

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)	
$A := A - 50$	
	read (A)
	temp := A * 0.1
	$A := A - temp$
	write (A)
	read (B)
write (A)	
read (B)	
$B := B + 50$	
write (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]
- Log based recovery
  - 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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