15, Degree = 7 d) Cardinality = 12, Degree = 10</p>	1
16	<p>Which SQL command permanently deletes a table along with all of its data and structure from the database?</p> <p>a) DELETE b) DROP c) TRUNCATE d) REMOVE</p>	1
17	<p>_____ is a protocol that allows a user to remotely log in to another computer.</p> <p>a) HTTP b) TELNET c) FTP d) SMTP</p>	1
18	<p>Which of the following statements about IP addressing is incorrect?</p> <p>a) Each device on a network must have a unique IP address. b) IP address consists of 32 bits divided into four octets. c) IP address identifies the physical hardware of a device. d) None</p>	1
19	<p>A user types https://cbseacademic.nic.in/result.html in a web browser. Which part represents the protocol?</p>	1

	<p>a) cbseacademic.nic.in b) result.html c) https d) www</p>	
	<p>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.</p>	
20	<p>Assertion (A): A list can contain a tuple as an element, but a tuple cannot contain a list as an element. Reason (R): Lists are mutable, while tuples are immutable, so tuples cannot store mutable objects.</p>	1
21	<p>Assertion (A): Every Primary Key is a Candidate Key, but every Candidate Key is not necessarily a Primary Key. Reason (R): Among all Candidate Keys, one key is chosen as the Primary Key to uniquely identify records.</p>	1
Q No.	Section-B (7 x 2=14 Marks)	Marks
22	<p>A. Differentiate between List and Tuple in Python with respect to mutability and performance, using an example for each. OR B. Can a tuple contain a mutable object such as a list? Justify your answer with a suitable example.</p>	2
23	<p>The following code is intended to find the sum of all even numbers present in a list. However, the code contains syntax and logical errors. Rewrite the code after removing all the errors and underline all the corrections made.</p> <pre>def even_sum(num_list) total = 0 for n in num_list: if n % 2 = 0 total = total + n return total numbers = [3, 8, 5, 12, 7, 10] print("Sum of even numbers:" even_sum(numbers))</pre>	2
24	<p>A. What will be the output of following code-</p> <pre>D = dict() for i in range (3): for j in range(2): D[i] = j print(D)</pre>	2

	<p>B. What will be the output of following program:</p> <pre>dict1 = {"key1":1, "key2":2} dict2 = {"key2":2, "key1":1} print(dict1 == dict2)</pre>	
25	<p>A. Write a Python function <code>remove_duplicate()</code> that accepts a list L and removes all duplicate elements from the list while keeping only the first occurrence of each element. The function should then print the updated list.</p> <p style="text-align: center;">OR</p> <p>B. Write a Python function <code>update_marks()</code> that accepts a dictionary marks, a student's name, and new marks.</p> <ul style="list-style-type: none"> • If the student exists in the dictionary, update the marks. • If the student does not exist, print "Student not found". 	2
26	<p>A. What will be the output of following program:</p> <pre>a = {} a[1] = 1 a['1'] = 2 a[1.0] = 4 count = 0 for i in a: count += a[i] print(count)</pre> <p>B. What will be the output of following program:</p> <pre>box = {} jars = {} crates = {} box['biscuit'] = 1 box['cake'] = 3 jars['jam'] = 4 crates['box'] = box crates['jars'] = jars print(len([crates]))</pre>	2
27	<p>A. Write suitable SQL commands to do the following:</p> <p>I. Display all records of the table EMPLOYEE in descending order of SALARY.</p> <p>II. Add a new column EMAIL of data type VARCHAR(50) to the table EMPLOYEE.</p> <p style="text-align: center;">OR</p> <p>B. Differentiate between ALTER TABLE and UPDATE commands in SQL with a suitable example.</p>	2
28	<p>A. Define the following terms:</p> <p>I. Switch</p> <p>II. Hub</p> <p style="text-align: center;">OR</p> <p>B.</p> <p>I. Expand the following terms: WAN and PAN</p> <p>II. Differentiate between Star topology and Bus topology.</p>	2

