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SEAT No. :

[Total No. of Pages : 3

[Max. Marks :

[6003]-346

T.E. (Computer/A.I.D.S.) DATABASE MANAGEMENT SYSTEM

(2019 Pattern) (Semester - I) (End Sem.) (310241)

Time : 2¹/₂ Hours] 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]

[6]

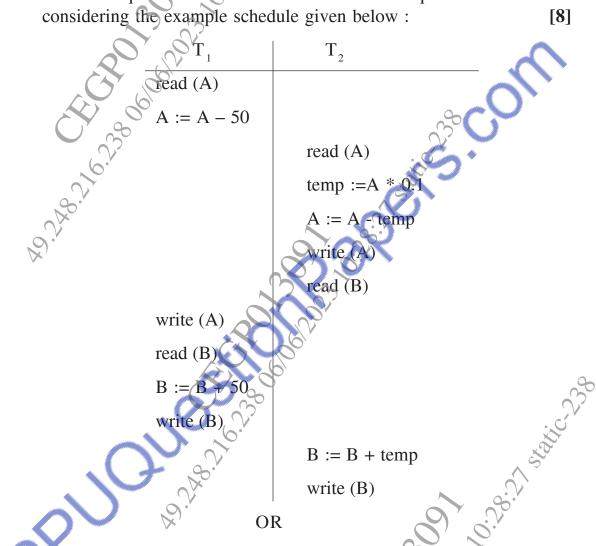
- b) Explain different features of good relational database design. [6]
- c) Explain following Codd's rules with suitable examples :
 - i) Guaranteed Access Rule
 - ii) Comprehensive Data Sub-Language Rule
 - iii) High-Level Insert, Update, and Delete Rule

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]

OR

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

- 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]



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

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- **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]**
 - Enlist the different types of NOSQL databases and explain with suitable b) examples. [8]
 - What is structured and unstructured data. Explain with example. [4] c) OR
- Explain the CAP theorem referred during the development of any **Q6**) a) distributed application. **[6**]
 - Analyze the use of NOSQL databases in current social networking b) environment also explain need of NOSQL databases in social networking environment over RDBMS. [6]

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

Write a short note on emerging databases [9] **Q**7) a)

- Active and Deductive Databases
- Main Memory Databases ii)
- What is object relational database system. Explain Table inheritance b) with example. [8]

OR

- **Q8**) a) Write a short note on complex data types :
 - i) Semi-structured data
 - Features of semi-structured data models ii)
 - etric da hore of the optimized of the o [8] Describe spatial data like Geographic data and Geometric data b)

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