Sample Question Paper

Class: XII Session: 2023-24

Computer Science (083)

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

General Instructions:

- **Please check this question paper contains 35 questions.**
- **The paper is divided into 4 Sections- A, B, C, D and E.**
- **Section A, consists of 18 questions (1 to 18). Each question carries 1 Mark.**
- **Section B, consists of 7 questions (19 to 25). Each question carries 2 Marks.**
- **Section C, consists of 5 questions (26 to 30). Each question carries 3 Marks.**
- **Section D, consists of 3 questions (31 to 33). Each question carries 5 Marks.**
- **Section E, consists of 2 questions (34 to 35). Each question carries 4 Marks.**
- **All programming questions are to be answered using Python Language only.**

Ques. No.	Question	Marks
	SECTION A	
1	State True or False: "In a Python program, if a `break` statement is given in a nested loop, it terminates the execution of all loops in one go."	1
2	In a table in MYSQL database, an attribute `A` of datatype `varchar(20)` has the value "`Keshav`". The attribute `B` of datatype `char(20)` has value "`Meenakshi`". How many characters are occupied by attribute `A` and attribute `B`? a. 20,6 b. 6,20 c. 9,6 d. 6,9	1
3	What will be the output of the following statement: `print(3-2**2**3+99/11)` a. 244 b. 244.0 c. -244.0 d. Error	1
4	Select the correct output of the code:	1

	``` s = "Python is fun" l = s.split() s_new = "-".join([l[0].upper(), l[1], l[2].capitalize()]) print(s_new) ``` Options: a. PYTHON-IS-Fun b. PYTHON-is-Fun c. Python-is-fun d. PYTHON-Is -Fun	
5	In MYSQL database, if a table, **Alpha** has degree 5 and cardinality 3, and another table, **Beta** has degree 3 and cardinality 5, what will be the degree and cardinality of the Cartesian product of **Alpha** and **Beta**? a. 5,3 b. 8,15 c. 3,5 d. 15,8	1
6	Riya wants to transfer pictures from her mobile phone to her laptop. She uses Bluetooth Technology to connect two devices. Which type of network will be formed in this case? a. PAN b. LAN c. MAN d. WAN	1
7	Which of the following will delete key-value pair for key = "Red" from a dictionary D1? a. delete D1("Red") b. del D1["Red"] c. del.D1["Red"] d. D1.del["Red"]	1
8	Consider the statements given below and then choose the correct output from the given options: pride="#G20 Presidency" print(pride[-2:2:-2])	1

	Options a. ndsr b. ceieP0 c. ceieP d. yndsr	

9	Which of the following statement(s) would give an error during execution of the following code?
	`tup = (20,30,40,50,80,79)`
	`print(tup)  #Statement 1`
	`print(tup[3]+50)  #Statement 2`
	`print(max(tup))  #Statement 3`
	`tup[4]=80  #Statement 4`
	Options:
	a. Statement 1
	b. Statement 2
	c. Statement 3
	d. Statement 4
		1

10	What possible outputs(s) will be obtained when the following code is executed?
	`import random`
	`myNumber=random.randint(0,3)`
	`COLOR=["YELLOW","WHITE","BLACK","RED"]`
	`for I in COLOR:`
	`  for J in range(1,myNumber):`
	`  print(I,end="*")`
	`  print()`
	Options:
	a.
	RED*
	WHITE*
	BLACK*
		1

	RED* b. YELLOW* WHITE* BLACK* RED* c. WHITE* WHITE* YELLOW* YELLOW* BLACK* BLACK* RED* RED* d. YELLOW* WHITE*WHITE* BLACK* BLACK* BLACK* RED* RED* RED* RED* RED*	
11	Fill in the blank: The modem at the sender's computer end acts as a _____. a. Model b. Modulator c. Demodulator d. Convertor	1

12	Consider the code given below:
	`b=100`
	`def test(a):`
	`    _____  # missing statement`
	`    b=b+a`
	`    print(a,b)`
	`test(10)`
	`print(b)`
		1

	Which of the following statements should be given in the blank for #Missing Statement, if the output produced is 110? Options: a. `global a` b. `global b=100` c. `global b` d. `global a=100`	
13	State whether the following statement is True or False: An exception may be raised even if the program is syntactically correct.	1
14	Which of the following statements is FALSE about keys in a relational database? a. Any candidate key is eligible to become a primary key. b. A primary key uniquely identifies the tuples in a relation. c. A candidate key that is not a primary key is a foreign key. d. A foreign key is an attribute whose value is derived from the primary key of another relation.	1
15	Fill in the blank: In case of _____ switching, before a communication starts, a dedicated path is identified between the sender and the receiver.	1
16	Which of the following functions changes the position of file pointer and returns its new position? a. `flush()` b. `tell()` c. `seek()` d. `offset()`	1
	Q17 and 18 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	

17	Assertion(A): List is an immutable data type Reasoning(R): When an attempt is made to update the value of an immutable variable, the old variable is destroyed and a new variable is created by the same name in memory.	1
18	Assertion(A): Python standard library consists of number of modules. Reasoning(R): A function in a module is used to simplify the code and avoids repetition.	1
	SECTION B	
