

Total No. of Questions : 8]

SEAT No. :

**PD4241**

[Total No. of Pages : 2

**[6403]-35**

**T.E. (Computer Engineering) (A.I.D.S)  
DATABASE 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. [9]

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]

\* \* \*