09-06-2026 SE IT SEM-III (NEP-2020) DMSA QP CODE: 20009278

**Duration: 2 Hours** **[Max Marks:60]**

**N.B. : (1) Question No 1 is Compulsory.**
**(2) Attempt any three questions out of the remaining five.**
**(3) All questions carry equal marks.**
**(4) Assume suitable data, if required and state it clearly.**

**1** **Attempt any THREE** **[15]**

**a** Explain the advantages of DBMS over File system **[5]**

**b** Define primary key and candidate key with example. **[5]**

**c** Explain the following Relational algebra operations with suitable examples. **[5]**
(i) Natural Join (ii) Union

**d** What are the views in SQL? Explain with an example. **[5]**

**2** **a** Explain need of normalization along with the all the normal forms. **[8]**

**b** What do you mean by serializability of a schedule? Check whether the given schedule S is conflict-serializable? **[7]**

| T1 | T2 |
|---|---|
| Read(A) | |
| Write(A) | |
| | Read(A) |
| | Write(A) |
| Read(B) | |
| Write(B) | |
| | Read(B) |
| | Write(B) |

**3** **a** Explain security and authorization in SQL in detail. **[8]**

**b** Define transitive functional dependency. List all the functional dependencies satisfied by the given relation. **[7]**

| a | b | c |
|---|---|---|
| a1 | b1 | c1 |
| a1 | b1 | c2 |
| a2 | b1 | c1 |
| a2 | b1 | c3 |

**4** **a** Explain in detail the different users of the database system. How do they interact with the database system? Explain in detail? **[8]**

**b** Explain DML and DCL commands in SQL. **[7]**

**5** **a** Explain Generalization, Specialization and Aggregation with example. **[8]**

**b** Explain ACID properties of transactions. **[7]**

**6** **a** Explain the following relational algebra operations with examples : **[8]**
i) Cartesian Product ii) Left Outer Join iv) Set Difference v) Select

**b** Explain functions and procedures in SQL with examples. **[7]**



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