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 In Python, a dictionary is an ordered collection of items(key:value pairs).	1
2	State the output of the following L1=[1,2,3] L2=L1 L1.append(7) L2.insert(2,14) L1.remove(1) print(L1) i) [1,3,7] ii) [2,3,7] iii) [1,14,3,7] iv) [2,14,3,7]	1
3	The following expression will evaluate to print(2+(3%5)**1**2/5+2) i) 5 ii) 4.6 iii) 5.8 iv) 4	1
4	What is the output of the expression? Food='Chinese Continental' print(food.split('n')) i) ('', 'hinese ', 'ontinental') ii) ['', 'hinese ', 'ontinental'] iii) ('hinese ', 'ontinental') iv) ['hinese ', 'ontinental']	1
5	What will be output of the following code snippet? Msg='Wings of Fire!' print (Msg[-9: :2])	1
6	What will be the output of the following: T1=(10) print(T1*10) i) 10 ii) 100 iii)(10,10) iv(10,)	1
7	If farm is a t as defined below, then which of the following will cause an exception? farm={'goat':5,'sheep':35,'hen'=10,'pig='7'} i) print(str(farm)) ii) print(farm['sheep','hen']) iii) print(farm.get('goat)) iv) farm['pig']=17	1
8	What does the replace('e','h') method of string does? i) Replaces the first occurrence of 'e' to 'h'	1

	ii) Replaces the first occurrence of 'h' to 'e' iii) Replace all occurrences of 'e' to 'h' iv) Replaces all occurrences of 'h' to 'e'	
9	If a table has 1 primary key and 3 candidate key, how many alternate keys will be in the table. i) 4 ii) 3 iii)2 iv)1	1
10	Write the missing statement to complete the following code ``` file = open("story.txt") t1 = file.read(10) _____#Move the file pointer to the beginning of the file t2= file.read(50) print(t1+t2) file.close() ```	1
11	Which of the following keyword is used to pass the control to the except block in Exceptional handling? i) pass ii) finally iii) raise iv)throw	1

12	What will be the output of the following code:
	
	``
	sal = 5000
	def inc_sal(per):
	    global sal
	    inc = sal * (per / 100)
	    sal += inc
	inc_sal(10)
	print(sal,end='%')
	sal=6000
	print(sal,end='$')
	``
	
	i) 5000%6000$
	ii) 5500.0%6000$
	iii) 5000.0$6000%
	iv) 5500%5500$
		1

13	State the sql command used to add a column to an existing table?	1

14	What will be the output of the following query?
	Mysql> SELECT * FROM CUSTOMER WHERE CODE LIKE '_A%'
	   A) Customer details whose code's middle letter is A
	   B) Customers name whose code's middle letter is A
	   C) Customers details whose code's second letter is A
	   D) Customers name whose code's second letter is A
		1

15	Sushma created a table named Person with name as char(20) and address as varchar(40). She inserted a record with "Adithya Varman" and address as "Vaanam Illam, Anna Nagar IV Street". State how much bytes would have been saved for this record. i)(20,34) ii)(30,40) iii)(14,40) iv)14,34)	1
16	_____ gives the number of values present in an attribute of a relation. a)count(distinct col) b)sum(col) c)count(col) d)sum(distinct col)	1
17	The protocol used identify the corresponding url from ip address is _____ a)IP b)HTTP c)TCP d)FTP	1
18	The device used to convert analog signal to digital signal and vice versa is .. a)Amplifier b)Router c)Modem d)Switch	1
19	In _____ switching technique, data is divided into chunks of packets and travels through different paths and finally reach the destination.	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) : A function can have multiple return statements	1

	Reason (R) : Only one return gets executed Values are returned as a tuple.	
21	Assertion (A) : Truncate is a DML command Reason(R) : It is used to remove all the content of a database object	1

Q No.	Section-B (7 x 2=14 Marks)	Marks
22	Differentiate list and tuple with respect to mutability. Give suitable example to illustrate the same .	2
23	Give two examples of each of the following a) Assignment operators b) Logical operators	2

24	If L1 = [13,25,41,25,63,25,18,78] and L2= [58,56,25,74,56]
	    (i) A) Write a statement to remove fourth element from L1
	       Or
	      B) Write the statement to find maximum element in L2
	
	(ii) (A) write a statement to insert L2 as the last element of L1
	OR
	(B) Write a statement to insert 15 as second element in L2
		2

