

Time Allowed: 3 hours

- This question paper contains 37 questions.
- All questions are compulsory.
- 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 the case of MCQ, the text of the correct answer should also be written.

Page 1

	(a) student[1][1]=27 (c) student_1=27	(b) student[1].update(27) (d) None of the above	
Q6.	Fill in the blank: _____ is a communication methodology designed to deliver both voice and multimedia communications over Internet protocol. (a) VoIP (b) SMTP (c) PPP (d) HTTP		1
Q7.	Which function is used to display the total number of records from a table in a database? (a) sum(*) (b) total(*) (c) count(*) (d) return(*)		1
Q8.	Which of these is not a communication channel? (a) Wi-Fi (b) Microwave (c) Radio wave (d) Satellite		1
Q9.	What will be the output of the following statement ? "TEST".split("T", 1) (a) [' ', 'ES', ' '] (b) ['T', 'ES', 'T '] (c) [' ', 'EST'] (d) Error		1
Q10.	_____ is a constraint applied on any column to ensure that all values are different. (a) Primary Key (b) Unique (c) Not Null (d) both a and b		1
Q11.	Consider the following dictionaries, D and D1: D={"Suman": 40, "Raj": 55, "Raman": 60} D1={"Aditi": 30, "Amit":90., "Raj":20} Which statement will be used to display/return the value corresponding to the key "Raj" in the dictionary D (a) print(D1[2]) (b) print(D["Raj"]) (c) print(D1["RAJ"]) (d) both b and c		1
Q12.	If you want to remove a table from the database, which of the following SQL commands can be used? a) DROP table tablename; b) REMOVE table tablename; c) DEL table tablename; d) None of the above		1
Q13.	In _____ switching, before a communication starts, a dedicated path is identified between the sender and the receiver. a) Packet b) Graph c)Circuit d) Plot		1
Q14.	Which of the following function calls will result in error while executing the function Message? def Message(N,T): for C in range(N): print((C+1)*T) (a) n=10; t1=""; t2="#"; Message(n,t1+t2)		1

	(b) Message(5, 2*"Help!"*3) (c) count=15//2; Message(count,"Finally Over") (d) Message((2*"#")+"\$",23)	
Q15.	To establish a connection between Python and SQL databases,connect() is used. Which of the following arguments may not necessarily be given while calling connect() ? (a) host (b) database (c) user (d) password	1
Q16.	Which of the following options can be used to read the first line of a text file Contactsfile.txt? (a) CF = open('Contactsfile.txt'); print(CF.read(n)) (b) CF = open('Contactsfile.txt','r'); print(CF.read()) (c) CF = open('Contactsfile.txt'); print(CF.readline()) (d) CF = open('Contactsfile.txt'); print(CF.readlines())	1
Q17.	When a stack, implemented as an array/list of fixed size, is full and no new element can be accommodated, it is called an _____. a) OVERFLOW b) NOFLOW c) EXTRAFLOW d) UNDERFLOW	
Q18.	Which transmission media is capable of having a much higher bandwidth (data capacity)? a) Untwisted cable b) Twisted pair cable c) Fibre optic d) Coaxial	
Q19.	What will be the output of the following Python code? try: x = 99 / 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
Q20 and Q21 are ASSERTION AND REASONING 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		
Q20.	Assertion (A): Binary file is a file format which has non-human readable data form. Reason (R) : The information is organized with one record on each line and each field is separated by comma.	1

Q21.	Assertion (A): Default values indicate that the function argument will take that value if no argument value is passed during function call. Reason (R) : The default value is assigned by using assignment (=) operator in the function definition.	1
Section -B		
Q22.	Observe the following Python code and answer the questions below assuming the table STUDENT is containing 51 rows in it. <pre> CUR= db.cursor() MYSQL="SELECT Rno, Name FROM STUDENT" CUR.execute(MYSQL) REC=CUR.fetchall() print(len(REC)) </pre> (a) What will be the output of the code? (b) What will be the datatype of the R object after the given command is executed?	2
Q23.	Write two points of difference between Bus topology and Star topology. OR Write two points of difference between Wireless and Wired communication medium.	2
Q24.	(a) Given the following tuple : <pre> def func(first , second=100, third=200): first,second,third= second+third,first+1,second return first, third, second Value=func(10,"happy","!!!") a, b, c =func(120) print(Value,\n', c,a,sep=') </pre> (b) Consider the following string : <pre>str="Computer Science 2025"</pre> Write the output of following code : <pre>print(str[::-2]+str[-10:-4:2])</pre>	2
Q25.	What are constraints in SQL? Explain with the help of an example.	2
Q26.	(a) Write the full forms of the following: (i) VOIP (ii) XML (b) What is the role of TCP/IP in computer networking?	2
Q27.	Predict the output of the following code: <pre> def Data(S): S.clear() </pre>	2

	<pre> S.extend((500,600,700)) S.insert(1,2) Number = S[1:-1] S[0] = 111 print("Inside the function :", Number) X= [100, 200, 300, 400] Data(X) print("Inside the main program:", X) </pre>	
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Q28.	Differentiate between DML and DDL commands with respect to SQL.	2
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Section -C

Q29.

