

Total No. of Questions : 8]

SEAT No. :

PC-1718

[Total No. of Pages : 2

[6353]-35

**T.E. (Computer Engg) (AI & DS)**  
**DATABASE MANAGEMENT SYSTEM**  
**(2019 Course) (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 the impact of insert, update & delete anomaly on overall design of 8 M database? How is normalization used to remove these anomalies? Explain with suitable example. [8]

b) What is functional dependency? Explain its use in database design. Consider the instance of the relation Market (MarketName, Product, Stock): [9]

Market Name	Product	Stock
S1	Toothpaste	14
S1	Biscuits	8
S1	Shampoo	8
S2	Toothpaste	30
M1	Chocolates	50
M2	Cakes	14

Identify the functional dependencies that can be found in the given instance.

OR

**Q2) a)** Elaborate the significance of CODD's rule. Explain 12 rules proposed by CODD's. [8]

P.T.O.

- b) What is decomposition? Explain the desirable properties of decomposition? Consider the relation F (FN, PN, C, D) with the following Functional Dependencies: [9]

FD1: FN, PN  $\rightarrow$  C

FD2: C  $\rightarrow$  D

FD3: D  $\rightarrow$  F

If Fig is decomposed into F1(FN, PN, C) and F2(C, D). Check decomposition is lossless or lossy?

- Q3)** a) How to ensure the atomicity using Recovery Methods? Explain the log based recovery method in detail. [9]  
b) What is need of lock in DBMS? Explain shared lock and exclusive lock with the help of example. [9]

OR

- Q4)** a) When do deadlocks happen, how to prevent them, and how to recover if deadlock takes place? [9]  
b) 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. [9]

- Q5)** a) Explain the CAP theorem referred during the development of any distributed application. [8]  
b) Explain how NOSQL databases are different than relational databases? Describe in detail the column NOSQL data model with example. [9]

OR

- Q6)** a) Draw and explain architecture of Distributed database system. State the reasons for building distributed database systems. [8]  
b) Explain structured, Semi-structured and Unstructured data types with examples. [9]

- Q7)** a) What is the significance of XML databases? Explain with example the use of XML databases. [9]  
b) What is object relational database? What are its advantages and disadvantages? [9]

OR

- Q8)** a) What are spatial data? Explain Geographic and Geometric data. [9]  
b) Explain how encoding and decoding of JSON object is done in JAVA with example. [9]

