

Code No: K0523

R07

Set No. 1

IV B.Tech. II Semester Regular Examinations, April, 2011
DISTRIBUTED DATABASES
(Computer Science & Engineering)

Time: 3 Hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain Vertical fragmentation and Mixed fragmentation in brief.
b) Explain the reference architecture for distributed databases. [6+10]
2. a) Discuss query processing with an example.
b) Explain with an example how operator tree and operator graph are helpful in finding the common sub expressions. [8+8]
3. a) Explain the effect of Commuting Joins and Unions
b) What is a profile and calculate the profile for Group-by, Union, Join operations? Explain how these estimating profiles of results of algebraic operations are helpful in optimization. [8+8]
4. Explain the following:
a) Computational structure of distributed transactions
b) Communication structure for commit protocols [8+8]
5. Explain Optimistic methods for Distributed Concurrency control. [16]
6. Write the termination algorithm for 3-phase-commitment assuming that the coordinator site has failed, that no network partition has occurred, and that the operational sites have a consistent view of the network. [16]

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7. Explain the following in brief :

- a) Object Migration
- b) Pointer Swizzling
- c) Query processing Issues

[5+5+6]

8. a) Explain Database Interoperability in brief.

b) Explain Multi-database Concurrency Control in brief

c) Query Processing Layers in Distributed Multi-DBMSs.

[4+6+6]

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Set No. 2

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1. Explain different types of fragmentation. [16]
2. (a) Explain how fragmented relation simplification is done.
(b) Explain with an example the extensions of relational algebra for group-by and properties of group-by operations. [8+8]
3. (a) What are the different optimization issues w.r.to distributed join and non distributed join. Explain with suitable example.
(b) What is a profile and calculate the profile for Selection, Projection operations? Explain how these estimating profiles of results of algebraic operations are helpful in optimization. [8+8]
4. Explain the 2-phase commitment protocol. What are the different kinds of failures and how it is resilient to all failures? [16]
5. Explain the following:
 - (a) Serializability in a distributed database
 - (b) Time stamping
 - (c) False Deadlocks
 - (d) Hierarchical controllers. [4+4+4+4]

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6. Explain the following in detail:
- (a) Detection of Inconsistencies
 - (b) Checkpoints.
 - (c) Cold Restart
- [6+5+5]
7. (a) Explain transactional management in Object DBMSs.
(b) Explain the Architecture of Object Query Processor.
- [8+8]
8. Explain the following:
- (a) Query optimization issues in Multi-DBMSs.
 - (b) Multi-database Recovery
- [8+8]

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Set No. 3

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1. a) Explain the reference architecture for distributed databases
b) Explain horizontal and derived horizontal fragmentation in brief [10+6]

2. a) Explain GROUP BY operation for evaluating aggregate functions in Distributed Data bases.
b) Draw an operator tree and show the simplification for the following query.
For given EMP and DEPT relations, assuming the necessary attributes, a query to give the names of employees who work in a department whose manager has number 333 but who do not earn more than 50,000/- is as given below.
$$PJ_{EMP.NAME}((EMP \Join_{DEPTNUM = DEPTNUM} SL_{MGRNUM=333} DEPT) DF$$
$$(SL_{SAL > 50000} EMP \Join_{DEPTNUM = DEPTNUM} SL_{MGRNUM=333} DEPT)).$$
 [8+8]

3. a) Explain optimization graphs for DDB.
b) Explain the use of semi-join programs for Join Queries. [8+8]

4. a) What is an agent and explain how the functions of these agents in distributed transactions with an example.
b) Explain the concurrency control based on Locking in Distributed Databases. [8+8]

5. Explain concurrency control based on time-stamps. [16]

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6. a) Explain Nonblocking commitment protocols with site failures.
b) Explain the following in brief:
 (i) Primary site approach
 (ii) Authorization and Protection [8+8]
7. a) Explain the Page server architecture.
b) Write a note on Object Migration and Transaction as Objects [8+8]
8. Explain the following in detail:
a) Distributed Component Object Model
b) COM/OLE and Database Interoperability. [8+8]

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Answer any FIVE Questions
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1. Explain distribution transparency for Read only applications and Update applications. [16]
2. a) Explain parametric queries in detail.
b) Explain how simplification of horizontally fragmented relations and joins between horizontally fragmented relations with suitable examples [8+8]
3. a) Explain about semi-join reduction in DDB.
b) What is a profile and calculate the profile for Selection, Projection operations? Explain how these estimating profiles of results of algebraic operations are helpful in optimization. [8+8]
4. a) Explain the properties of transactions and goals of transactional management.
b) Explain the basic 2-phase commitment protocol. [8+8]
5. Explain the mechanism of distributed Deadlock detection and Deadlock prevention. [8+8]
6. Explain the following in detail:
a) Detection of Inconsistencies
b) Resolution of Inconsistencies. [8+8]
7. Explain the following in brief :
a) Transactional Management in Object DBMSs.
b) Object Query Processor architecture
c) Object Migration [6+6+4]
8. a) Explain query processing layers in Distributed Multi-DBMSs.
b) Explain Distributed Component Object Model [8+8]