(a) Consider the tables given below :

3

Customer

Custno	Custname	City
C100	Amar Sharma	New Delhi
C101	Richa Gupta	Bangalore
C102	Sheena	Mumbai

Transaction

Trno	Custno	Tr_details
1001	C101	Credit
1002	C101	Debit
1003	C102	Credit

What will be the output of the following query:
SELECT * FROM CUSTOMER NATURAL JOIN TRANSACTION;

(b) Consider the following table and answer the following queries :

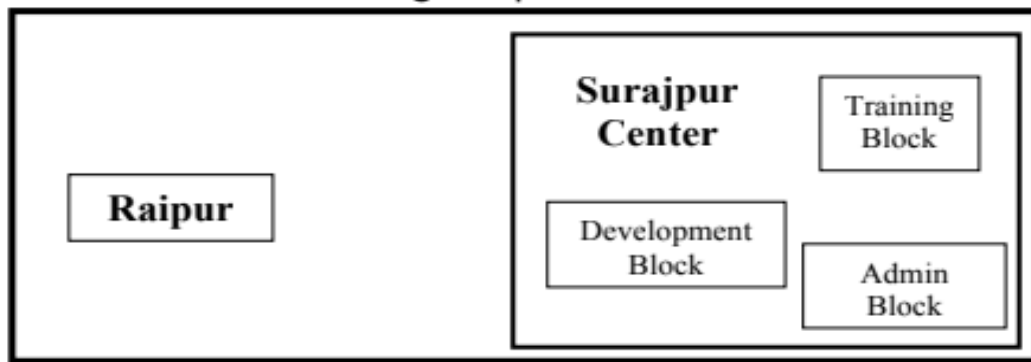
Table: Pharma

MID	MNAME	PRICE	UNITS	EXPIRY
M1	PARACETAMOL	12	120	2025-12-25

	<table><tr><td>M2</td><td>CETRIZINE</td><td>6</td><td>125</td><td>2025-10-12</td></tr><tr><td>M3</td><td>METFORMIN</td><td>14</td><td>150</td><td>2025-12-25</td></tr><tr><td>M4</td><td>VITAMIN B-6</td><td>12</td><td>120</td><td>2025-07-01</td></tr><tr><td>M5</td><td>VITAMIN D3</td><td>25</td><td>NULL</td><td>2025-10-12</td></tr><tr><td>M6</td><td>TELMISARTAN</td><td>22</td><td>115</td><td>2025-02-25</td></tr></table> a) SELECT MNAME FROM PHARMA WHERE PRICE>12 ORDER BY MNAME; b) SELECT MNAME,UNITS FROM PHARMA WHERE UNITS IS NULL; c) SELECT EXPIRY, COUNT(*) FROM PHARMA GROUP BY EXPIRY; d) SELECT * FROM PHARMA WHERE MNAME LIKE "%N";	M2	CETRIZINE	6	125	2025-10-12	M3	METFORMIN	14	150	2025-12-25	M4	VITAMIN B-6	12	120	2025-07-01	M5	VITAMIN D3	25	NULL	2025-10-12	M6	TELMISARTAN	22	115	2025-02-25	
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M5	VITAMIN D3	25	NULL	2025-10-12																							
M6	TELMISARTAN	22	115	2025-02-25																							
Q30.	Write a function displaywords() in Python, which should read the entire text file “SAMPLE.TXT”and then display the words starting with “k” or “m” individually. Example: If the file content is as follows: Where there is a will, there is a way. If there is a chance in a million that you can do something, anything, to keep what you want from ending, do it. Output: Words starting with “k” : keep Words starting with “m” : million	3																									
Q31	Write a function ChangePosition(Player), which accepts a list Player containing names of players and changes the sequence of names by swapping the pair of neighboring names. For example: If Player contains [“Ramaya”, “Jen”, “Sia”, “Shalini”, “Sabeena”, “Pawan”] Then list should now look like : [“Jen”, “Ramaya”, “Shalini”, “Sia”, “Pawan”, “Sabeena”]	3																									
Section -D																											
Q32.	Monica has created the following dictionary containing Indian names of some herbs and their corresponding names in English: Herbs={'Adrak': 'Ginger', 'Amla': 'Gooseberry', 'Babool': 'Indian Gum', 'Dhania': 'Coriander', 'Lahsun': 'Garlic', 'Tulsi': 'Basil'} Write a program, with separate user defined functions to perform the following operations: a) Push the item (key, value pair) of the dictionary into a stack, where the corresponding value (English name) starts with 'G'. b) Pop and display the contents of the stack.	4																									