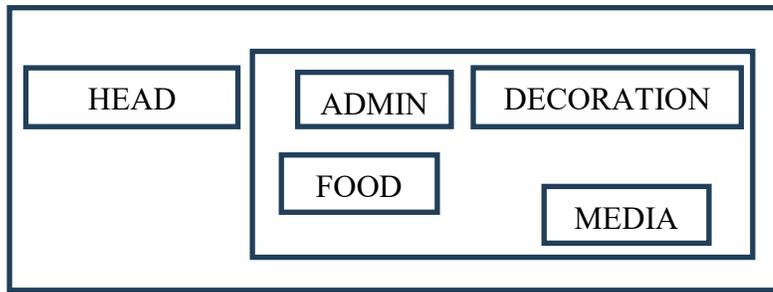
No.	Section-C (3 x 3 = 9 Marks)	Marks
29	<p>A. Write a Python function that reads a text file "Data.txt" and displays the total number of vowels (A, E, I, O, U) present in the file (case-insensitive).</p> <p style="text-align: center;">OR</p> <p>B. Write and call a Python function to read "Data.txt" and display only those lines that do not contain any digits.</p>	3
30	<p>A list of student records is given: L = [("Ravi", 85), ("Neha", 92), ("Amit", 45), ("Sana", 78)] Write the following user-defined functions to perform stack operations on a stack named Student:</p> <p>I. Push_element() — This function should push into the stack only those student records whose marks are greater than 90. <i>Expected stack after push:</i> [('Neha', 92)]</p> <p>II. Pop_element() — This function should pop and display the elements of the stack one by one. After all elements are popped, the function should display "Stack Empty". <i>Expected output:</i> ('Neha', 92) Stack Empty</p>	3
31	<p>A. Predict the output of the following Python code:</p> <pre>text = "CS083" result = "" for ch in text: if ch.isdigit(): result += str(int(ch) + 1) elif ch.isalpha(): result += ch.lower() else: result += "*" print(result)</pre> <p style="text-align: center;">OR</p> <p>B.</p> <pre>languages = ["Python", "C", "Java", "Perl", "Go"] out = [] for lang in languages: if lang[-1] not in "aeiouAEIOU": out.append(lang[:2].upper()) print(out)</pre>	3

