

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]