25	Identify the correct output(s) of the following code. Also write the minimum and the maximum possible values of the variable Lot
	
	   import random
	   word='Inspiration'
	   Lot=2*random.randint(2,4)
	   for i in range(Lot,len(word),3):
	     print(word[i],end='$')
	
	   i) iain ii) in
	   iii) itn$ iv) ain$
		2

26	Identify Primary Key and Candidate Key present if any in the below table name Colleges. Justify	2

Cid	Name	Location	Year	Strength	AffiUniv	PhoneNumber
1	St. Xavier's College	Mumbai	1869	10000	University of Mumbai	022-12345678
2	Loyola College	Chennai	1925	5000	University of Madras	044-87654321
3	Hansraj College	New Delhi	1948	4000	Delhi University	011-23456789
4	Christ University	Bengaluru	1969	8000	Christ University	080-98765432
5	Lady Shri Ram College	New Delhi	1956	2500	Delhi University	011-34567890

| 27 | (I)
(A) What constraint/s should be applied to the column in a table to make it as alternate key?
OR
(B) What constraint should be applied on a column of a table so that it becomes compulsory to insert the value
(II)
(A) Write an SQL command to assign F_id as primary key in the table named flight
OR | 2 |

	(B)Write an SQL command to remove the column remarks from the table name customer.	
28	List one advantage and disadvantage of star and bus topology OR Define DNS and state the use of Internet Protocol.	2

Q No.	Section-C (3 x 3 = 9 Marks)	Marks
29	(A) Write a function that counts no of words beginning with a capital letter from the text file RatanJi.txt Example: If you want to Walk Fast, Walk Alone. But - if u want to Walk Far, Walk Together Output: No of words starting with capital letter : 10 OR (B) Write a function that displays the line number along with no of words in it from the file Quotes.txt Example : None can destroy iron, but its own rust can! Likewise, none can destroy a person, but their own mindset can The only way to win is not be afraid of losing. Output: Line Number No of words Line 1: 9 Line 2: 11 Line 3: 11	3
30	(A) There is a stack named Uniform that contains records of uniforms Each record is represented as a list containing uid, uame, ucolour, usize, uprice. Write the following user-defined functions in python to perform the specified operations on the stack Uniform : (I) Push_Uniform(new_uniform):adds the new uniform record onto the stack (II) Pop_Uniform(): pops the topmost record from the stack and returns it. If the stack is already empty, the function should display "underflow". (III) Peep(): This function diplay the topmost element of the stack without deleting it.if the stack is empty,the function should display 'None'. OR (a) Write the definition of a user defined function push_words(N) which accept list of words as parameter and pushes words starting with A into the stack named InspireA (b) Write the function pop_words(N) to pop topmost word from the stack and return it. if the stack is empty, the function should display "Empty".	3
31	**Predict the output of the Python code given below:**	3

```
Con1="SILENCE-HOPE-SUCCEss@25"
Con2=""
i=0
while i<len(Con1):
    if Con1[i]>='0'  and Con1[i]<='9':
        Num=int(Con1[i])
        Num-=1
        Con2=Con2+str(Num)
    elif Con1[i]>='A'  and Con1[i]<='Z':
        Con2=Con2+Con1[i+1]
    else:
        Con2=Con2+'^'
    i+=1
print(Con2)
```

Q No.	Section-D (4 x 4 = 16 Marks)	Marks
32	Consider the following table named Vehicle and state the query or state the output Table:- Vehicle	4

VID	LicensePlate	VType	Owner	Cost	Contact	State
1	MH12AB1234	Car	Raj Kumar	65	9876543210	Maharastra
2	DL3CDE5678	Truck	Arjith Singh	125	8765432109	New Delhi
3	KA04FG9012	Motor cycle	Prem Sharma		9123456789	Karnataka
4	TN07GH3456	SUV	Shyad Usman	65	9987654321	Tamil Nadu
5	KA01AB1234	Car	Devid jhon	65	9876543210	Karnataka
6	TN02CD5678	Truck	Anjali Iyer	125	8765432109	Tamil Nadu
7	AP03EF9012	Motor cycle	Priya Reddy		9123456789	Andhra Pradesh

(A)

   (i) To display number of different vehicle type from the table vehicle

   (ii) To display number of records entered vehicle type wise whose minimum cost is above 80

   (iii)To set the cost as 45 for those vehicles whose cost is not mentioned

   (iv)To remove all motor cycle from vehicle

OR

(B)

   (i) SELECT VTYPE,AVG(COST) FROM VEHICLE GROUP BY VTYPE;

