Sample Question Paper

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**	
Q. No	**Part No.**	**Question**	**Marks**
1.		Give any two characteristics of stacks.	(2)
2.	(i)	Expand the following: **SMTP , XML**	(1)
	(ii)	Out of the following, which is the fastest wired and wireless medium of transmission? **Infrared, coaxial cable, optical fibre, microwave, Ethernet cable**	(1)
3.		Differentiate between char(n) and varchar(n) data types with respect to databases.	(2)
4.		A resultset is extracted from the database using the cursor object (that has been already created) by giving the following statement. **Mydata=cursor.fetchone()** (a) How many records will be returned by fetchone() method? (b) What will be the datatype of Mydata object after the given command is executed?	(2)

5. Write the output of the queries (a) to (d) based on the table, Furniture given below: (2)

Table: FURNITURE

FID	NAME	DATEOFPURCHASE	COST	DISCOUNT
B001	Double Bed	03-Jan-2018	45000	10
T010	Dining Table	10-Mar-2020	51000	5
B004	Single Bed	19-Jul-2021	22000	0
C003	Long Back Chair	30-Dec-2016	12000	3
T006	Console Table	17-Nov-2019	15000	12
B006	Bunk Bed	01-Jan-2021	28000	14

```
(a)  SELECT SUM(DISCOUNT)
     FROM FURNITURE
     WHERE COST>15000;

(b)  SELECT MAX(DATEOFPURCHASE)
     FROM FURNITURE;

(c)  SELECT * FROM FURNITURE
     WHERE DISCOUNT>5 AND FID LIKE "T%";

 (d) SELECT DATEOFPURCHASE FROM FURNITURE
     WHERE NAME IN ("Dining Table", "Console
Table");
```

6. (i) Which command is used to view the list of tables in a database? (1)

(ii) Give one point of difference between an equi-join and a natural join. (1)

7. Consider the table, **MOVIEDETAILS** given below: (2)

Table: MOVIEDETAILS

MOVIEID	TITLE	LANGUAGE	RATING	PLATFORM
M001	Minari	Korean	5	Netflix
M004	MGR Magan	Tamil	4	Hotstar

M010	Kaagaz	Hindi	3	Zee5
M011	Harry Potter and the Chamber of Secrets	English	4	Prime Video
M015	Uri	Hindi	5	Zee5
M020	Avengers: Endgame	English	4	Hotstar

(a) Identify the degree and cardinality of the table.
(b) Which field should be made the primary key? Justify your answer.

OR

(a) Identify the candidate key(s) from the table **MOVIEDETAILS.**
(b) Consider the table **SCHEDULE** given below:

Table: SCHEDULE

SLOTID	**MOVIEID**	**TIMESLOT**
S001	M010	10 AM to 12 PM
S002	M020	2 PM to 5 PM
S003	M010	6 PM to 8 PM
S004	M011	9 PM to 11 PM

Which field will be considered as the foreign key if the tables **MOVIEDETAILS** and **SCHEDULE** are related in a database?

		SECTION – B **Each question carries 3 marks**	
8.		Julie has created a dictionary containing names and marks as key value pairs of 6 students. Write a program, with separate user defined functions to perform the following operations: ● Push the keys (name of the student) of the dictionary into a stack, where the corresponding value (marks) is greater than 75. ● Pop and display the content of the stack. For example: If the sample content of the dictionary is as follows:	(3)

<table>
<tr><td></td><td></td><td>R={"OM":76, "JAI":45, "BOB":89, "ALI":65, "ANU":90, "TOM":82}

The output from the program should be:
TOM ANU BOB OM

OR

Alam has a list containing 10 integers. You need to help him create a program with separate user defined functions to perform the following operations based on this list.
● Traverse the content of the list and push the even numbers into a stack.
● Pop and display the content of the stack.

