

Total No. of Questions : 8]

**PD4241**

SEAT No. :

[Total No. of Pages : 2

**[6403]-35**

**T.E. (Computer Engineering) (A.I.D.S)**  
**DATA BASE MANAGEMENT SYSTEM**  
**(2019 Pattern) (Semester - V) (310241)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Answers 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 and delete anomaly on overall design of database? How normalization is used to remove these anomalies? [8]
- b) Elaborate the significance of CODD's rule. Explain 12 rules proposed by CODD's. [9]

**OR**

- Q2)** a) What are the desirable properties of decomposition? Explain it with example. [8]
- b) Explain partial, full and transitive dependency with examples. [9]

- Q3)** a) How to ensure the atomicity using Recovery Methods? Explain the log based recovery method in detail. [9]
- b) When do deadlocks happen, how to prevent them, and how to recover if deadlock takes place? [9]

**OR**

**P.T.O.**

**Q4)** a) What is conflict serializability? How to check schedule is conflict serializable schedule? Explain with one example. [9]

b) Explain two phase locking protocol. Consider the following two transactions.

T1 : read (A);

read (B);

if A = 0 then B := B + 1;

Write (B).

T2 : read (B);

read (A);

if B = 0 then A := A + 1; Write (A).

Add lock and unlock instructions to transactions T1 and T2, so that they observe the two phase locking protocol. Can the execution of these transactions result in a deadlock?

**Q5)** a) Explain the CAP theorem referred during the development of any distributed application. [8]

b) Explain the NOSQL database types with examples and write down the real time applications. [9]

OR

**Q6)** a) Explain Structured, Semi-structured and Unstructured data types with examples. [9]

b) List the different NOSQL data models. Explain following NOSQL database types with examples. [8]

i) Column-oriented

ii) Document-oriented

**Q7)** a) What is the significance of XML databases? Explain with example the use of XML databases. [9]

b) What is Deductive Database. Explain its features and state its advantages over traditional database. [9]

OR

**Q8)** a) Write a short note on complex data types: [9]

i) Semi-structured data

ii) Features of semi-structured data models

b) Explain how encoding and decoding of JSON object is done in JAVA with example. [9]

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