Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA. Sem-II Examination June 2011

Subject code: 620006 Subject Name: Database Management System-II

Date: 27-06-2011 Total Marks: 70 Time: 2:30pm TO 5:00pm

Instructions:

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

Q.1 (a) What do you mean by schedule? Differentiate between serial and serializable schedule and explain the concept of conflict serializability. **07**

(b) 1. " Database must ensure proper execution of transaction " Explain how transaction can maintain integrity of data . **4+3**
2. Discuss advantages of concurrent execution of transaction.

Q.2 (a) Fill in the blanks **07**

1. _____ means number of transactions executed in a given amount of time.
2. _____ is a phenomenon in which single transaction leads to series of transaction rollback.
3. The most widely used structure for recording database modification is _____.
4. Two Phase locking protocol ensures _____ serializability.
5. _____ protocol to ensure that system will never enter deadlock state.
6. The _____ modification technique allows database modification to be output to database while transaction is still in active state.
7. _____ parallelism refers to execution of single query in parallel on multiple processor/disk.

(b) 1. Discuss Timestamp ordering protocol. **4+3**
2. List various phases of Two Phase Locking protocol. Give benefit and disadvantages of strict two phase locking protocol.

OR

(b) 1. Explain concept of Wait-die and Wound-wait deadlock prevention schemes. **4+3**
2. Discuss how deadlock is detected.

Q.3 (a) Differentiate between Deferred Database Modification and Immediate Database Modification recovery techniques. **07**

(b) Discuss various types of Access Control Techniques for Database Security. **07**

OR

Q.3 **(a)** Differentiate between Database Buffering and Log Record Buffering techniques. **07**

(b) Why there is a need for Database Security? What is the role of DBA in database security? Discuss Threats to database security. **07**

Q.4 **(a)** Discuss Distributed Data Storage in Distributed Databases. **07**

(b) Write Relational Algebra for the given queries. **07**

EMP(emp_no, emp_nm, gender, age)

DEPENDENT(emp_no,depend_no,depend_name, relation)

1. List employees with its dependents.
2. Retrieve name of employees who has no dependent.
3. For every employee, retrieve total number of dependents.
4. Retrieve name of employee who is youngest.
5. Retrieve name of all female employees.
6. Retrieve name of all male employees with older age.
7. Retrieve name of all employees and its dependents which has only 'mother' as a relation.

OR

Q.4 **(a)** Differentiate between Object Relational Data model and Object Oriented data model in Object Based Databases. **07**

Q.4 **(b)** In Relational Algebra, discuss, with example how DML statements can be represented? **07**

Q.5 **(a)** What do you understand by Query Decomposition? Discuss with example Query Analysis phase. **07**

(b) 1. Discuss any five equivalence rules for transformation of relational expression. **4+3**

2. Draw various forms of query evaluation plan for given a SQL query as : select emp_name from employee where salary < 5000.

OR

Q.5 **(a)** Discuss concept of Query Processing in brief **07**

(b) 1. What do you understand by Query Optimization? Give drawback of cost based optimization and benefit of heuristic optimization. **4+3**

2. Give heuristic rules/algorithm for transformation of relational expression.

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