Q No.	Section-D (4 x 4 = 16 Marks)	Marks																														
32	<p>Consider the table PRODUCTS (Sample):</p> <table border="1" data-bbox="277 243 1086 474"> <thead> <tr> <th>PID</th> <th>ProductName</th> <th>Category</th> <th>Price</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>P01</td> <td>Mouse</td> <td>Accessory</td> <td>40</td> <td>25</td> </tr> <tr> <td>P02</td> <td>Keyboard</td> <td>Accessory</td> <td>900</td> <td>18</td> </tr> <tr> <td>P03</td> <td>Laptop</td> <td>Device</td> <td>55000</td> <td>10</td> </tr> <tr> <td>P04</td> <td>Printer</td> <td>Device</td> <td>7500</td> <td>8</td> </tr> <tr> <td>P05</td> <td>Tablet</td> <td>Device</td> <td>180</td> <td>20</td> </tr> </tbody> </table> <p>A. Write SQL queries to:</p> <ol style="list-style-type: none"> Display total quantity for each category where total quantity > 15. Display names of all products having 'a' as the second character. Display all records sorted by Price in ascending order. Display the different Category names. <p style="text-align: center;">OR</p> <p>B. Predict the output of the following SQL queries:</p> <ol style="list-style-type: none"> SELECT ProductName FROM PRODUCTS WHERE Category='Device' AND Price>20000; SELECT COUNT(*) FROM PRODUCTS WHERE ProductName LIKE '%e'; SELECT MAX(Price) FROM PRODUCTS WHERE Category='Accessory'; SELECT AVG(Price) FROM PRODUCTS WHERE Quantity BETWEEN 20 AND 30; 	PID	ProductName	Category	Price	Quantity	P01	Mouse	Accessory	40	25	P02	Keyboard	Accessory	900	18	P03	Laptop	Device	55000	10	P04	Printer	Device	7500	8	P05	Tablet	Device	180	20	4
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33	<p>A cafe maintains its billing information in a CSV file Orders.csv. Each record stores: Order_ID, Item, Quantity, Rate.</p> <p>Write user-defined functions to:</p> <ol style="list-style-type: none"> InsertOrder() – to accept a new order and append it to the file Orders.csv. GenerateBill() – to read the file and calculate the total bill amount for all orders (Quantity × Rate) and return the final amount. 	4																														
34	<p>Shekar is handling the Medical Research University database. He needs to access and update data from two tables — DOCTOR and PROJECTS — to prepare a compliance report.</p> <p>Table: DOCTOR</p> <table border="1" data-bbox="277 1612 1252 1839"> <thead> <tr> <th>D_ID</th> <th>FName</th> <th>LName</th> <th>Join_Date</th> <th>Honorarium</th> </tr> </thead> <tbody> <tr> <td>201</td> <td>Kavita</td> <td>Sharma</td> <td>10-03-2000</td> <td>45000</td> </tr> <tr> <td>202</td> <td>Arjun</td> <td>Mehta</td> <td>22-07-1998</td> <td>52000</td> </tr> <tr> <td>203</td> <td>Nisha</td> <td>Verma</td> <td>15-01-2005</td> <td>38000</td> </tr> <tr> <td>204</td> <td>Rohan</td> <td>Kapoor</td> <td>06-11-2010</td> <td>60000</td> </tr> <tr> <td>205</td> <td>Meera</td> <td>Joshi</td> <td>19-09-2004</td> <td>43000</td> </tr> </tbody> </table>	D_ID	FName	LName	Join_Date	Honorarium	201	Kavita	Sharma	10-03-2000	45000	202	Arjun	Mehta	22-07-1998	52000	203	Nisha	Verma	15-01-2005	38000	204	Rohan	Kapoor	06-11-2010	60000	205	Meera	Joshi	19-09-2004	43000	4
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	<p>Table: PROJECTS</p> <table border="1" data-bbox="277 138 1159 407"> <thead> <tr> <th>P_ID</th> <th>D_ID</th> <th>PName</th> <th>Budget</th> </tr> </thead> <tbody> <tr> <td>P01</td> <td>204</td> <td>Neuro Imaging</td> <td>150000</td> </tr> <tr> <td>P02</td> <td>201</td> <td>Cancer Cell Analysis</td> <td>70000</td> </tr> <tr> <td>P03</td> <td>203</td> <td>Clinical Trials Pharma</td> <td>90000</td> </tr> <tr> <td>P04</td> <td>205</td> <td>Brain-Computer Interface</td> <td>60000</td> </tr> <tr> <td>P05</td> <td>202</td> <td>Covid Vaccine Review</td> <td>200000</td> </tr> <tr> <td>P06</td> <td>204</td> <td>AI in Surgery</td> <td>80000</td> </tr> </tbody> </table> <p>I. Display full records (from both tables) of those doctors whose honorarium is between 40000 and 55000.</p> <p>II. Display details of all projects whose Budget is not between 60000 and 100000.</p> <p>III. Increase the budget by 10% of all projects that have the word “AI” anywhere in their project name.</p> <p>IV.</p> <p>A. Display first name & last name of doctor working on a project named “Neuro Imaging”</p> <p style="text-align: center;">OR</p> <p>B. Display the Cartesian Product of DOCTOR and PROJECTS.</p>	P_ID	D_ID	PName	Budget	P01	204	Neuro Imaging	150000	P02	201	Cancer Cell Analysis	70000	P03	203	Clinical Trials Pharma	90000	P04	205	Brain-Computer Interface	60000	P05	202	Covid Vaccine Review	200000	P06	204	AI in Surgery	80000	
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35	<p>A MySQL database LibraryDB contains a table issued_books with attributes:</p> <ul style="list-style-type: none"> • IssueID (Integer) • BookTitle (String) • MemberID (Integer) • DueDate (Date) <p>Connector parameters are:</p> <ul style="list-style-type: none"> • Username: librarian • Password: lib#2025 • Host: localhost <p>Write a Python program to delete the record having IssueID = 503 from the table and display a message “Record Deleted” only if exactly one row was removed.</p>	4																												
Q No.	Section-E (2 X 5 = 10 Marks)	Marks																												
36	<p>A company stores student fee records in a binary file named fees.dat. Each record contains: Roll_No, Student_Name, Course, Fee_Paid.</p> <p>Write Python functions to:</p> <p>I. Add new fee records to the binary file.</p> <p>II. Read the file and increase Fee_Paid by 10% for all students enrolled in the course "BTech", and write back the updated records to the same file.</p>	2+3																												
37	<p>Fun Media Services Ltd 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, DECORATORS, FOOD, and MEDIA.</p> <p>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.</p>	5																												

DELHI

MUMBAI



Shortest distance between various buildings:

FROM	DISTANCE
ADMIN TO DECORATORS	90m
ADMIN TO MEDIA	75m
ADMIN TO FOOD	50m
DECORATORS TO FOOD	65m
DECORATORS TO MEDIA	50m
FOOD TO MEDIA	45m
DELHI HEAD OFFICE TO MUMBAI CAMPUS	1475m

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

BUILDING	NUMBER OF COMPUTERS
ADMIN	110
DECORATORS	75
MEDIA	12
FOOD	20

- I. Suggest the most appropriate location of the server inside the MUMBAI campus (out of the 4 buildings). Justify your answer.
- II. Draw the cable layout to efficiently connect various buildings within the MUMBAI campus.
- III. Which hardware device will you suggest to connect all the computers within each building?
- IV. Which of the following will you suggest to establish online face-to-face communication between the people in the Admin Office of the MUMBAI campus and the DELHI Head Office?
 - a. Cable TV
 - b. Email
 - c. Video Conferencing
 - d. Text Chat
- V. What type of network (out of PAN, LAN, MAN, WAN) will be set up in each of the following cases?
 - a. The Mumbai campus gets connected with the Head Quarter in Delhi
 - b. The computers connected in the MUMBAI campus
