### [6180]-45

# T.E. (Computer Engg./Artificial Intelligence & Data Science)
# DATABASE MANAGEMENT SYSTEM
## (2019 Pattern) (Semester - I) (310241)

*Time : 2½ Hours]*          *[Max. Marks : 70*

*Instructions to the candidates:*

1) *Answer Q. 1 or Q. 2, Q. 3 orQ. 4, Q. 5or Q. 6, Q.7 or Q.8.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Assume suitable data, if necessary.*

**Q1)** a) What is anomaly in relational model. Explain how normalization can be used to reduce the anomalies. **[9]**

b) Explain 2NF and 3NF and BCNF with example. **[9]**

**OR**

**Q2)** a) What are relational integrity constraints. Explain with example Domain constraints, Referential-Integrity and enterprise constraints. **[9]**

b) Elaborate the significance of codd's rule. Explain 12 rules proposed by codd's. **[9]**

**Q3)** a) Explain the concept of conflict serializability with suitable example. Since every conflict-serializable schedule is view serializable, why do we emphasize conflict serializability rather than view serializability?

**[9]**

b) Explain the two-phase lock protocol for concurrency control. Also explain its two versions: strict two-phase lock protocol and rigorous two-phase lock protocol. **[8]**

**OR**

*P.T.O.*

*Q4)* a) What is R-timestamp(Q) and W-timestamp(Q) Explain the necessary condition used by time stamp ordering protocol to execute for a read / write operation. **[8]**

b) To ensure atomicity despite failures we use Recovery Methods Explain in detail following Log-Based Recovery methods with example. **[9]**

    i) Deferred Database Modifications

    ii) Immediate Database Modifications

*Q5)* a) Compare SQL and NOSQL Database. **[6]**

b) Explain BASE Properties of NOSQL Database. **[6]**

c) Explain Document Based and Key value data model of NOSQL Database. **[6]**

OR

*Q6)* a) Explain the CRUD operations used in MongoDB with example. **[6]**

b) State and Explain CAP Theorem. **[6]**

c) Explain Map Reduce with example. **[6]**

*Q7)* a) What are spatial data. Explain Geographic and Geometric data. **[8]**

b) What is the significance of XML databases? Explain with proper example when to use XML database. **[9]**

OR

*Q8)* a) Write a short note on complex data types : **[8]**

    i) Semi-structured data

    ii) Features of semi-structured data models

b) What is object relational database system. Explain Table inheritance with example. **[9]**

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