CLASS XII COMPUTER SCIENCE (083)
MODEL TEST PAPER – 2 (THEORY) (2020-21)
(UNSOLVED)

Maximum Marks: 70   **Time Allowed: 3 hrs**

General Instructions:

1. This question paper contains two parts, A and B. Each part is compulsory.

2. Both Part A and Part B have choices.

3. Part A has 2 sections:
   (a) Section I is short answer questions, to be answered in one word or one line.
   (b) Section II has two case study questions. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of the 5 sub-parts.

4. Part B is Descriptive Paper. Part B has three sections:
   (a) Section I is short answer questions of 2 marks each in which two questions have internal options.
   (b) Section II is long answer questions of 3 marks each in which two questions have internal options.
   (c) Section III is very long answer questions of 5 marks each in which one question has internal options.

5. All programming questions are to be answered using Python language only.

PART A – Section I

Select the most appropriate option out of the options given for each question. Attempt any 15 questions from question no. 1 to 21.

1. Give one example each of mutable and immutable data type in Python. (1)

2. Suppose `L1=["xyz",[1,2,3],80,"RollNo"]` (1)
   Consider the list L1 and write the output of: `L1[1][2]`

3. The `readlines()` method returns: (1)
   (i) String   (ii) A list of integers
   (iii) A list of single characters   (iv) A list of lines

4. The statement `a= str1>str2` shall return _____ as the output if two strings str1 and str2 contain "Delhi" and "New Delhi". (1)

5. Consider a tuple `T1=(1,2,3,4)`. (1)
   Select the option that will add a new element in tuple T1.
   (i) `T1[4]=5`   (ii) `T1=(5)`
   (iii) `T1=T1+5`   (iv) `T1=T1+(5,)`

6. Write the output of the following statements: (1)
   ```
   D1={1:10,2:20,3:30,4:40,5:50}
   print(len(D1))
   D1[2]=60
   print(D1)
   ```

7. A tuple T is declared with the following values: (1)
   ```
   T=('a','b','I','II', [1,2,3],["Name","Class","Subject","Section"],10,20)
   ```
   What will be the output of
   ```
   T=T[-6:-3]+T[-4:-2]
   ```

8. Name the function that checks alphabets in a given string. (1)

9. Name the protocol that allows you to login to a remote computer. (1)

10. The term _____ refers to a person who purposely posts opposing, sarcastic, demeaning or insulting comments about someone or something. (1)

11. What is cardinality and degree of a table in SQL? (1)

12. Choose the correct SQL command to retrieve the records of those employees whose commission is NULL in EMP table. (1)
    (i) `Select * from EMP where commission =NULL;`
    (ii) `Select * from EMP where commission =0;`
    (iii) `Select * from EMP where commission IS NULL;`
    (iv) `Select commission IS NULL from EMP;`

13. Name SQL function used to find the average. (1)

14. Name two special wild card characters that are used in pattern matching in SQL. (1)

15. Two LANs are connected with Ethernet cable and the distance between them is 160 metres. The loss of signal error occurs during transmission of data between them. Which device will you suggest for smooth transmission of data between two LANs? (1)

16. Consider a list, `List1=[100,200,300,100,400,500,100,200]`.
    Write the output of the following statements: (1)
    (i) `List1.pop(-2)`   (ii) `List1.count(100)`

17. What is the correct Python code to display the last four characters of string 'Str' containing the text "Swachh Bharat Abhiyaan"? (1)
    (i) `Str[4:]`   (ii) `Str[-4:]`
    (iii) `Str[*4:]`   (iv) `Str[/4:]`

18. Write SQL command to open an existing database. (1)

19. Identify the domain name and URL from the given address: (1)
    http://www.educationhub.com/courses/datscience.html

20. Which SQL command is used to add a new column in an already existing table? (1)

21. Which of the following is not a transmission medium? (1)
    (i) Ethernet cable   (ii) Coaxial cable
    (iii) Modem   (iv) Satellite

Section II

Both the case study-based questions are compulsory. Attempt any 4 sub-parts from each question. Each sub-part carries 1 mark.

22. Simran Pandit, a Chemistry teacher, wants to maintain a record of all the equipment present in the Chemistry lab of VPS School, New Delhi. She takes the help of IT Head of the school to create "ChemLab" table in "SCHOOLLAB" database. Consider the table "ChemLab" and answer the following questions:

EQNo	EQName	Qty	DateofPurchase
E1	Safety goggles	60	2019-12-20
E2	Beakers	120	2020-01-09
E3	Florence flasks	100	2019-05-12
E4	Funnels	80	2019-10-10
E5	Volumetric flasks	90	2019-08-12
E6	Graduated cylinders	40	2020-02-17