   (ii) SELECT OWNER ,VTYPE,CONTACT FROM VEHICLE WHERE OWNER LIKE "P%";

   (iii)SELECT COUNT(*) FROM VEHICLE WHERE COST IS NULL;

   (iv)SELECT MAX(COST) FROM VEHICLE;

| 33 | A CSV file "Movie.csv" contains data of movie details. Each record of the file contains the following data:
1.Movie id
2.Movie name
3.Genere
4.Language
5.Released date
For example, a sample record of the file may be:
["tt0050083",' '12 Angry Men is','Thriller'.'Hindi','12/04/1957']
Write the following functions to perform the specified operations on this file | 4 |

	(i) Read all the data from the file in the form of the list and display all those records for which language is in Hindi. (ii) Count the number of records in the file.	
34	Salman has been entrusted with the management of Airlines Database. He needs to access some information from Airports and Flights tables for a survey. Help him extract the following information by writing the desired SQL queries as mentioned below.	4

Table - Airports

A_ID	A_Name	City	IATACode
1	Indira Gandhi Intl	Delhi	DEL
2	Chhatrapati Shivaji Intl	Mumbai	BOM
3	Rajiv Gandhi Intl	Hyderabad	HYD
4	Kempegowda Intl	Bengaluru	BLR
5	Chennai Intl	Chennai	MAA
6	Netaji Subhas Chandra Bose Intl	Kolkata	CCU

Table - Flights

F_ID	A_ID	F_No	Departure	Arrival
1	1	6E 1234	DEL	BOM
2	2	AI 5678	BOM	DEL
3	3	SG 9101	BLR	MAA
4	4	UK 1122	DEL	CCU
5	1	AI 101	DEL	BOM
6	2	6E 204	BOM	HYD
7	1	AI 303	HYD	DEL
8	3	SG 404	BLR	MAA

i) To display airport name, city, flight id, flight number corresponding flights whose departure is from delhi

ii) Display the flight details of those flights whose arrival is BOM, MAA or CCU

iii) To delete all flights whose flight number starts with 6E.

iv) (A) To display Cartesian Product of two tables

OR

(B) To display airport name,city and corresponding flight number

35	A table named Event in VRMALL database has the following structure:	4

Field	Type
EventID	int(9)
EventName	varchar(25)
EventDate	date
Description	varchar(30)

Write the following Python function to perform the specified operations:

Input_Disp(): to input details of an event from the user and store into the table Event. The function should then display all the records organised in the year 2024.

Assume the following values for Python Database Connectivity
Host-localhost, user-root, password-tiger

Q No.	Section-E (2 x 5 = 10 Marks)	Marks
36	Ms Joshika is the Lab Attendant of the school. She is asked to maintain the project details of the project synopsis submitted by students for upcoming Board Exams. The information required are: -prj_id - integer -prj_name-string -members-integer -duration-integer (no of months)	5

	As a programmer of the school u have been asked to do this job for Joshika and define the following functions. i) Prj_input() - to input data of a project of student and append to the binary file named Projects ii) Prj_update() - to update the project details whose member are more than 3 duration as 3 months. iii) Prj_solo() - to read the data from the binary file and display the data of all project synopsis whose member is one.	
37	P&O Nedllyod Container Line Limited has its headquarters at London and regional office at Mumbai. At Mumbai office campus they planned to have four blocks for HR, Accts, Logistics and Admin related work. Each block has number of computers connected to a network for communication, data and resource sharing As a network consultant, you have to suggest best network related solutions for the issues/problems raised in (i) to (v), keeping in mind the given parameters	5

REGIONAL OFFICE MUMBAI

London Head Office

HR   ADMIN

Accts   Logistics

Distances between various blocks/locations:

Admin to HR	500m
Accts to Admin	100m
Accts to HR	300m
Logistics to Admin	200m
HR to logistics	450m
Accts to logistics	600m

Number of computers installed at various blocks are as follows:

Block	No of computers
ADMIN	95
HR	70
Accts	45
Logistics	28

i)   Suggest the most appropriate block to place the sever in Mumbai office. Justify your answer.

ii)   State the best wired medium to efficiently connect various blocks within the Mumbai Office.

iii)   Draw the ideal cable layout (block to block) for connecting these blocks for wired connectivity.

iv)   The company wants to conduct an online meeting with heads of regional office and headquarter. Which protocol will be used for the effective voice communication?

v)   Suggest the best place to house the following
     a) Repeater   b)   Switch

