SEAT No. :

PA-1441

[5926]-57

T.E. (Computer / A.I.D.S. Engg)
DATABASE MANAGEMENT SYSTEMS
(2019 Pattern) (Semester - I) (310241)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:
1) *Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Assume suitable data, if necessary.*

Q1) a) Justify the impact of normalization on database? Explain 2nd normal form, 3rd normal form and BCNF with example. **[8]**

    b) Elaborate the significance of codd's rule. Explain 12 rules proposed by codd's. **[9]**

OR

Q2) a) What is the impact of insert, update and delete anomaly on overall design of database? How is normalization used to remove these anomalies? **[9]**

    b) Explain 3NF and BCNF and give its example. Also enlist their differences. **[8]**

Q3) 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 in detail time stamp based protocol. **[9]**

    b) Explain the concept of conflict serializability with suitable example. Since every conflict-serializable schedule is view serializable, why do we emphasize conflict serializability rather than view serializability? **[9]**

OR

Q4) a) State and explain the ACID properties. During its execution a transaction passes though 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) A transaction may be waiting for more time for an Exclusive (X) lock on an item, while a sequence of other transactions request and are granted as Shared (S) lock on the same item. What is this problem? How is it solved by two phase lock protocol? **[9]**

P.T.O.

Q5) a) Explain how NOSQL databases are different than relational databases? Describe in detail the key value store NOSQL data model with example.**[9]**

b) Explain BASE properties with its significance. How soft state of system is depending on Eventual consistency property? **[8]**

<div align="center">OR</div>

Q6) a) List the different NOSQL data models. Explain document store NOSQL data model with example. **[9]**

b) State and explain the concept of CAP theorem and BASE properties with example. **[8]**

Q7) a) Write short note on : **[9]**
i) Active databases
ii) Deductive databases

b) What is the significance of XML databases? Explain with proper example when to use XML database. **[9]**

<div align="center">OR</div>

Q8) a) Difference between relational databases and object relational databases with example **[9]**

b) Describe the significance of JSON data type and object. Discuss with syntax all JSON data types with suitable example. **[9]**