    (i) Identify the Primary Key of the table ChemLab. (1)
    (ii) Count the total number of equipment available in lab. (1)
    (iii) Add one more column : "Last_used_on" with Date datatype. (1)
    (iv) Add 20 more graduated cylinders in the table. (1)
    (v) Insert the following data in the table: (1)
        (EQNo = E7, EQName=Thermometers, Qty=25, DateofPurchase= 2020-03-10)

23. Observe the following code and answer the questions that follow:

```
import csv                                                # Line 1
def MakeCSV():
    file=_____('Student.csv',"w")                     #Line 2
    f1=csv._____(file)                                  #Line 3
    while True:
        Name=input("Name:")
        Marks=_____ (input("Enter Marks:"))             # Line 4
        Row=[Name,Marks]
        f1._____(Row)                              # Line 5
    file.close()
```

(a) Write the full form of `csv` given in Line 1. (1)

(b) Fill in the blank with a function that will open the file to write. (1)

(c) Fill in the blank in Line 3 to write the data to csv file. (1)

(d) Fill in the blank in Line 4 to convert String into float data type. (1)

(e) Fill in the blank in Line 5 to write a line in csv file. (1)

PART B – Section I

24. Convert the following for loop into its equivalent while loop: (2)

```
for i in range(10,50,5):
    print(i)
```

25. Differentiate between Cookies and Firewall. (2)

OR

Differentiate between Switch and Hub.

26. Expand the following terms: (2)

(i) CDMA   (ii) Wi-Max

(iii) Mbps   (iv) GPRS

27. From the program given below, identify the parts mentioned below: (2)

```
def Square(x):
    a=10;
    return a*a
b=5
res=Square(b)
```

(i) Formal argument

(ii) Actual argument

(iii) Function header

(iv) Function call

OR

Explain with the help of an example how you can access global variable and change its value from another function.

28. Find errors in the following code and rewrite the correct code by underlining the corrections: (2)

```
num=5
for i in [0,10]:
  if num=i:
    print(num*2)
  else
    print (num *3)
```

29. Observe the following program and find out which output(s) out of (a) to (d) will not be expected from the program. What will be the minimum and maximum value assigned to the variables X and Y?   (2)

```
import random
X= random.random()
Y= random.randint(0,4)
print (int (X),":", Y+ int(X))
```

  (i) 0 : 0   (ii) 1 : 6

(iii) 2 : 4   (iv) 0 : 3

30. Define the terms data inconsistency and data redundancy in the context of RDBMS.   (2)

31. Differentiate between relative and absolute path of files. Explain with a suitable example.   (2)

32. What are constraints in SQL? Explain any two constraints.   (2)

33. Write the output of the following code: (2)

```
Text="@Shop2HomeDelivery"
L=len(Text)
n=""
for i in range(0,L):
  if Text[i].isupper():
    n=n+Text[i].lower()
  elif Text[i].isalpha():
    n=n+Text[i].upper()
  else:
    n=n+'##'
print(n)
```

Section II

34. Write a function AddZero(Scores) to add all those values in the list of Scores which are ending with zero, and display the sum.

For example,

If the Scores contain[200,456,300,500,233,453]

The sum of scores should be displayed as 1000.   (3)

35. Write a user-defined function CheckInT() in Python that reads lines of the "VirtualReality.txt" and displays those lines which are starting with either 'I' or 'T'. *For example*, if the content of the file is:

Artificial Intelligence refers to the simulation of human intelligence that is programmed to think like humans and mimic their actions.

In 1955, John McCarthy coined the term Artificial Intelligence.

The overall research goal of AI is to create technology that allows computer and machines to function in an intelligent manner.

The function should display:

In 1955, John McCarthy coined the term Artificial Intelligence.

The overall research goal of AI is to create technology that allows computer and machines to function in an intelligent manner.   (3)

                OR

Write a function in Python to read lines from a text file "MyDiary.txt" and count the number of vowels (both in small and capital letters) and display all of them.

36. Consider the given tables 'Bus' and 'Charges' and write the output of the following SQL commands: (3)

Table: Bus

RNo	Area	Capacity	NoOfStudents
R1	Pitam Pura	100	92
R2	Rohini Sec-5	80	80
R3	Rohini Sec-11	60	58
R4	Rohini Sec-18	40	42
R5	Rohini Sec-24	120	122

Table: Charges

BusNo	RNo	Transporter	Charges
B1	R2	Shivam Travels	3200
B2	R5	Bagga Travels	3500
B3	R4	Bagga Travels	200
B4	R3	Shivam Travels	1500
B5	R1	Bagga Travels	1800

(a) `Select RNo, SUM(NoOfStudents), SUM(Charges) from Bus,`
   `Charges where Bus.Rno=Charges.RNo and Bus.Area="Rohini%";`

(b) `Select Area, MIN(Capacity) , MAX(NoOfStudents) from Bus;`

(c) `Select RNo, Area,AVG(Charges) from Bus, Charges where`
   `Bus.Rno=Charges.RNo andTransporter = "Bagga Travels" and NoOfStudents <60;`

37. Write a function `Sort(L1)` in Python where L1 is a list of numbers and sort a stack in ascending order (with biggest items on top). (3)

<div align="center">OR</div>

Write `AddCustomer()` and `DeleteCustomer(Customer)` methods in Python to add a new Customer and delete a Customer from a list of CustomerNames, considering them to act as push and pop operations of the stack data structures.