For Example:
If the sample Content of the list is as follows:
N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38]

Sample Output of the code should be:
38 22 98 56 34 12</td><td></td></tr>
<tr><td>9.</td><td>(i)</td><td>A table, ITEM has been created in a database with the following fields:
ITEMCODE, ITEMNAME, QTY, PRICE

Give the SQL command to add a new field, DISCOUNT (of type Integer) to the ITEM table.</td><td>(1)</td></tr>
<tr><td></td><td>(ii)</td><td>Categorize following commands into DDL and DML commands?

INSERT INTO, DROP TABLE, ALTER TABLE, UPDATE...SET</td><td>(2)</td></tr>
<tr><td>10.</td><td></td><td>Charu has to create a database named MYEARTH in MYSQL.
She now needs to create a table named CITY in the database to store the records of various cities across the globe. The table CITY has the following structure:

Table: CITY
<table><tr><th>FIELD NAME</th><th>DATA TYPE</th><th>REMARKS</th></tr><tr><td>CITYCODE</td><td>CHAR(5)</td><td>Primary Key</td></tr><tr><td>CITYNAME</td><td>CHAR(30)</td><td></td></tr><tr><td>SIZE</td><td>INTEGER</td><td></td></tr></table></td><td>(3)</td></tr>
</table>

AVGTEMP	INTEGER		
POLLUTIONRATE	INTEGER		
POPULATION	INTEGER		

Help her to complete the task by suggesting appropriate SQL commands.

Section C
Each question carries 4 marks

11. Write queries (a) to (d) based on the tables **EMPLOYEE** and **DEPARTMENT** given below: (4)

Table: EMPLOYEE

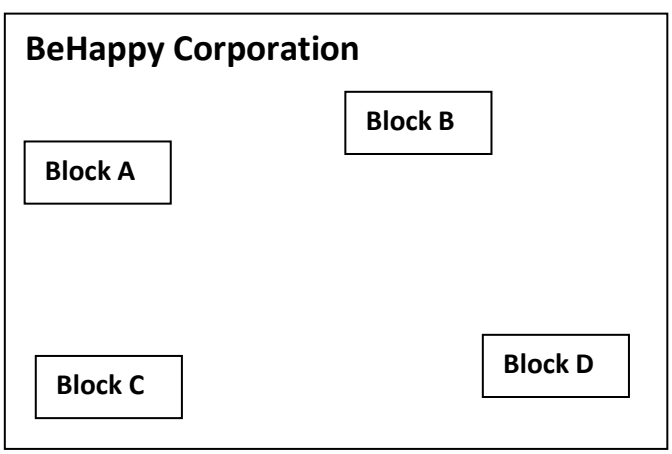
EMPID	NAME	DOB	DEPTID	DESIG	SALARY
120	Alisha	23-Jan-1978	D001	Manager	75000
123	Nitin	10-Oct-1977	D002	AO	59000
129	Navjot	12-Jul-1971	D003	Supervisor	40000
130	Jimmy	30-Dec-1980	D004	Sales Rep	
131	Faiz	06-Apr-1984	D001	Dep Manager	65000

Table: DEPARTMENT

DEPTID	DEPTNAME	FLOORNO
D001	Personal	4
D002	Admin	10
D003	Production	1
D004	Sales	3

(a) To display the average salary of all employees, department wise.

(b) To display name and respective department name of each employee whose salary is more than 50000.

