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Paper Id: 

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Sub Code: NCS 067

Roll No. 

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**B.TECH**  
**(SEM VI) THEORY EXAMINATION 2017-18**  
**Distributed Database**

*Time: 3 Hours*

*Total Marks: 100*

**Note:** 1. Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

1. **Attempt all questions in brief.** **2 x 10 = 20**
- a. What is DBA? Mention the functionalities of DBA
  - b. Give the difference between vertical, horizontal and hybrid fragmentation.
  - c. What is the use of Data Model?
  - d. What is transaction log? What are its functions?
  - e. What is an Instance? Explain schema wrt instance.
  - f. Explain view serializability.
  - g. What is shadow paging?
  - h. Define Integrity and Consistency of data.
  - i. Distinguish between 3NF and BCNF.
  - j. Discuss the lost update and dirty read anomaly.

**SECTION B**

2. **Attempt any three of the following:** **10 x 3 = 30**
- a. Discuss the objectives of distributed query processing. Explain the various phrases in distributed query processing in detail.
  - b. Explain the basic Timestamp Ordering Algorithm.
  - c. What are the various concurrency control techniques? Compare Lock based Concurrency Control strategies in detail.
  - d. What do you mean by query optimization? Explain System R (centralized) query optimization algorithm.
  - e. What problem can occur in a distributed system due to the failure of link and partitioning of the network? What are the ways by which recovery can take place?

**SECTION C**

3. **Attempt any one part of the following:** **10 x 1 = 10**
- (a) What are the various kinds of transparencies in distributed database design? Explain each with the help of example.
  - (b) Explain conflict serializability. How serializability is detected. Give example.
4. **Attempt any one part of the following:** **10 x 1 = 10**
- (a) What is Two Phase Locking Protocol? What are its types? Give graphical representation of each.
  - (b) Explain the Cost Based Query Optimization for Distributed Database in detail.

5. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Generate an algorithm for synchronous check pointing in a Distributed Database System
  - (b) What do you mean by time stamping protocols for concurrency control? Discuss multi-version scheme of concurrency control also.
6. Attempt any *one* part of the following: 10 x 1 = 10
- (a) What do you mean by Integrity Constraint. Also write the following queries in SQL:  
 SUPPLIER(Supplier\_id,supplier\_name, supplier\_add)  
 PARTS(part\_id, part\_name, color)  
 CATALOG(supplier\_id,part\_id,cost).
    - a) Find the names of the supplier who supply yellow parts.
    - b) Find the names of the supplier who supply both blue and yellow parts.
    - c) Find the names of supplier who supply all parts.
  - (b) lives(person-name, street ,city)  
 works(person-name, company-name ,salary)  
 located-in(company- name ,city)  
 manages(person-name, manager-name)  
 Write the following queries in Relational Algebra:
    - a) Find the name of all employees who work for the City Bank company .
    - b) Find the name, street and city of all employees who work for City Bank and earn more than \$10,000.
    - c) Find all employees who live in the same city as the company they work for.
    - d) Find all persons who do not work for City Bank.
    - e) Find all employees who live in the same city and on the same street as their manager.
7. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Compare Distributed Deadlock prevention to Distributed Deadlock Avoidance. Explain one scheme of Distributed deadlock Detection and Recovery.
  - (b) Describe Wait/Die and Wound/Wait deadlock protocols.