**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

<table>
<thead>
<tr>
<th>Q. No</th>
<th>Part No.</th>
<th>Question</th>
<th>Marking Instructions</th>
<th>Marks</th>
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</thead>
</table>
| 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 | 1 mark for each correct difference (minimum 2 differences to be given) | (2) |
|       |          | `varchar(n)`:
  - stores a variable length string
  - no blanks are added even if value is of smaller length
  - no wastage of space | | |
4. (a) One record tuple  
   (b) 1 mark for each correct answer

5. (a) 29  
   (b) 19-Jul-2021  
   (c) T006 Console Table  
   (d) 10-Mar-2020  
   17-Nov-2019  
   15000  
   12

   ½ mark for each correct output

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

   (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)

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

   (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]
<table>
<thead>
<tr>
<th>Question</th>
<th>Code</th>
<th>Marks</th>
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<tbody>
<tr>
<td>9. (i)</td>
<td><code>ALTER TABLE Item ADD (Discount INT);</code></td>
<td>1 mark for correct command</td>
</tr>
<tr>
<td>9. (ii)</td>
<td><strong>DDL</strong>: DROP TABLE, ALTER TABLE <strong>DML</strong>: INSERT INTO, UPDATE...SET</td>
<td>½ mark for each correct command identified</td>
</tr>
<tr>
<td>10.</td>
<td><code>CREATE DATABASE MYEARTH;</code> <code>CREATE TABLE CITY</code> <code>(CITYCODE CHAR(5) PRIMARY KEY, CITYNAME CHAR(30), SIZE INT, AVGTEMP INT, POPULATIONRATE INT, POPULATION INT, );</code></td>
<td>1 mark for correctly creating database. 2 marks for correctly creating the table.</td>
</tr>
<tr>
<td>11.</td>
<td>(a) <code>SELECT AVG(SALARY)</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SQL Queries</td>
<td>Points</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>(a)</td>
<td><code>SELECT DEPTID FROM EMPLOYEE GROUP BY DEPTID;</code></td>
<td>1 mark</td>
</tr>
<tr>
<td>(b)</td>
<td><code>SELECT NAME, DEPTNAME FROM EMPLOYEE, DEPARTMENT WHERE EMPLOYEE.DEPTID=DEPARTMENT.DEPTID AND SALARY&gt;50000;</code></td>
<td>4</td>
</tr>
<tr>
<td>(c)</td>
<td><code>SELECT NAME FROM EMPLOYEE WHERE SALARY IS NULL ORDER BY NAME;</code></td>
<td></td>
</tr>
<tr>
<td>(d)</td>
<td><code>SELECT DISTINCT DEPTID FROM EMPLOYEE;</code></td>
<td></td>
</tr>
</tbody>
</table>

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.

(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 definition
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