		(c) To display the names of employees whose salary is not known, in alphabetical order. (d) To display DEPTID from the table **EMPLOYEE** without repetition.	
12.	(i)	Give two advantages and two disadvantages of star topology **OR** Define the following terms: **www, web hosting**	(2)
	(ii)	How is packet switching different from circuit switching?	(2)
13.		BeHappy Corporation has set up its new centre at Noida, Uttar Pradesh for its office and web-based activities. It has 4 blocks of buildings.  Distance between the various blocks is as follows: A to B 40 m B to C 120m C to D 100m A to D 170m B to D 150m A to C 70m Numbers of computers in each block Block A - 25	(4)

		Block B - 50 Block C - 125 Block D - 10 (a) Suggest and draw the cable layout to efficiently connect various blocks of buildings within the Noida centre for connecting the digital devices. (b) Suggest the placement of the following device with justification i. Repeater ii. Hub/Switch (c) Which kind of network (PAN/LAN/WAN) will be formed if the Noida office is connected to its head office in Mumbai? (d) Which fast and very effective wireless transmission medium should preferably be used to connect the head office at Mumbai with the centre at Noida?	

Marking Scheme

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		Section -A **Each question carries 2 marks**		
Q. No	**Part No.**	**Question**	**Marking Instructions**	**Marks**
1.		Characteristics of Stacks: • It is a LIFO data structure • The insertion and deletion happens at one end i.e. from the top of the stack	1 mark for each point	(2)
2.	(i)	SMTP : Simple Mail Transfer Protocol XML: Extensible Mark Up Language	½ mark for each correct expansion	(1)
	(ii)	Wired- optical fibre Wireless – microwave	½ mark for each correct answer	(1)
3.		char(n): • stores a fixed length string between 1 and 255 characters • if the value is of smaller length, adds blank spaces • some space is wasted varchar(n) : • stores a variable length string • no blanks are added even if value is of smaller length • no wastage of space	1 mark for each correct difference (minimum 2 differences to be given)	(2)

<table>
<tr><td>4.</td><td></td><td>(a) One record
(b) tuple</td><td>1 mark for each correct answer</td><td>(2)</td></tr>
<tr><td>5.</td><td></td><td>(a) 29

(b) 19-Jul-2021

(c)
<table><tr><td>T006</td><td>Console Table</td><td>17-Nov-2019</td><td>15000</td><td>12</td></tr></table>
(d)
10-Mar- 2020
17-Nov-2019</td><td>½ mark for each correct output</td><td>(2)</td></tr>
<tr><td>6.</td><td>(i)</td><td>SHOW TABLES;</td><td>1 mark for correct answer</td><td>(1)</td></tr>
<tr><td></td><td>(ii)</td><td>Equi- join:
• The join in which columns from two tables are compared for equality
• Duplicate columns are shown
Natural Join
• The join in which only one of the identical columns existing in both tables is present
• No duplication of columns</td><td>1 mark for correct difference (Any one point may be given)</td><td>(1)</td></tr>
<tr><td>7.</td><td></td><td>(a) Degree: 5
Cardinality: 6

(b) MOVIEID should be made the primary key as it uniquely identifies each record of the table.</td><td>½ mark each for correct degree and cardinality

½ mark for correct field and ½ mark for justification</td><td>(2)</td></tr>
</table>

		OR (a) MOVIEID and TITLE (b) MOVIEID	½ mark for each correct field name 1 mark for correct answer	
		SECTION – B **Each question carries 3 marks**		
8.		**# Question No 8 (first option)** **R={"OM":76, "JAI":45, "BOB":89, "ALI":65, "ANU":90, "TOM":82}** **def PUSH(S,N):** ** S.append(N)** **def POP(S):** ** if S!=[]:** ** return S.pop()** ** else:** ** return None** **ST=[]** **for k in R:** ** if R[k]>=75:** ** PUSH(ST,k)** **while True:** ** if ST!=[]:** ** print(POP(ST),end=" ")** ** else:** ** break** **OR** **# Question No 8 (second option)** **N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38]** **def PUSH(S,N):**	1 mark for correct PUSH operation 1 mark for correct POP operation 1 mark for correct function calls and displaying the output 1 mark for correct PUSH operation	(3)

