

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]  
(2125)

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**B. Tech 6th Semester Examination**  
**Relational Data Base Management System (OS)**  
**CS-6004**

**Time : 3 Hours**

**Max. Marks : 100**

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D of the question paper and all the subparts of the questions in Section E.

**SECTION - A**

1. (a) What do you understand by query optimization? Explain the each components of query optimizer with block diagram. (10)
- (b) Why it is not desirable to force users to make an explicit choice of a query processing strategy? Are there cases in which it is desirable for users to be aware of the costs of competing query-processing strategies? Explain your answer. (10)
2. (a) What do you understand by a serial execution and serializable execution of a transaction? Explain why serializable execution is preferred. What is conflict serializability and view serializability?
- (b) Consider two transactions  $T_1, T_2$  and a schedule S with two transactions  $T_1, T_2$  being executed in interleaved fashion. Discuss how the Isolation between  $T_1$  and  $T_2$  guarantees the serializability of schedules. (12+8=20)

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**SECTION - B**

3. What is two-phase locking protocol? Discuss some variations of the two phase locking protocol. And also prove that if two-phase policy is violated then it may not be possible to serialize the execution of concurrent transactions. (20)
4. (a) What is shadow paging? How it is different from log-based recovery? (10)
- (b) Make a list of security concerns for a bank. For each item on your list, state whether this concern relates to physical security, human security, operating system Security, or database security. (10)

**SECTION - C**

5. What is an Object Oriented Database Management System (OODBMS)? Is an OODBMS a viable alternative to an RDBMS? What are the tradeoffs and benefits of using an OODBMS over an RDBMS? (20)
6. Is it possible to successfully map a binary M:N relation type without requiring a new relation? Justify your answer with suitable example. (20)

**SECTION - D**

7. What is the client server architecture in distributed data base systems? What do you understand with thin and thick clients? Discuss the environments best-suited for these architectures separately. (20)
8. Explain distributed databases, distributed transactions and distributed query processing in detail. (20)

**SECTION - E**

9. (a) Differentiate between Temporal and Deductive databases.
- (b) Write a short note on estimation of query processing cost.
- (c) Why is query expressed in relational algebra preferred over query expressed in SQL?
- (d) Write advantages of distributed databases.
- (e) Explain the disadvantages of horizontal partitioning for distributed databases.
- (f) Explain under what circumstances a snapshot replication approach would be best.
- (g) What is distributed deadlock?
- (h) Inconsistent retrieval can arise as dirty read or as unrepeatable reads. What is inconsistent retrieval problem in the above statement?
- (i) Differentiate between Active databases and Deductive databases.
- (j) Explain the purpose of the checkpoint mechanism.
- (10×2=20)