<div align="center">Section III</div>

38. Learning Data Analytics Pvt. Ltd. is an institute that provides courses on Data Science, Machine Learning, AI and Data Analytics in Delhi-NCR. The institute is planning to start their regional institutes in three major cities in India—"Bengaluru", "Ahmedabad" and "Shimla"—to provide accessibility of these courses in different cities. The institute has their head office in Ghaziabad with three different branches—"Admin Office", "Accounts Office" and "IT Office". A rough layout of the same is as follows: (5)
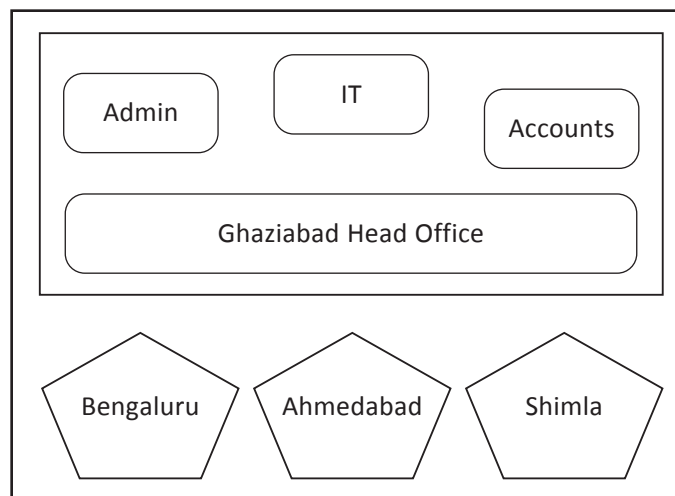
Approximate distance between these offices is as follows:

Head Office – Admin Office	10Km
Head Office – IT Office	50Km
Head Office – Accounts Office	25Km
Head Office – Bengaluru Inst.	2138Km
Head Office – Ahmedabad Inst.	1115Km
Head Office – Shimla Inst.	365Km

The IT Department has planned to install the following number of computers in each of their institutes:

Head Office	350
IT Office	200
Accounts Office	100
Bengaluru Inst.	250
Ahmedabad Inst.	80
Shimla Inst.	75

(i) Suggest network type (out of LAN, MAN, WAN) for connecting each of the following sets of their offices:

    (a) Head Office and IT Office   (b) Head Office and Bengaluru Office

(ii) Which device will you suggest to be procured by the Head Office to connect all the computers with each of their institutes out of the following devices?

    (a) Modem   (b) Telephone

    (c) Switch/Hub

(iii) Which medium will be used for providing Online Classes to the students during COVID-19 pandemic?

(iv) Suggest a cable layout for connecting the company's local offices located in New Delhi.

(v) Suggest an effective and fast method/technology for connecting the Head Office in Ghaziabad to its institute located in Shimla.

39. Write SQL commands for the following queries (i) to (v) based on the tables "Staff" and "Salary".   (5)

Table: Staff

STID	Name	Dept	Gender	Experience
S101	Vikas	Sales	M	12
F109	Nikhil	Finance	M	5
R229	Priya	Research	F	13
S189	Kiran	Sales	F	5
F514	Karuna	Finance	F	6
S321	Reema	Sales	M	2
F888	Umesh	Finance	M	4
R777	Rajni	Research	F	15

Table: Salary

EmpID	STID	BasicSalary	HRA
1	F109	18000	4000
2	S321	21000	3500
3	F888	25000	4200
4	R777	40000	7000
5	R229	45000	9200

(i) Display names of all staff members who are in "Research" department having more than 13 years of experience and whose Basic Salary is greater than 40000.

(ii) Display the minimum HRA given to female staff.

(iii) Display maximum and minimum total salary (BasicSalary + HRA) of all staff of different departments.

(iv) Display name and department of staff in descending order of total salary (BasicSalary + HRA).

(v) Display details of all the Male staff whose department is "Sales".

40. A binary file "Bank.dat" has the following structure: (`AccNo, CustName, BankName, Amount, DateofOpen, Interest`). Write functions in Python to: (5)

(i) Create and display the data from the "Bank.dat" file.

(ii) Display details of all the customers whose amount is greater than 50000.

<div align="center">OR</div>

Create a binary file "Directory.dat" that has the structure: (`SNo, FName, LName, ContactNo, Address`). Write a function `FindPer()` in Python that would read contents from the file and display details of the total persons who live in 'Paschim Vihar' and 'Pitam Pura'.