Sample Question Paper – 2

COMPUTER SCIENCE (Code: 083)

Maximum Marks: 35 **Time: 2 hours**

General Instructions

- The question paper is divided into 3 sections – A, B and C
- Section A, consists of 7 questions (1-7). Each question carries 2 marks.
- Section B, consists of 3 questions (8-10). Each question carries 3 marks.
- Section C, consists of 3 questions (11-13). Each question carries 4 marks.
- Internal choices have been given for question numbers 7, 8 and 12.

		Section -A **Each question carries 2 marks**	
1.		What is a stack? In Python, should we implement stacks using a list or a tuple? Justify your answer.	(2)
2.	**(i)**	Expand the following: **VoIP, SMTP**	(1)
	(ii)	Out of the following, which is more secure way of data transmission, and why? **Radio waves, Micro waves**	(1)
3.		When is char data type preferred over varchar as the datatype for a column of a table? What is the advantage of that?	(2)
4.		Suppose a cursor object, named **crsr**, has been already created in a script. Write Python statements to retrieve all the records from a table "Student" using this cursor object, and display the first record.	(2)
5.		Write the output of the queries (a) to (d), based on the table "la" given below: +-------+-------------+-------------+----------+------------+----------+ | accno | C_name | instalments | int_rate | start_date | loan_amt | +-------+-------------+-------------+----------+------------+----------+ | 1 | R.K.Gupta | 36 | 12.00 | 2009-07-19 | 300000 | | 2 | S.P. Sharma | 48 | 10.00 | 2008-03-22 | 500000 | | 3 | K.P. Jain | 36 | NULL | 2007-03-08 | 300000 | | 4 | M.P. Yadav | 60 | 10.00 | 2008-06-12 | 800000 | | 5 | S.P. Sinha | 36 | 12.50 | 2010-03-01 | 200000 | | 6 | P. Sharma | 60 | 12.50 | 2008-05-06 | 700000 | | 7 | K.S. Dhall | 48 | NULL | 2008-05-03 | 500000 | +-------+-------------+-------------+----------+------------+----------+ (a) `select instalments, avg(loan_amt) from la group by instalments;` (b) `select accno, instalments from la order by instalments desc;` (c) `select C_name, start_date from la where int_rate is null;` (d) `select avg(int_rate), min(int_rate), max(int_rate) from la;`	(2)
6.	(i)	Which command is used to delete a table.	(1)
	(ii)	If two tables of a database have no common field, what will be their natural join?	(1)

7. (i) Give a suitable example of a table with sample data and illustrate Primary and Candidate keys in it. (2)

(ii) What is the difference between degree and cardinality of a table? What is the degree and cardinality of the following table:

ENo	Name	Salary
101	John Fedrick	45000
103	Raya Mazumdar	50600

OR

(i) Give a suitable example of a table with sample data and illustrate Primary and Alternate keys in it.

(ii) Observe the following table carefully and write the names of the most appropriate columns, which can be considered as (i) candidate keys and (ii) primary key.

Id	Product	Qty	Price	Transaction Date
101	Plastic Folder 12"	100	3400	2014-12-14
104	Pen Stand Standard	200	4500	2015-01-31
105	Stapler Medium	250	1200	2015-02-28
109	Punching Machine Big	200	1400	2015-03-12
103	Stapler Mini	100	1500	2015-02-02

SECTION – B

Each question carries 3 marks

8. Ismail has created the following list: (3)

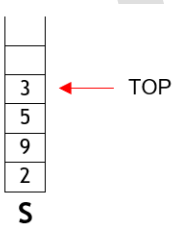
```
From random import randint
nums=[randint(10,99) for I in range(20)]
```

Write a program, with separate user defined functions to perform the following operations:

- Push the even numbers from the list into a stack, and then push all the odd numbers from the list into the same stack.
- Pop and display the content of the stack.

OR

Consider a stack S as follows:



S

Assuming standard definitions of functions PUSH() and POP(), redraw the stack after performing each of the following set of operations:

```
POP(S); POP(S); PUSH(S,8); PUSH(S,3); POP(S); PUSH(S,9)
```

9. (i) A table BOTTLES has been created in a database with the following fields: (1)

B_ID, Shape, Volume, Color, Price

Write an SQL command to add a new column named Material of type varchar(10).