Time allowed: 3 Hours   Maximum Marks: 70

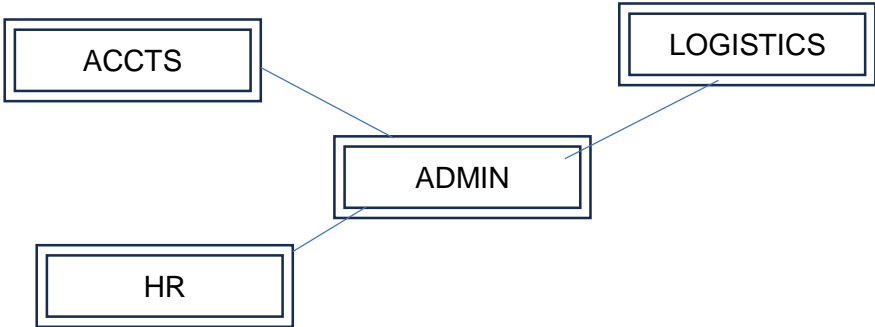| Q No.	Section-A (21 x 1 = 21 Marks)	Marks
1	False (1 mark for correct answer)	1
2	iv) [2,14,3,7] (1 mark for correct answer)	1
3	ii) 4.6 (1 mark for correct answer)	1
4	ii) ['', 'hinese ', 'ontinental'] (1 mark for correct answer)	1
5	so ie (1 mark for correct answer)	1
6	ii) 100 (1 mark for correct answer)	1
7	ii) print(farm['sheep','hen']) (1 mark for correct answer)	1
8	iii) Replace all occurrences of 'e' to 'h' (1 mark for correct answer)	1
9	iii)2 (1 mark for correct answer)	1
10	file.seek(0) (1 mark for correct answer)	1
11	iii) raise (1 mark for correct answer)	1
12	ii) 5500.0%6000$ (1 mark for correct answer)	1
13	ALTER (or ALTER TABLE) (1 mark for correct answer)	1
14	iii) Customers details whose code's second letter is A (1 mark for correct answer)	1
15	i) (20,34) (1 mark for correct answer)	1
16	c)count(col) (1 mark for correct answer)	1
17	a)IP (1 mark for correct answer)	1
18	c)Modem (1 mark for correct answer)	1
19	Packet Switching (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	A) Both A and B are true and R is the correct explanation for A (1 mark for correct answer)	1
21	D) A is False B is True	1

Q No.	Section-B (7 x 2=14 Marks)	Marks
22	Difference 1 mark Example ½ mark each	2
23	a) Assignment Operators = += -= *= **= /= //= %= b) Logical Operators not and or (any two from each) (1/2 mark for each correct operator)	2

24	(i) A) L1.pop(4)
	         Or
	        B) a=max(L2) or print(max(L2)
	
	(ii) (A) L1.append(L2)
	OR
	(B) L2.insert(1,15)
		2

25	Identify the correct output(s) of the following code. Also write the minimum and the maximum possible values of the variable Lot Minimum value possible for Lot: 4 Maximum value possible for Lot: 8 Possible outputs are : i) and ii)	2
26	Identify Primary Key and Candidate Key present if any in the below table name Colleges. Justify Primary Key: Cid its unique Candidate Key: Cid, Name, PhoneNumber as they are have unique values	2

27	(I)
	(A) UNIQUE ,NOT NULL
	OR
	(B) NOT NULL (PRIMARY KEY CAN BE GIVEN MARK)
	(II)
	   (A) ALTER TABLE flight ADD PRIMARY KEY(F_id);
	OR
	   (B) ALTER TABLE CUSTOMER DROP REMARKS;
		2

28	STAR Adv DisAdv ½ mark each BUS Adv DisAdv ½ mark each OR DNS definition 1 mark, IP purpose 1 mark	2

Q No.	Section-C (3 x 3 = 9 Marks)	Marks
29	a) Opening and closing file ½ mark Read() ½ mark split() ½ mark Loop ½ mark upper case checking ½ mark Output display ½ mark OR b) Opening and closing file ½ mark Readlines() ½ mark Loop ½ mark counting no of words ½ mark Output display ½ mark	3
30	(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) OR	3

		(1 ½ mark for correct function body; No marks for any function header as it was a part of the question)	
	31	ILENCE-^OPE-^UCCEs^^^14 correct o/p 3 mark	3