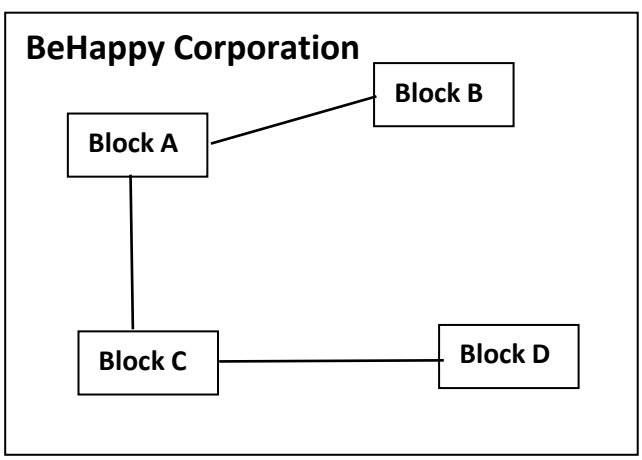
		`  S.append(N)`
		`def POP(S):`
		`  if S!=[]:`
		`  return S.pop()`
		`  else:`
		`  return None`
		`ST=[]`
		`for k in N:`
		`  if k%2==0:`
		`  PUSH(ST,k)`
		`while True:`
		`  if ST!=[]:`
		`  print(POP(ST),end=" ")`
		`  else:`
		`  break`
			1 mark for correct POP operation
			
			1 mark for correct function calls and displaying the output
			
			Note: Marks to be awarded for any other correct logic given by the student	

9.	(i)	`ALTER TABLE Item` `ADD (Discount INT);`	1 mark for correct command	(1)
	(ii)	DDL: **`DROP TABLE, ALTER TABLE`** DML: **`INSERT INTO, UPDATE...SET`**	½ mark for each correct command identified	(2)

10.		`CREATE DATABASE MYEARTH;`
		
		`CREATE TABLE CITY`
		`(`
		`  CITYCODE CHAR(5)PRIMARY KEY,`
		`  CITYNAME CHAR(30),`
		`  SIZE INT,`
		`  AVGTEMP INT,`
		`  POPULATIONRATE INT,`
		`  POPULATION INT,`
		`);`
			1 mark for correctly creating database.
			
			2 marks for correctly creating the table.
				(3)

		Section C **Each question carries 4 marks**		
11.		`(a) SELECT AVG(SALARY)`		

		FROM EMPLOYEE **GROUP BY DEPTID;** **(b) SELECT NAME, DEPTNAME** **FROM EMPLOYEE, DEPARTMENT** **WHERE** **EMPLOYEE.DEPTID=** **DEPARTMENT.DEPTID** **AND SALARY>50000;** **(c) SELECT NAME FROM EMPLOYEE** **WHERE SALARY IS NULL** **ORDER BY NAME;** **(d) SELECT DISTINCT DEPTID** **FROM EMPLOYEE;**	1 mark for each correct query	(4)
12.	(i)	Advantages • Ease of service • Centralized control • Easy to diagnose faults • One device per connection Disadvantages • long cable length • difficult to expand • central node dependency OR **www**: a set of protocols that allow you to access any document on the internet through the naming systems based on URLs **Web hosting**: Web hosting is a service that allows organizations and individuals to post a website or web page onto the server, which can be viewed by everyone on the Internet.	½ mark for each correct advantage / disadvantage 1 mark for each correct definition	(2)
	(ii)	Packet switching: • uses store and forward concept to send messages • no physical path is actually establishes • message is divided into smaller parts, known as packets and then sent forward • tight upper limit on block size • Each data unit knows only the final receiver's address	1 mark for each correct difference (minimum two points should be given)	(2)

		Circuit switching • physical connection is established between sender and receiver • Each data unit knows the entire path from sender to receiver • It does not follow store and forward concept		
13.		(a)  (b) Repeater : between C and D as the distance between them is 100 mts. Hub/ Switch : in each block as they help to share data packets within the devices of the network in each block (c) WAN. (d) Satellite	1 mark for each correct answer	(4)

[6]