19	(i) Expand the following terms: POP3 , URL (ii) Give one difference between XML and HTML.	1+1=2

20	The code given below accepts a number as an argument and returns the reverse number. Observe the following code carefully and rewrite it after removing all syntax and logical errors. Underline all the corrections made.
	`define revNumber(num):`
	`  rev = 0`
	`  rem = 0`
	`  While num > 0:`
	`  rem ==num %10`
	`  rev = rev*10 + rem`
	`  num = num//10`
	`  return rev`
	`print(revNumber(1234))`
		2

21	Write a function `countNow(PLACES)` in Python, that takes the dictionary, `PLACES` as an argument and displays the names (in uppercase)of the places whose names are longer than 5 characters. For example, Consider the following dictionary `PLACES={1:"Delhi",2:"London",3:"Paris",4:"New York",5:"Doha"}` The output should be:	2

	LONDON NEW YORK OR Write a function, `lenWords(STRING)`, that takes a string as an argument and returns a tuple containing length of each word of a string. For example, if the string is "`Come let us have some fun`", the tuple will have `(4, 3, 2, 4, 4, 3)`	

22	Predict the output of the following code:
	`S = "LOST"`
	`L = [10,21,33,4]`
	`D={}`
	`for I in range(len(S)):`
	`  if I%2==0:`
	`  D[L.pop()] = S[I]`
	`  else:`
	`  D[L.pop()] = I+3`
	`for K,V in D.items():`
	`  print(K,V,sep="*")`
		2

23	Write the Python statement for each of the following tasks using BUILT-IN functions/methods only: (i) To insert an element `200` at the third position, in the list `L1`. (ii) To check whether a string named, `message` ends with a full stop / period or not.	1+1=2
24	Ms. Shalini has just created a table named "`Employee`" containing columns `Ename, Department` and `Salary`. After creating the table, she realized that she has forgotten to add a primary key column in the table. Help her in writing an SQL command to add a primary key column `EmpId` of integer type to the table `Employee`. Thereafter, write the command to insert the following record in the table:	2

	EmpId- 999 Ename- Shweta Department: Production Salary: 26900	

25	Predict the output of the following code:
	`def Changer(P,Q=10):`
	`  P=P/Q`
	`  Q=P%Q`
	`  return P`
	`A=200`
	`B=20`
	`A=Changer(A,B)`
	`print(A,B, sep='$')`
	`B=Changer(B)`
	`print(A,B, sep='$', end='###')`
		2

	SECTION C	

26	Predict the output of the Python code given below:
	`Text1="IND-23"`
	`Text2=""`
	`I=0`
	`while I<len(Text1):`
	`  if Text1[I]>="0" and Text1[I]<="9":`
	`  Val = int(Text1[I])`
	`  Val = Val + 1`
	`  Text2=Text2 + str(Val)`
	`  elif Text1[I]>="A" and Text1[I]<="Z":`
	`  Text2=Text2 + (Text1[I+1])`
	`  else:`
	`  Text2=Text2 + "*"`
	`  I+=1`
	`print(Text2)`
		3

27	Consider the table CLUB given below and write the output of the SQL queries that follow.	1*3=3

CID	CNAME	AGE	GENDER	SPORTS	PAY	DOAPP
5246	AMRITA	35	FEMALE	CHESS	900	2006-03-27
4687	SHYAM	37	MALE	CRICKET	1300	2004-04-15
1245	MEENA	23	FEMALE	VOLLEYBALL	1000	2007-06-18
1622	AMRIT	28	MALE	KARATE	1000	2007-09-05
1256	AMINA	36	FEMALE	CHESS	1100	2003-08-15
1720	MANJU	33	FEMALE	KARATE	1250	2004-04-10
2321	VIRAT	35	MALE	CRICKET	1050	2005-04-30

(i)
```
SELECT COUNT(DISTINCT SPORTS) FROM CLUB;
```

(ii)
```
SELECT CNAME, SPORTS FROM CLUB WHERE
DOAPP<"2006-04-30" AND CNAME LIKE "%NA";
```

(iii)
```
SELECT CNAME, AGE, PAY FROM CLUB WHERE
GENDER = "MALE" AND PAY BETWEEN 1000 AND
1200;
```

28 Write a function in Python to read a text file, `Alpha.txt` and displays those lines which begin with the word '`You`'. — 3

OR

Write a function, `vowelCount()` in Python that counts and displays the number of vowels in the text file named `Poem.txt`.

29 Consider the table `Personal` given below: — 1*3=3

`Table: Personal`

		P_ID	**Name**	**Desig**	**Salary**	**Allowance**
		P01	Rohit	Manager	89000	4800
		P02	Kashish	Clerk	NULL	1600
		P03	Mahesh	Superviser	48000	NULL
		P04	Salil	Clerk	31000	1900
		P05	Ravina	Superviser	NULL	2100
	Based on the given table, write SQL queries for the following: (i) Increase the salary by 5% of personals whose allowance is known. (ii) Display Name and Total Salary (sum of Salary and Allowance) of all personals. The column heading 'Total Salary' should also be displayed. (iii) Delete the record of Supervisors who have salary greater than 25000					
30	A list, `NList` contains following record as list elements: `[City, Country, distance from Delhi]` Each of these records are nested together to form a nested list. Write the following user defined functions in Python to perform the specified operations on the stack named `travel`. **(i)** **`Push_element(NList):`** It takes the nested list as an argument and pushes a list object containing name of the city and country, which are not in India and distance is less than 3500 km from Delhi. **(ii)** **Pop_element():** It pops the objects from the stack and displays them. Also, the function should display "Stack Empty" when there are no elements in the stack.					3

For example: If the nested list contains the following data:

```
NList=[["New York", "U.S.A.", 11734],
["Naypyidaw", "Myanmar", 3219],
["Dubai", "UAE", 2194],
["London", "England", 6693],
["Gangtok", "India", 1580],
["Columbo", "Sri Lanka", 3405]]
```

The stack should contain:

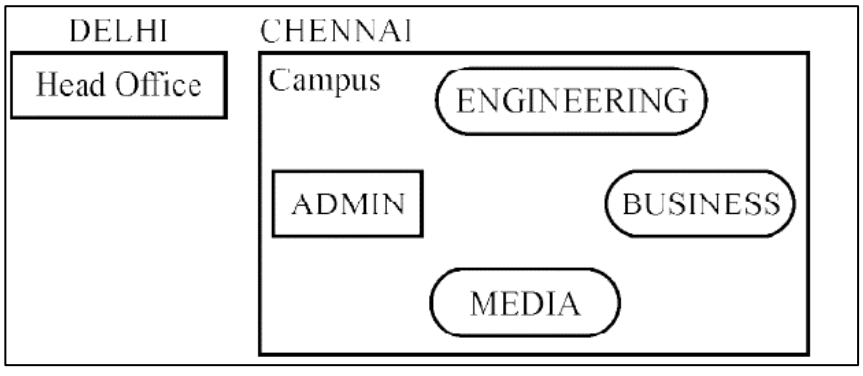
```
['Naypyidaw', 'Myanmar'],
['Dubai', 'UAE'],
['Columbo', 'Sri Lanka']
```

The output should be:

```
['Columbo', 'Sri Lanka']
['Dubai', 'UAE']
['Naypyidaw', 'Myanmar']
Stack Empty
```

SECTION D

31 Meticulous EduServe is an educational organization. It is planning to setup its India campus at Chennai with its head office at Delhi. The Chennai campus has 4 main buildings – ADMIN, ENGINEERING, BUSINESS and MEDIA 1*5=5



Block to Block distances (in Mtrs.)

From	To	Distance
ADMIN	ENGINEERING	55 m

ADMIN	BUSINESS	90 m	
ADMIN	MEDIA	50 m	
ENGINEERING	BUSINESS	55 m	
ENGINEERING	MEDIA	50 m	
BUSINESS	MEDIA	45 m	
DELHI HEAD OFFICE	CHENNAI CAMPUS	2175 km	

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

ADMIN	110
ENGINEERING	75
BUSINESS	40
MEDIA	12
DELHI HEAD	20

a) Suggest and draw the cable layout to efficiently connect various blocks of buildings within the CHENNAI campus for connecting the digital devices.

b) Which network device will be used to connect computers in each block to form a local area network?

c) Which block, in Chennai Campus should be made the server? Justify your answer.

d) Which fast and very effective wireless transmission medium should preferably be used to connect the head office at DELHI with the campus in CHENNAI?

e) Suggest a device/software to be installed in the CHENNAI Campus to take care of data security.

32	(i) Differentiate between r+ and w+ file modes in Python. (ii) Consider a file, `SPORT.DAT`, containing records of the following structure:	2+3=5

	[SportName, TeamName, No_Players] Write a function, copyData(), that reads contents from the file SPORT.DAT and copies the records with Sport name as "**Basket Ball**" to the file named BASKET.DAT. The function should return the total number of records copied to the file BASKET.DAT. **OR** **(Option for part (ii) only)** A Binary file, CINEMA.DAT has the following structure: {MNO:[MNAME, MTYPE]} Where MNO – Movie Number MNAME – Movie Name MTYPE is Movie Type Write a user defined function, findType(mtype), that accepts mtype as parameter and displays all the records from the binary file CINEMA.DAT, that have the value of Movie Type as mtype.	
33	(i) Define the term Domain with respect to RDBMS. Give one example to support your answer. (ii) Kabir wants to write a program in Python to insert the following record in the table named Student in MYSQL database, SCHOOL: • rno(Roll number)- integer • name(Name) - string • DOB (Date of birth) – Date • Fee – float Note the following to establish connectivity between Python and MySQL: • Username - root • Password - tiger	1+4=5

- Host - `localhost`

The values of fields `rno, name, DOB` and `fee` has to be accepted from the user. Help Kabir to write the program in Python.

SECTION E

34 Consider the tables PRODUCT and BRAND given below: 1*4=4

Table: PRODUCT

PCode	PName	UPrice	Rating	BID
P01	Shampoo	120	6	M03
P02	Toothpaste	54	8	M02
P03	Soap	25	7	M03
P04	Toothpaste	65	4	M04
P05	Soap	38	5	M05
P06	Shampoo	245	6	M05

Table: BRAND

BID	BName
M02	Dant Kanti
M03	Medimix
M04	Pepsodent
M05	Dove

Write SQL queries for the following:

(i) Display product name and brand name from the tables PRODUCT and BRAND.

(ii) Display the structure of the table PRODUCT.

(iii) Display the average rating of Medimix and Dove brands

(iv) Display the name, price, and rating of products in descending order of rating.

35	Vedansh is a Python programmer working in a school. For the Annual Sports Event, he has created a csv file named `Result.csv`, to store the results of students in different sports events. The structure of `Result.csv` is : `[St_Id, St_Name, Game_Name, Result]` Where `St_Id` is Student ID (integer) `ST_name` is Student Name (string) `Game_Name` is name of game in which student is participating(string) Result is result of the game whose value can be either `'Won', 'Lost'` or `'Tie'` For efficiently maintaining data of the event, Vedansh wants to write the following user defined functions: `Accept()` – to accept a record from the user and add it to the file `Result.csv`. The column headings should also be added on top of the csv file. `wonCount()` – to count the number of students who have won any event. As a Python expert, help him complete the task.	4

Marking Scheme

Class XII

Computer Science (083)

Time Allowed: 3 hours **MM: 70**

Ques No	Question and Answers	Distribution of Marks	Total Marks
	SECTION A		
1	False	1 mark for correct answer	1
2	Option b 6,20	1 mark for correct answer	1
3	Option c -244.0	1 mark for correct answer	1
4	PYTHON-is-Fun	1 mark for correct answer	1
5	Option b 8,15	1 mark for correct answer	1
6	Option a PAN	1 mark for correct answer	1
7	Option b `del D1["Red"]`	1 mark for correct answer	1
8	Option b	1 mark for correct answer	1

	ceieP0		
9	Option d Statement 4	1 mark for correct answer	1
10	Option b YELLOW* WHITE* BLACK* RED*	1 mark for correct answer	1