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

32	i) SELECT COUNT(DISTINCT VTYPE) FROM VEHICLE;
	ii) SELECT VTYPE,COUNT(*) FROM VEHICLE GROUP BY VTYPE HAVING MIN(COST)>80;
	iii) UPDATE VEHICLE SET COST=45 WHERE COST IS NULL
	    iv) SELECT OWNER ,VTYPE,CONTACT FROM VEHICLE WHERE OWNER LIKE "P%";
	OR
	i)
	<pre>+--------------------+----------------+
	
		VTYPE	AVG(COST)	
				+--------------------+----------------+
				
					CAR	65.0000

truck	125.0000
Moter Cycle	NULL
SUV	65.0000

MOTOR CYCLE	NULL |
	+--------------------+----------------+</pre>
	ii)
	<pre>+-------------------+--------------------+----------------+
	| OWNER
		VTYPE	CONTACT |
			+--------------------+--------------------+----------------+
			| Prem Sharma
				Moter Cycle	9987654321

PRIYA REDDY	MOTOR CYCLE	9123456789 |
		+--------------------+--------------------+----------------+</pre>
		iii)
		<pre>+---------------+
		| COUNT(*) |
		+-------------+
		| 2 |
		+-------------+</pre>
		iv)
		<pre>+----------------+
		| MAX(COST) |
		+----------------+
		| 125 |
		+----------------+</pre>
			4

33	(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) OR (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)	4
34	i) select airports.a_id,city,f_id,F_no from flights,airports where flights.f_id=airports.a_id and departure="DEL"; ii) select * from flights where arrival="bom" or arrival="Maa" or arrival="ccu";	4

	iii) delete from flights where F_no like "6E%"; iv) (A) select * from flights,airports; OR (b) select airports.a_id,city,flights.f_id from flights,airports where airports.a_id=flights.a_id;	
| 35 | ```
#interface code
import mysql.connector as mn
def Input_Disp():
    con=mc.connect(host="localhost",user="root",password="tiger",database="VRMALL")
    cur=con.cursor()
    print("Enter Event Details:")
    eid=input("ID:")
    ename=input("NAME:")
    edate=input("DATE:")
    des=input("Description:")
    query="insert into Event values("+eid+",'"+ename+"','"+edate+"','"+des+"')"
    cur.execute(query)
    con.commit()
    print("Record Inserted")

    print("Details of Event organised in year 2024")
    query="select * from Event where eventdate like '2024'"
    cur.execute(query)
    data=cur.fetchall()
    print("ID   NAME    DATE   DESCRIPTION")
    for rec in data:
        print(rec[0],rec[1],rec[2],rec[3],sep= "   ")
    con.close()
    or any other relavant code
```  <br><br> import ½ mark <br> Connectivity  stmt ½ mark <br> Cursor creation query creation ,execute(),  commit ½ mark each <br> Query creation, cursor execution ½ mark each <br> Fetching data and display loop ½ mark each | 4 |
| Q No | Section-E (2 x 5 = 10 Marks) | Mark s |
| 36 | ```
#binary file
def Prj_input():
    file=open("Projects.dat","ab")
    print("Enter Project Details:")
    pid=int(input("ID:"))
    pname=input("NAME:")
    mem=int(input("MEMBERS:"))
    dur=int(input("DURATION IN MONTHS:"))
    rec=[pid,pname,mem,dur]
    pickle.dump(rec,file)
    file.close()
    print("data inserted")
def Prj_update():
    file=open("Projects.dat","rb+")
    try:
        while True:
            pos=file.tell()
            rec=pickle.load(file)
``` | |

			5
| | ```
    if rec[2]>3:
            rec[3]=3
            file.seek(pos)
            pickle.dump(rec,file)
    except EOFError:
      pass
    finally:
      file.close()
    print("Record modified")
  def Prj_solo():
    file=open("Projects.dat","rb")
    try:
      print("PROJECT DETAILS")
      print("ID  NAME   MEMBERS  DURATION")
``` | | |
| | import pickle ½ mark
input and close ½ mark ,insert 1 mark
try except block ½ mark loop ½ mark
reading records , updation ½ mark each
try catch block ½ mark
loop ½ mark fetching and display ½ mark each | | |
| 37 | i) Server to be placed in ADMIN block as it has maximum number of computers(70 30 traffic rule)
ii) Coaxial cable/fiber optics
iii) Star topology or any other layout

ACCTS — ADMIN — LOGISTICS — HR (network layout diagram)

iv) VoIP Voice over internet Protocol
v)
a) Repeater –distance more then 90 m –all
   ..if fiber optical cable then no repeater
b) Switch- in each block as to connect computers | | 5 |