(ii) What category (DDL or DML) of command will be used to perform the following operations: (2)

(i) Change the values in a column of a table
(ii) Add data into the table
(iii) Add a new column to the table
(iv) Add a constraint to a column of the table.

10. Naveen has to create a database named **INVENTORY** in MySQL, and a table **ITEM** in it.
The table **ITEM** has the following structure:

Field	Data Type	Remarks
Code	Char(5)	Primary Key
Name	Varchar(20)	Unique
Supplier	Varchar(10)	
Last_Price	Float	
Bal_Qty	Float	

To help Naveen with this task, write the required SQL commands to create the database and the table in it.

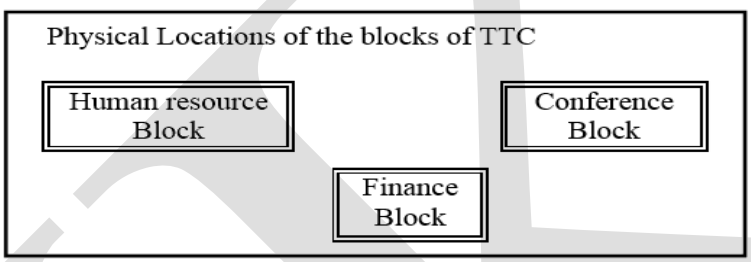
Section C
Each question carries 4 marks

11. Write queries (a) to (d) based on the tables DOCTOR and PATIENT whose structures are given below: (4)

Table: DOCTOR		
Field	**Data Type**	**Remarks**
D_ID	Char(5)	Primary Key
Name	Varchar(20)	Not Null
DEPT	Varchar(10)	
Fee	integer	
Days	Int(7)	

Table: PATIENT		
Field	**Data Type**	**Remarks**
P_ID	Integer	Primary Key
Name	Varchar(20)	Not Null
DOB	Date	
DOV	Date	Date of last visit
Phone	Varchar(14)	
D_ID	Char(5)	

(a) Display the number of doctors in each department (DEPT).
(b) Display the number of patients visiting each doctor along with the doctor name.
(c) Display the number of patients whose last visit was in the month of January 2022.
(d) Display the information of all the doctors in the ascending order of their department, and within each department in the alphabetical order of doctor names.

<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>12.</td><td>(i)</td><td>Give two advantages and two disadvantages of twisted pair cables.
OR
Define the terms: URL, Web Browser</td><td>(2)</td></tr>
<tr><td></td><td>(ii)</td><td>Write any two differences between HTML and XML.</td><td>(2)</td></tr>
<tr><td>13.</td><td></td><td>(i) Trine Tech Corporation (TTC) is a professional consultancy company. The company is planning to set up their new offices in India with its hub at Hyderabad. As a network adviser, you have to understand their requirement and suggest them the best available solutions. Their queries are mentioned (a) to (d) below.
 

Block to Block distances (in Mtrs.)
<table>
<tr><th>FROM</th><th>To</th><th>Distance</th></tr>
<tr><td>Human resource</td><td>Conference</td><td>110</td></tr>
<tr><td>Human resource</td><td>Finance</td><td>40</td></tr>
<tr><td>Conference</td><td>Finance</td><td>80</td></tr>
</table>
Number of computers in each of the blocks/Center is as follows:
<table>
<tr><td>Human resource</td><td>25</td></tr>
<tr><td>Finance</td><td>120</td></tr>
<tr><td>Conference</td><td>90</td></tr>
</table>
a) What will be the most appropriate block, where TTC should plan to install the server?
b) Draw a block to block cable layout to connect all the buildings in the most appropriate manner for efficient communication.
c) What will be the best possible connectivity out of the following, you will suggest to connect the new setup of offices in Bangalore with its London based office?
Satellite Link, Infrared, Ethernet cable
d) Which of the following devices will be suggested by you to connect each computer in each of the buildings?
Switch, modem, Gateway</td><td>(4)</td></tr>
</table>