11	Option b Modulator	1 mark for correct answer	1
12	Option c global b	1 mark for correct answer	1
13	True	1 mark for correct answer	1
14	Option c A candidate key that is not a primary key is a foreign key.	1 mark for correct answer	1
15	circuit	1 mark for correct answer	1
16	Option c `seek()`	1 mark for correct answer	1

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17	Option d A is false but R is True	1 mark for correct answer	1
18	Option b Both A and R are true but R is not the correct explanation for A	1 mark for correct answer	1
	SECTION B		
19	(i) POP3 – Post Office Protocol 3 URL – Uniform Resource Locator (ii) HTML(Hyper text mark Up language) • We use pre-defined tags • Static web development language – only focuses on how data looks • It use for only displaying data, cannot transport data • Not case sensistive XML (Extensible Markup Language) • we can define our own tags and use them • Dynamic web development language – as it is used for transporting and storing data • Case sensitive	½ mark for each correct expansion 1 mark for any one correct difference No mark to be awarded if only full form is given	1+1=2

20	`def revNumber(num):`
	`  rev = 0`
	`  rem = 0`
	`  while num > 0:`
		½ mark for each	2

	rem =num %10 rev = rev*10 + rem num = num//10 return rev print(revNumber(1234))	correction made	

21	PLACES={1:"Delhi",2:"London",3:"Paris",4:"New York",5:"Dubai"}
	def countNow(PLACES):
	for place in PLACES.values():
	if len(place)>5:
	print(place.upper())
	countNow(PLACES)
	
	OR
	
	def lenWords(STRING):
	T=()
	L=STRING.split()
	for word in L:
	length=len(word)
	T=T+(length,)
	return T
	Note: Any other correct logic may be marked
		½ mark for correct function header
		½ mark for correct loop
		½ mark for correct if statement
		½ mark for displaying the output
		½ mark for correct function header
		½ mark for using split()
		½ mark for adding to tuple
		½ mark for return statement
			2

[4]

22	4*L 33*4 21*S 10*6	½ mark for each correct line of output	2
23	(i) L1.insert(2,200) (ii) message.endswith('.')	1 mark for each correct statement	1+1=2

24	SQL Command to add primary key:
	`ALTER TABLE Employee ADD EmpId INTEGER PRIMARY KEY;`
	As the primary key is added as the last field, the command for inserting data will be:
	`INSERT INTO Employee VALUES("Shweta","Production",26900,999);`
	OR
	`INSERT INTO Employee(EmpId,Ename,Department,Salary) VALUES(999,"Shweta","Production",26900);`
		1 mark for correct ALTER TABLE command
		1 mark for correct INSERT command
			2

25	10.0$20 10.0$2.0###	1 mark for each correct line of output	2
SECTION C			
26	ND-*34	½ mark for each correct character	3
27			

	(i) **COUNT(DISTINCT SPORTS)** 4 (ii) **CNAME** | **SPORTS** AMINA | CHESS (iii) **CNAME** | **AGE** | **PAY** AMRIT | 28 | 1000 VIRAT | 35 | 1050	1 mark for each correct output	1*3=3

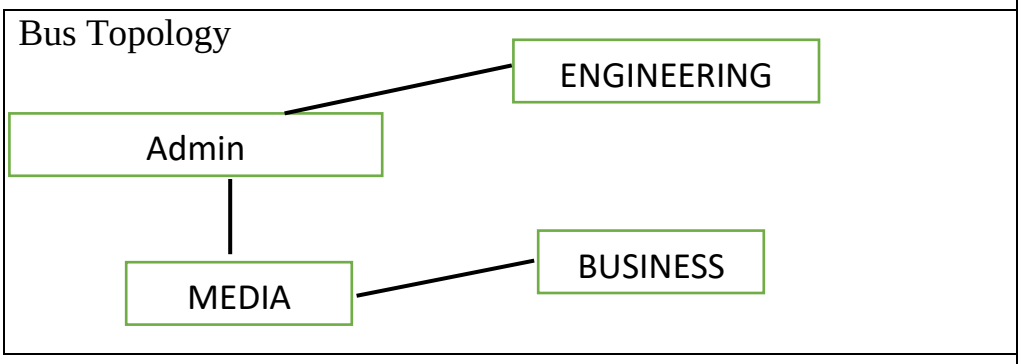
28	`def test():`
	`  fObj1 = open("Alpha.txt","r")`
	`  data = fObj1.readlines()`
	`  for line in data:`
	`  L=line.split()`
	`  if L[0]=="You":`
	`  print(line)`
	`  fObj1.close()`
	
	OR
		1 mark for correctly opening and closing files
		
		½ mark for correctly reading data
		
		1 mark for correct loop and if statement
		
		½ mark for displaying data
			3

[6]

	``
	def vowelCount():
	    fObj = open("Alpha.txt","r")
	    data = str(fObj.read())
	    cnt=0
	    for ch in data:
	        if ch in "aeiouAEIOU":
	            cnt=cnt+1
	    print(cnt)
	    fObj.close()
	``
	
	Note: Any other correct logic may be marked
		1 mark for correctly opening and closing the files
		
		½ mark for correctly reading data
		
		1 mark for correct loop and if statement
		
		½ mark for displaying the output.	

29	(i) ``` UPDATE Personal SET Salary=Salary*0.5 WHERE Allowance IS NOT NULL; ``` (ii) ``` SELECT Name, Salary+Allowance AS "Total Salary" FROM Personal; ``` (iii) ``` DELETE FROM Personal WHERE Salary>25000 ```	1 mark for each correct query	1*3=3

30	
	travel = []
	def Push_element(NList):
	  for L in NList:
	  if L[1] != "India" and L[2]<3500:
	  travel.append([L[0],L[1]])
	
	def Pop_element():
	  while len(travel):
	  print(travel.pop())
	  else:
	  print("Stack Empty")
		1 ½ marks for each function	3

	SECTION D		
31	a)  b) Switch c) Admin block, as it has maximum number of computers. d) Microwave e) Firewall	1 mark for each correct answer	1*5=5
32	(i) r+ mode: • Primary function is reading • File pointer is at beginning of file • if the file does not exist, it results in an error w+ mode:	1 mark for each correct difference (minimum two differences should be given)	2+3=5

[8]

- primary function is writing
- if the file does not exist, it creates a new file.
- If the file exists, previous data is overwritten
- File pointer is at the beginning of file

(ii)

