

Total No. of Questions : 8]

SEAT No. :

P-268

[Total No. of Pages : 3

[6003]-346

T.E. (Computer/A.I.D.S.)

## DATABASE MANAGEMENT SYSTEM

(2019 Pattern) (Semester - I) (End Sem.) (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 database? How normalization is used to remove these anomalies?

[6]

- b) Explain different features of good relational database design. [6]
- c) Explain following Codd's rules with suitable examples : [6]
- i) Guaranteed Access Rule
  - ii) Comprehensive Data Sub-Language Rule
  - iii) High-Level Insert, Update, and Delete Rule

OR

**Q2)** a) Explain entity and referential integrity constraints used in SQL. [6]

- b) Define 3NF. Explain with example, how to bring the relation in 3NF? [6]

- c) Explain following Codd's rules with suitable examples : [6]
- i) Physical Data Independence
  - ii) Integrity Independence
  - iii) Systematic Treatment of NULL Values

P.T.O.

- Q3)** a) State and explain the ACID Properties. During its execution, a transaction passes through several states, until it finally commits or aborts. List all possible sequences of states through which a transaction may pass. Explain the situations when each state transition occurs. [9]
- b) Check whether following schedule is view serializable or not. Justify your answer. (Note :  $T_1$  &  $T_2$  are transactions). Also explain the concept of view equivalent schedules and conflict equivalent schedule considering the example schedule given below : [8]

$T_1$	$T_2$
read (A) $A := A - 50$  write (A) read (B) $B := B + 50$ write (B)	read (A) $temp := A * 0.1$ $A := A - temp$ write (A) read (B)  $B := B + temp$ write (B)
OR	

- Q4)** a) Suppose a transaction  $T_i$  issues a read command on data item Q. How time-stamp based protocol decides whether to allow the operation to be executed or not using time-stamp based protocol of concurrency control. Explain the situations when each state transition occurs. [9]
- b) Write a short note on : [8]
- i) Log based recovery
  - ii) Shadow Paging

**Q5)** a) BASE Transactions ensures the properties like Basically Available, Soft State, Eventual Consistency. What is soft state of any system, how it is depend on Eventual consistency property? [6]

b) Enlist the different types of NOSQL databases and explain with suitable examples. [8]

c) What is structured and unstructured data. Explain with example. [4]

OR

**Q6)** a) Explain the CAP theorem referred during the development of any distributed application. [6]

b) Analyze the use of NOSQL databases in current social networking environment also explain need of NOSQL databases in social networking environment over RDBMS. [6]

c) Explain the difference between SQL and NOSQL database. [6]

**Q7)** a) Write a short note on emerging databases : [9]

i) Active and Deductive Databases

ii) Main Memory Databases

b) What is object relational database system. Explain Table inheritance with example. [8]

OR

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

i) Semi-structured data

ii) Features of semi-structured data models

b) Describe spatial data like Geographic data and Geometric data. [8]

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