

OCTOBER 2012

**P/ID 16106/PITB/
KAF**

Time : Three hours

Maximum : 75 marks

PART A — (5 × 5 = 25 marks)

Answer ALL questions.

1. (a) Describe with a block diagram of architecture of distributed database.

Or

- (b) Write an application that requires the student number from the terminal and output of the name and department at levels 1, 2, 3 of transparency.

2. (a) Describe the structure of operator query tree with examples.

Or

- (b) What are the problems obtained in the query optimization?

3. (a) Define (i) Serializability and (ii) Serial. What are the two sufficient conditions to ensure that two schedules are equivalent?

Or

- (b) How is time stamp used in ordering the events in distributed system?

4. (a) How are the avoidance based detection algorithms classified? Compare their performance characteristics.

Or

- (b) Describe the features of object query processor architectures.

5. (a) Explain the dynamic processing model of execution for hierarchical systems that dynamically perform intra and inter operator load balancing with shared memory nodes.

Or

- (b) Explain the significance of interferences and convoy effect in parallel databases.

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.

6. (a) Describe in detail of bottom top approach
(b) Consider the following two allocations of fragments:
1: R₁ at site 1; R₂ at site 2; R₃ at site 3
2: R₁ and R₂ at site 1; R₂ and R₃ at site 3

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With the following applications (all with same frequency of activation):

A1, issued at site 1, reads 5 records of R_1 and 5 records of R_2

A2, issued at site 3, reads 5 records of R_3 and 5 records of R_2

A3, issued at site 2, reads 10 records of R_2

- (i) If we take locality of reference as objective, which solution is the best?
- (ii) If we take complete locality of applications as objective, which solution is the best?
- (iii) Assume now that A3 updates 10 records of R_2 . Taking the locality of references as objective,
Which solution is the best?

7. Give an example of global schema, fragmentation schema, and additional semantic knowledge, such that all this transformation can be used for deducing the simplification of a query.
8. Explain 3 phase commit protocol and write a local recovery procedure for it.
9. Explain the (a) object and (b) page types of client/server server architectures. Compare their performance.

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10. Describe the (a) shared-memory (b) Shared -disk (c) Hierarchical and (d) NUMA parallel systems architectures. Compare their features and performance.
 11. What are the properties of transactions? What are the different types of transactions? Give example of each. Explain the structure of a 2PL lock graph. What does it imply?
 12. Describe in detail the recovery of distributed transactions. Draw a diagram to show a reference model of distributed transaction recovery and indicate the role of transaction manager.
 13. What are integrity constraints? What are tier uses? How are they specified in distributed databases. Explain with examples.
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