```
def copyData():
    fObj = open("SPORT.DAT", "rb")
    fObj1 = open("BASKET.DAT","wb")
    cnt=0
    try:
        while True:
            data = pickle.load(fObj)
            print(data)
            if data[0] == "Basket Ball":
                pickle.dump(data,fObj1)
                cnt+=1
    except:
        fObj.close()
        fObj1.close()
    return cnt
```

½ mark for correctly opening and closing files

½ mark for correct try and except block

½ mark for correct loop

1 mark for correctly copying data

½ mark for correct return statement

OR

(Only for option ii)

```
def Searchtype(mtype):
    fObj = open("CINEMA.DAT", "rb")
    try:
        while True:
            data = pickle.load(fObj)
            if data[2] == mtype:
                print("Movie number:",data[0])
                print("Movie Name:",data[1])
                print("Movie Type:",data[2])
    except EOFError:
        fObj.close()
```

½ mark for correctly opening and closing files

½ mark for correct try and except block

½ mark for correct loop

	Note: Any other correct logic may be marked	½ mark for correct if statement 1 mark for correctly displaying data	
33	(i) Domain is a set of values from which an attribute can take value in each row. For example, roll no field can have only integer values and so its domain is a set of integer values	½ mark for correct definition ½ mark for correct example	1+4=5

	(ii)
	`import mysql.connector as mysql`
	`con1 = mysql.connect(host="localhost",user="root", password="tiger", database="sample2023")`
	`mycursor=con1.cursor()`
	`rno = int(input("Enter Roll Number:: "))`
	`name = input("Enter the name:: ")`
	`DOB = input("Enter date of birth:: ")`
	`fee= float(input("Enter Fee:: "))`
	`query = "INSERT into student values({},'{}','{}',{})".format(rno,name,DOB,fee)`
	`mycursor.execute(query)`
	`con1.commit()`
	`print("Data added successfully")`
	`con1.close()`
	
	Note: Any other correct logic may be marked
		½ mark for importing correct module
		
		1 mark for correct connect()
		
		½ mark for correctly accepting the input
		
		1 ½ mark for correctly executing the query
		
		½ mark for correctly using commit()	

[10]

SECTION E

34

(i)

