Total No. of Questions : 10]

SEAT No. :

P2514

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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→BC CD → E B→D E → 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]**