Total No. of Questions : 6]

SEAT No. :

P3702

[Total No. of Pages : 2

Engg. - 49

T.E. (Computer Engineering) (Semester - I)

Database Management Systems Applications (In Sem.)

(2012 Pattern)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

Q1) a) Draw the E-R diagram which model University Database. **[4]**

i) List the entity sets and their primary keys.

ii) Extend the E-R diagram, using aggregation, to model the case where we want to record evaluations of a student by a guide on a project

b) Explain View and Index in SQL with suitable example. **[4]**

c) Consider relational schema **Employee** (*Empno, EName, DeptNo, Salary*), **Department**(*DeptNo, DName*) **Write SQL Queries for following questions (Any two)** **[2]**

i) List Employee Names of 'Computer' Department.

ii) Find average salary of each department.

iii) Find Department name of employee name 'Amit'

OR

Q2) a) Consider the following Relations. It defines the schema of the database application for a bank. It manages the branches and customers of the bank. Customers take loans (borrow money) or open accounts (deposit money) at one or more branches. **[4]**

Branch (B_No, B_name, B_city, asset) , Customer (C_No, C_Name, C_city, Street)

Loan (Loan_no, B_name, amount), Account (Acc_No, B_name, Balance)

Borrower (C_No, Loan_No), Depositor (C_No, Acc_No)

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Write SQL Queries for following questions (Any two)

i) Find loan data, ordered by decreasing amounts, then increasing loan numbers.

ii) Find the pairs of names of different customers who live at the same address but have accounts at different branches.

iii) Find the names and address of customers who have a loan for an amount exceeding 3 times their current balance.

b) Explain 1NF & 2NF (Normal Form) with suitable example. **[4]**

c) List Advantages of a DBMS over file-processing systems. **[2]**

Q3) a) Explain CAP theorem and BASE properties in NoSQL Database with suitable example. **[4]**

b) Consider schema User (user_id, age, status). Write MongoDB Schema statements for following queries **(Any four) :** **[4]**

i) Create Collection and Document

ii) Insert Data and Update Document

iii) Find all the users whose age is equal to 50 or status is "A"

iv) Update the user's age increment by 3 whose status is "A"

v) Delete the users whose status is "A"

c) List difference between Relational Database and NoSQL Database. **[2]**

OR

Q4) a) Explain Aggregation using MongoDB with suitable example. **[4]**

b) List different NoSQL Data Models. Explain document based NoSQL data model in short. **[4]**

c) Explain sharding (Horizontal Scaling) in MongoDB. **[2]**

Q5) a) Explain two phase locking protocol with suitable example. **[4]**

b) What is Serializability? Explain Conflict Serializability with suitable example. **[4]**

c) Explain Performance Tuning in NoSQL in short. **[2]**

OR

Q6) a) Explain Timestamp based and log based concurrency control protocol. **[4]**

b) Explain Query Optimization in Relational Database. **[4]**

c) Explain different Database Transaction States. **[2]**

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