

Total No. of Questions : 10]

SEAT No. :

P2514

[Total No. of Pages : 3

[5253] - 543

T.E. (Information Technology) (Semester - I)

Database Management Systems

(2015 Pattern)

Time : 2½ Hours]

[Max. Marks :70

Instructions to the candidates:

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of calculator is allowed.*
- 5) *Assume Suitable data if necessary.*

- Q1)** a) Discuss the fundamental operations in relational algebra with example. [3]
- b) Explain different types of attributes of an entity with example. [3]
- c) Draw and list different components of database system structure. [4]

OR

- Q2)** a) List E-R diagram symbols. & draw an E-R diagram for a hospital management system with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examination conducted. [6]
- b) Consider the following database [2]
- Student (RollNo, Name, Address)
- Subject (Sub_code, Sub_name)
- Marks (Roll_no, Sub_code, Marks)
- Write following queries in SQL.
1. Find average marks of each student, along with the name of student
- c) Differentiate between horizontal and vertical fragmentation. [2]
- Q3)** a) Explain various types of outer join operations with example. [5]
- b) What is lossless decomposition? Suppose that we decompose the schema $R=(A,B,C,D,E)$ into (A,B,C) and (A,D,E) , show that this decomposition is a lossless decomposition if the following set F of functional dependencies holds: $A \rightarrow BC$ $CD \rightarrow E$ $B \rightarrow D$ $E \rightarrow A$. [5]

P.T.O.

OR

- Q4)** a) Explain embedded and dynamic SQL. [5]
b) Discuss various MYSQL data types [5]
- Q5)** a) Explain the CRUD operations in MongoDB with suitable example.[4]
b) What is fragment of relation? What are the main types of fragmentation? Why a fragmentation is useful concept in distributed database design? [6]
c) List down all the possible crash recovery methods. Explain shadow paging with proper example. [8]

OR

- Q6)** a) Explain Architecture of Parallel & Distributed Databases. [6]
b) Explain different database architectures. [6]
c) What is deadlock? Explain how deadlock detection and prevention is done. [6]
- Q7)** a) Explain the following terms in XML with examples : [6]
i) Documents ii) Elements
iii) Nested/sub elements iv) Attributes
v) Namespace vi) DTD
vii) Schema
b) What are the different data types in JSON? Discuss about JSON object and ARRAY in details. [5]
c) What is HDFS? Explain HBase data model and HBase region. [5]

OR

- Q8)** a) What is XML Schema? Give XML Schema for the following banking system: account (account_number, branch_name, balance)
Customer(customer_number, customer_street, customer_city),
Depositor(customer_number, account_number) [6]
b) What is concurrency control? Explain time stamp based concurrency control. [6]
c) Compare with suitable examples : [4]
i) RDBMS and XML
ii) JSON and XML

- Q9)** a) What is Data Warehouse? Explain Schemas in Data Warehouse. [8]
b) What is OLTP & OLAP? Explain different OLAP operations. [8]

OR

- Q10)**a) Write short note on: (any two) : [8]
i) SQLite database
ii) Machine learning for big Data
iii) Machine learning for BI.
b) What is KDD process? Explain KDD process in detail. [8]

