MCA

(SEM V) THEORY EXAMINATION 2021-22

DISTRIBUTED DATABASE SYTEM

Time: 3 Hours *Total Marks: 70*

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

SECTION A

1. **Attempt *all* questions in brief.** **2 x 7 = 14**
   a. Define the concepts of recoverable, cascade less and strict schedules.
   b. Define Dirty Read problem.
   c. Define Moss Concurrency protocol?
   d. Define the term Checkpoint?
   e. What is bushy join tree?
   f. What is total cost equation of query execution in distributed system?
   g. Explain derived horizontal fragmentation.

SECTION B

2. **Attempt any *three* of the following:** **7 x 3 = 21**
   a. Explain the ACID properties of transaction.
   b. Justify that three-phase commit (3PC) protocol is a non-blocking protocol.
   c. Explain the architecture of locking scheduler.
   d. What is deadlock detection? Also explain the protocols for deadlock detection in distributed database system.
   e. Determine the given schedule is conflict serializable or not. If yes, also determine the equivalent serial schedule. S: r1(X); r3(X); w1(X); r2(X); w3(X);

SECTION C

3. **Attempt any *one* part of the following:** **7 x 1 = 7**
   (a) What are serial and serializable schedule? Why are serial and serializable schedule considered correct?
   (b) Define schedule and serializable schedule. Check whether the following schedule is conflict serializable or not: r3(x); r2(x); r1(x); w3(x); w1(x);

4. **Attempt any *one* part of the following:** **7 x 1 = 7**
   (a) How does Thomas's Write Rule modify the check for the write_item(X) operation?
   (b) How does strict timestamp ordering differ from basic timestamp ordering?

5. **Attempt any *one* part of the following:** **7 x 1 = 7**
   (a) What do you mean by Shadow Paging? Explain the various distributed locking schemes?
   (b) Discuss the issues to achieve atomicity in distributed transaction management system.

6. **Attempt any *one* part of the following:** **7 x 1 = 7**
   (a) Explain in brief the various query optimization techniques and write their advantages and disadvantages.
   (b) Analyze the condition of orphan message generation and discuss the ways to avoid this condition.

7. **Attempt any *one* part of the following:** **7 x 1 = 7**
   (a) Compare join with semi join approach in distributed database system and analyze the scenarios of preference.
   (b) Compare the eager and lazy replication techniques and discuss the advantages of each method

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