

Total No. of Questions : 8]

SEAT No. :

P-7537

[Total No. of Pages : 2

[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 or Q. 4, Q. 5 or 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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