GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012

Subject code: 171602   **Date: 27/12/2012**
Subject Name: Distributed Database Application & System
Time: 10.30 am - 01.00 pm   **Total Marks: 70**
Instructions:
1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** What is query processing in a relational database? Explain in detail with an example. How does it differ from distributed query processing? **07**

(b) Explain Levels of data and process distribution in distributed environment. **05**

(c) What is site autonomy in distributed DBMS? Explain in brief. **02**

Q.2 **(a)** What is distributed transaction and how does if differ from remote transaction? Explain with an example. **04**

(b) Under which situations will it be beneficial to have replication or fragmentation of data? **03**

(c) Consider a relation that is fragmented horizontally by *plant-number*: **07**
employee (name, address, salary, plant-number)
Assume each fragment has two replicas (1) stored at the New York site (2) locally at the plant site.
Describe a good processing strategy for the following queries entered at the San Jose site.
   a. Find all employees at the Boca plant.
   b. Find the average salary of all employees.
   c. Find the highest-paid employee at each of the following sites: Toronto,
   Edmonton, Vancouver, Montreal
   d. Find the lowest-paid employee in the company

OR

(c) Consider a failure that occurs during 2PC for a transaction. For each possible failure, explain how 2PC ensures transaction atomicity despite the failure? **07**

Q.3 **(a)** Explain view management in centralized as well as distributed DBMS. **06**

(b) Explain the following terms: **04**
   (i) Fragmentation transparency
   (ii) Replication transparency

(c) Explain Client/Server database architecture. **04**

OR

Q.3 **(a)** Consider the following relation **06**
employee (person-name, street, city)
works(person-name. company-name, salary)
company(company-name, city)
manages(person-name,, manager-name)
Write following query in relational algebra form.
   (1) Find names of all employees who work for First Bank Corporation (FBC).
   (2) Find the names of all employees who live in the same city as the company for which they work.
   (3) Find names, street addresses and cities of residence of all employees who

work for FBC and earn more than $10,000 per year

	(b)	Distinguish between tightly coupled and loosely coupled systems.	**04**
	(c)	Explain Reference architecture of DDBMS with proper diagram.	**04**

Q.4 **(a)** Explain top-down and bottom-up design strategies. **07**

(b) What do you mean by query optimization? Explain System R (centralized) query optimization algorithm. **07**

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OR

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Q.4 **(a)** Differentiate individual assertion and self-oriented assertion and how to enforce these assertions in DDBMS? **07**

(b) Explain peer-to-peer distributed systems. **07**

Q.5 **(a)** What are the major Distributed DBMS components? Explain each in detail with proper diagram. **07**

(b) Explain various transaction states and properties in detail. **07**

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OR

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Q.5 **(a)** What is authorization control? How do imply authorization control in a distributed environment? **07**

(b) Differentiate between partitioned and replicated databases. Discuss the fundamental issues while designing a distributed database. **07**

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