Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA Integrated - SEMESTER–III • EXAMINATION – WINTER 2016

Subject Code: 4430604 **Date:25/11/ 2016**

Subject Name: Database Management Systems

Time: 10:30am to 1:00pm **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)** (i) Explain how transaction can maintain integrity of data. **07**
(ii) What is transaction state transition diagram? Draw it and explain all the states of transaction.

(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. **07**

Q.2 **(a)** What is the purpose of cost estimation in query optimization? Explain various cost components of query execution. **07**

(b) Fill in the blanks: **07**

1. _____ is an attribute which can uniquely identify a row in a table.
2. Level ___ transaction is the minimum consistency requirement that allows a transaction to be recovered in the event of system failure.
3. A system designed to prevent unauthorized access to or from a public network is referred as _____.
4. Query _____ means always giving an optimal strategy as the execution plan.
5. Number of tuples in a relation is called _____.
6. Union, Intersection and division are _____ operations.
7. Mandatory access control is based on the concept of _____.

OR

(b) State whether the following statements are true or false with valid reasons: **07**

1. During the query processing the syntax of the query is checked by compiler.
2. Cascading Recovery is a phenomenon in which single transaction leads to series of transaction rollback.
3. Concurrent execution of transactions improves throughput of transaction.
4. A query tree is also called a relational algebra tree.
5. Parallel database system has the disadvantage of skew problem.
6. Serializability describes the concurrent execution of several transactions.
7. The deferred modification technique allows database modification to be output to database while transaction is still in active state.

Q.3 **(a)** Discuss query analysis, semantic analysis and query simplifier stage of query decomposition. **07**

(b) Explain serializability. **07**

OR

Q.3 **(a)** Discuss any six transformation rules for query optimization and also discuss steps of Heuristic Optimization algorithm. **07**

	(b)	Explain the following terms: 1. Shadow paging 2. Transaction failure 3. Encryption 4. Automicity 5. Distributed Database 6. Cascadeless schedule 7. Lock	**07**
Q.4	**(a)**	Explain Forward recovery, Backward recovery, Media recovery in brief.	**07**
	(b)	What is database security? Discuss various threats to database security.	**07**

OR

Q.4	**(a)**	Explain differed database modification and immediate database modification and list difference between them.	**07**
	(b)	Explain grant and revoke privileges with example for discretionary access control.	**07**
Q.5	**(a)**	Differentiate the following: Parallel Database Vs. Distributed Database.	**07**
	(b)	(i) Explain the concept of deadlock with example. (ii) Discuss different ways for deadlock prevention and detection.	**07**

OR

Q.5	**(a)**	What is object oriented database? What are its characteristics? Differentiate between object and object identity with an example.	**07**
	(b)	Differentiate between Database Buffering and Log Record Buffering techniques.	**07**

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