

GUJARAT TECHNOLOGICAL UNIVERSITY
M.C.A.- SEMESTER – II • EXAMINATION – WINTER 2012

Subject code: 620006**Date: 27-12-2012****Subject Name: Database Management System - II****Time: 02:30 pm – 05:00 pm****Total Marks: 70****Instructions:**

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

Q1(a) What is concurrency control? Explain three main problems of concurrency control. [7]

Q1(b) Discuss query analysis, semantic analysis and query simplifier stage of query decomposition. [7]

Q2(a) State whether the following statements are TRUE or FALSE, Justify. [7]

- (i) During the query processing the syntax of the query is checked by compiler.
- (ii) Shadow paging technique maintains two page tables.
- (iii) Serialisability describes the concurrent execution of several transactions.
- (iv) Mandatory access control is based on the concept of access rights.
- (v) Parallel database system has the disadvantage of skew problem.
- (vi) Authorization is the process by which a user's identity is checked.
- (vii) Certification is a phase of optimistic methods for concurrency control.

Q2(b) What is two phase locking? Explain with schematic diagram and example? Will two phase locking results in deadlock? Justify your answer with the help of an example. [7]

Or

Q2(b) Which data is recorded on the transaction log. Explain with an example. List different states of transaction. [7]

Q3(a) What is threat in a database environment? Explain different threats and types of database security issues. [7]

Q3(b) Explain four levels of transaction consistency. Discuss concept of lock granularity. [7]

Or

Q3(a) Explain two types of access control techniques that are used in database security system. [7]

Q3(b) Explain different types of database failures. Discuss about media recovery. [7]

Q4(a) What is buffer? Explain buffer management technique used in database recovery. [7]

Q4(b) What do you mean by distributed database? Explain its properties and functions. List different types of distributed databases. [7]

Or

Q4(a) Explain two techniques that are used for recovery from non physical or transaction failure. [7]

Q4(b) What is object oriented database? What are its characteristics? Differentiate between object and object identity with an example. [7]

Q5(a) List various relational algebra operators, their notation and function. Explain Cartesian product and assignment operator with suitable example. [7]

Q5(b) Discuss any six transformation rules for query optimization and also discuss steps of Heuristic Optimization algorithm. [7]

Or

Q5(a) Write short notes about [7]

(i) Query processing

(ii) Statistical database security

Q5(b) [7]

(i) Explain project, rename and division operator of relational algebra with suitable example.

(ii) Consider the following relations:

PROJECT(project, project_name, developer)

EMPLOYEE(empno, empname)

ASSIGN_TO(project, empno)

The key fields are underlined. Write the following queries in relational algebra.

(i) Get empno of employees working on project COM103

(ii) Find the employee numbers of employees who do not work on project COM105.

* * * * *