```
SELECT PName, BName FROM PRODUCT P,
BRAND B WHERE P.BID=B.BID;
```

(ii)

```
DESC PRODUCT;
```

(iii)

```
SELECT BName, AVG(Rating) FROM PRODUCT
P, BRAND B
WHERE P.BID=B.BID
GROUP BY BName
HAVING BName='Medimix' OR
BName='Dove';
```

(iv)

```
SELECT PName, UPrice, Rating
FROM PRODUCT
ORDER BY Rating DESC;
```

1 mark for each correct query

1*4=4

35

```
def Accept():
    sid=int(input("Enter Student ID "))
    sname=input("Enter Student Name ")
    game= input("Enter name of game ")
    res=input("Enter Result")
    headings=["Student ID","Student Name"," Game Name", "Result"]
    data=[sid,sname,game,res]
    f=open('Result.csv','a',newline='')
    csvwriter=csv.writer(f)
    csvwriter.writerow(headings)
    csvwriter.writerow(data)
    f.close()
```

½ mark for accepting data correctly

½ mark for opening and closing file

½ mark for writing headings

½ mark for writing row

4

	``
	def wonCount():
	    f=open('Result.csv','r')
	    csvreader=csv.reader(f, delimiter=',')
	    head=list(csvreader)
	    print(head[0])
	    for x in head:
	        if x[3]=="WON":
	            print(x)
	    f.close()
	``
		½ mark for opening and closing file
		
		½ mark for reader object
		
		½ mark for print heading
		
		½ mark for printing data	

[12]