	OR A stack, named ClrStack, contains records of some colors. Each record is represented as a tuple containing four elements ColorName, RED, GREEN, BLUE. ColorName is a string, and RED, GREEN, BLUE are integers. For example, a record in the stack may be ('Yellow', 237, 250, 68) Write the following user-defined functions in Python to perform the specified operations on ClrStack: - push_Clr(ClrStack, new_Clr): This function takes the stack ClrStack and a new record new_Clr as arguments and pushes this new record onto the stack. - pop_Clr(ClrStack): This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display the message "Underflow".	
Q33	A file, PASSENGER.DAT, stores the records of passengers using the following structure : [PNR, PName, BRDSTN, DESTN, FARE] where: PNR — Passenger Number (string type) PName — Passenger Name (string type) BRDSTN — Boarding Station Name (string type) DESTN — Destination Station Name (string type) FARE — Fare amount for the journey (float type) Write user defined functions in Python for the following tasks: (i) Create () — to input data for passengers and write it in the binary file PASSENGERS.DAT. (ii)UpdateFare() — to increase the fare of all passengers by 5% and rewrite the updated records into the file PASSENGERS.DAT.	4
Q34	A csv file "P_record.csv" contains the record of patients in a hospital. Each record of the file contains the following data: • Name of a patient • Disease • Number of days patient is admitted • Amount For example, a sample record of the file may be: ["Gunjan", "Jaundice", 4,15000] Write the following Python functions to perform the specified operations on this file: (i) Write a function read_data() which reads all the data from the file and displays the details of all the 'Cancer' patients.	4

	(ii) Write a function count_rec() which counts and returns the number of records in the file																																					
Q35	Garima creates a table STUDENT with a set of records to maintain the marks secured by students in weekly tests. After creation of the table, she has entered data of 5 students in the table. Table: STUDENT <table><tr><th>Admno</th><th>Rollno</th><th>Name</th><th>WT1</th><th>WT2</th><th>WT3</th></tr><tr><td>10110</td><td>1</td><td>Manav</td><td>33</td><td>22</td><td>26</td></tr><tr><td>10113</td><td>2</td><td>Shiva</td><td>18</td><td>32</td><td>33</td></tr><tr><td>10117</td><td>3</td><td>Richa</td><td>34</td><td>31</td><td>34</td></tr><tr><td>10200</td><td>4</td><td>Simarpreet</td><td>31</td><td>25</td><td>22</td></tr><tr><td>10910</td><td>5</td><td>Rajender</td><td>27</td><td>31</td><td>33</td></tr></table> Based on the data given above answer the following questions: (i) Identify the most appropriate column, which can be considered as Primary key. (ii) If two columns are added and 2 rows are deleted from the table result, what will be the new degree and cardinality of the above table? (iii) Write the statements to: a. Insert the following record into the table Admno-10110, Roll No-108, Name-Aadit, WT1-33, WT2-31, WT3-28 b. Increase the WT2 marks of the students by 3% whose name begins with 'N'. OR (Option for part iii only) (iii) Write the statements to: a. Delete the record of students securing marks in WT2 more than 25 b. Add a column REMARKS in the table with data type as varchar with 50 characters	Admno	Rollno	Name	WT1	WT2	WT3	10110	1	Manav	33	22	26	10113	2	Shiva	18	32	33	10117	3	Richa	34	31	34	10200	4	Simarpreet	31	25	22	10910	5	Rajender	27	31	33	4
Admno	Rollno	Name	WT1	WT2	WT3																																	
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10117	3	Richa	34	31	34																																	
10200	4	Simarpreet	31	25	22																																	
10910	5	Rajender	27	31	33																																	
Section -E																																						
Q36.	FutureTech Corporation, a Bihar based IT training and development company, is planning to set up training centers in various cities in the coming year. Their first center is coming up in Surajpur district. At Surajpur center, they are planning to have 3 different blocks - one for Admin, one for Training and one for Development. Each block has a number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultant of this company, you have to suggest the best network related solutions for them for issues/problems raised in question nos. (i) to (v), keeping in mind the distances between various blocks/locations and other given parameters.	5																																				



Distance between various blocks/locations

Block	Distance
Development To Admin	28m
Development To Training	105m
Admin To Training	32m
Surajpur Campus To Coimbatore Campus	340km

Number of computers

Block	No. of computers
Development	90
Training	40
Admin	50

- Suggest the most appropriate block/location to house the SERVER in the Surajpur center (out of the 3 blocks) to get the best and effective connectivity. Justify your answer.
- Suggest why should a firewall be installed at the Surajpur Center?
- Suggest the best wired medium and draw the cable layout (Block to Block) to most efficiently connect various blocks within the Surajpur Center.
- Suggest the placement of the following devices with appropriate reasons:
 - Switch/Hub
 - Router
- Suggest the best possible way to provide wireless connectivity between Surajpur Center and Raipur Center.

Q37. (a) Predict the output of the code given below:

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def ExamOn(mystr) :
    newstr = ""
    count = 0
    for i in mystr:
        if count%2 != 0:
            newstr = newstr + str(count-1)
        else:
            newstr = newstr + i.lower()
        count+= 1
    newstr = newstr + mystr[:2]
    print("The new string is:", newstr)
ExamOn("GenAlpha")

```

(b) A table, named STATIONERY, in ITEMDB database, has the following structure:

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

Write the python program to input details of an item and store it in the table STATIONERY. The program 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