Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

Subject code: 2620003
Subject Name: Database Management System - II **Date: 01-06-2016**
Time: 10.30a.m. To 01.00p.m. **Total Marks: 70**
Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 (a) Do as directed: **7**

1. A transaction can do read and write operation on a data item when it acquires :____ (A.) read mode (B.) exclusive mode (C.) shared mode (D.) write mode

2. In dirty read problem .....
   a. one transaction reads an uncommitted value of another transaction
   b. one transaction reads the committed value for another transaction
   c. one transaction reads another transaction.
   d. one transaction commits another transaction.

3. ..... protocol is used to perform multiple transactions that execute on different database.
   A. commit B. two phase lock C. two phase commit D. locking

4. Transaction ..... ensures that the transaction are being executed successfully.
   a. concurrency b. consistency
   b. serialisability d. non serialiasability

5. Mark True or False : (Checkpoints is used when search process is time consuming.)

6. Data Abstraction can be _____, ____ and _____.

7. Write True or False " Schema loads a database into the instance".

(b) Answer the following questions in brief: **7**

1. Give property of 2NF.
2. Define Functional Dependency
3. List various symbols of ERD with its purpose.
4. Which of the relational algebra operations do not require the participating tables to be union-compatible?
5. Define isolation property of transaction.
6. Differentiate between Disjoint Constraint vs. Overlapping Constraint
7. State any 4 Armstrong Rules.

Q.2 **(a)** Give benefits of ERD and Discuss types of Entities and types of attributes in ERD with examples. **7**

(b) In a shopping mall, there are several departments, each department have several employees, from whom one employee is manager who looks after that department only. Sometimes when some employee is on leave than other employee from any department can be temporarily send to other department.
A department is associated with number of items, Items are identified by unique number and have description and cost. These items are purchased by the customer, Customer have unique identity & address and records date and time when item is purchased by the customer. Draw ERD for the given case and convert it into relations. **7**

OR

(b) Explain the concept of Specialization and Aggregation in ERD with example. **7**

Q.3 **(a)** "Every BCNF is in 3NF but reverse not true". Justify the statement and Explain the concept of 2NF with example. **7**

(b) **7**

Find all possible Candidate key for the following Functional Dependency
R= { A,B,C,D,E} and also find whether the above Functional Dependency falls under which normal form (1NF/2NF/3NF).

A relation R (ABCDE) with id set of FDs:
A -> BC
C -> DE
D -> E

OR

Q.3 **(a)** Why Normalization is required? Explain the concept of Closure of Functional Dependency with example. **7**

(b) List all different operators found in Relational Algebra and Discuss any three Relational Algebra operators giving example. **7**

Q.4 **(a)** Discuss Atomicity and Durability properties of transaction giving example. **7**

(b) Write Relational Algebra Query for the given schema. **7**

Account(account_number ,branch_name ,balance)
Branch(branch_name ,branch_city, assets)
Depositor(customer_name, account_number)
Loan(loan_number, branch_name, amount)
Borrower(customer_name, loan_number)
Customer(customer_name, customer_street ,customer_city)

1. Select those tuples of the loan Relation where the branch is "Bombay"
2. Find those customers who live in Karelibaug of baroda city.
3. List all loan numbers with maximum amount of the loan
4. Name of all customers who have either a loan or an account
5. Delete all account records in the Surat branch
6. Insert information in the database specifying that person Raj has $1200 in account A-973 at the Surat branch.
7. Find all customer who has account but not taken any loan.

OR

Q.4 **(a)** Discuss concept of Multivalued Dependency and give its difference with Functional Dependency. **7**

Q.4 **(b)** Define deadlock. Discuss Deadlock Avoidance and Prevention techniques. **7**

Q.5 **(a)** What is serializabiltiy. Discuss conflict serializablity. **7**

(b) What is Concurrency control? Discuss concurrency control problems giving example. **7**

OR

Q.5 **(a)** State and discuss the Two-phase locking protocol. **7**

(b) Discuss stable storage structure. Explain concept of Immediate Data Modification. **7**

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