### 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

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

5.  
(a) 29  
(b) 19-Jul-2021  
(c)  
(d)  
<table>
<thead>
<tr>
<th>T006</th>
<th>Console Table</th>
<th>17-Nov-2019</th>
<th>15000</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. (a) 29  
(b) 19-Jul-2021  
(c)  
(d) 10-Mar-2020  
17-Nov-2019  
½ mark for each correct output  
(2)

6. (i) SHOW TABLES;  
1 mark for correct answer  
(1)

(ii) 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  
1 mark for correct difference (Any one point may be given)  
(1)

7. (a) Degree: 5  
Cardinality: 6  
½ mark each for correct degree and cardinality  
(2)

(b) MOVIEID should be made the primary key as it uniquely identifies each record of the table.  
½ mark for correct field and ½ mark for justification  
(2)
OR

(a) MOVIEID and TITLE ½ mark for each correct field name

(b) MOVIEID 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

[3]
```python
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
```

<table>
<thead>
<tr>
<th>Mark</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mark for correct POP operation</td>
<td></td>
</tr>
<tr>
<td>1 mark for correct function calls and displaying the output</td>
<td></td>
</tr>
</tbody>
</table>

Note: Marks to be awarded for any other correct logic given by the student

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

| (3) | 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. |

Section C
Each question carries 4 marks

| 11. | (a) SELECT AVG(SALARY) | |

[4]
### 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;

<table>
<thead>
<tr>
<th>12. (i)</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ease of service</td>
<td></td>
</tr>
<tr>
<td>• Centralized control</td>
<td></td>
</tr>
<tr>
<td>• Easy to diagnose faults</td>
<td></td>
</tr>
<tr>
<td>• One device per connection</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>(ii)</th>
<th>Packet switching:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• uses store and forward concept to send messages</td>
<td></td>
</tr>
<tr>
<td>• no physical path is actually establishes</td>
<td></td>
</tr>
<tr>
<td>• message is divided into smaller parts, known as packets and then sent forward</td>
<td></td>
</tr>
<tr>
<td>• tight upper limit on block size</td>
<td></td>
</tr>
<tr>
<td>• Each data unit knows only the final receiver’s address</td>
<td></td>
</tr>
</tbody>
</table>

1 mark for each correct query

½ mark for each correct advantage/disadvantage

1 mark for each correct definition

1 mark for each correct difference

(minimum two points should be given)
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) BeHappy Corporation

(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