

Code No: 07A80506

R07**Set No. 2**

IV B.Tech II Semester Examinations, April/May 2012

DISTRIBUTED DATABASES**Computer Science And Engineering****Time: 3 hours****Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the following:
 - i. Crash recovery
 - ii. Transaction recovery
 - iii. Database recovery.(b) Write about the concurrency control based on locking in distributed databases. [8+8]
2. Discuss about deadlock detection using centralized and hierarchical controllers. [16]
3. Discuss the following for distributed databases:
 - (a) Operator tree construction
 - (b) Fragmented queries
 - (c) Semi-joins with example
 - (d) Relational algebra rules. [16]
4. (a) Write about horizontal and vertical fragmentation.
(b) Given a global relation
EMP(EMPNUM, NAME, SAL, TAX, MGRNUM, DEPTNUM)
Write the mixed fragmentation definition and fragmentation tree of relation EMP. [8+8]
5. Explain the following in detail:
 - (a) Semistructured data
 - (b) Client cache management
 - (c) OLAP servers. [4+6+6]
6. Explain briefly about the following:
 - (a) Distributed garbage collection
 - (b) Pointer swizzling. [10+6]
7. Explain in detail about Object Naming and Catalog Management with Site Autonomy. [16]
8. (a) Explain about semi-join reduction in DDB.

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- (b) Discuss about the distribution of access strategy to different sites. Explain the issues involved and how they are tackled. [8+8]

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Answer any FIVE Questions
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1. (a) Explain about semi-join reduction DDB.
 (b) Discuss the problems in query optimization. [8+8]
2. (a) Write about transaction management in DDB.
 (b) Write about the concurrency control based on locking in distributed databases. [8+8]
3. Explain about OLAP servers in detail. [16]
4. Write in brief about the following:
 - (a) Security issues in distributed databases
 - (b) Privacy issues in distributed databases.
 - (c) Redundancy problem in distributed databases. [3+3+10]
5. Explain the following approaches:
 - (a) Write-locks-all
 - (b) Weighted majority locking. [8+8]
6. (a) Classify 2- phase locking, time stamps and optimistic methods.
 (b) Explain Validation using only transaction time stamps. [8+8]
7. (a) Discuss parametric queries in detail.
 (b) Prove that the following two queries have the same semantics

$$^{PJ}NAME, DEPTNUM^{SL}DEPTNUM=15^{EMP}$$

$$^{SL}DEPTNUM=15^{PJ}NAME, DEPTNUM^{EMP}$$
 [8+8]
8. Why do client-server object DBMSs primarily employ data shipping architecture while relational DBMSs employ function shipping? [16]

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1. Explain the following:
 - (a) Multidatabase Concurrency Control.
 - (b) World Wide Web Architecture and Protocols. [12+4]
2. Write about the following:
 - (a) Heterogeneous databases
 - (b) Homogeneous databases
 - (c) Conceptual schema
 - (d) Physical schema. [4+4+4+4]
3. Explain the following Authorization and Protection problems:
 - (a) Site-to-site Protection
 - (b) User Identification. [8+8]
4. (a) Write about the recovery methods of distributed transactions.
 (b) Explain the following:
 - i. Multiple copies of the data
 - ii. Granularity of locking. [8+8]
5. Write a short note on the following:
 - (a) Path Expressions
 - (b) Rewriting and Algebraic optimization
 - (c) Path indexes. [5+8+3]
6. (a) What are the effects of computing Joins and Unions? Explain.
 (b) Discuss the problems in query optimization. [8+8]
7. (a) Consider the data item x . Let $RTM(x)=25$ and $WTM(x)=20$. Let the pair $(R_i(x), TS)$ $(W_i(x), TS)$ denote the read(write) request of transaction T_i on the item x with timestamp TS . Indicate the behaviour of the basic timestamp method with the following sequence of requests.
 - i. $(R_1(x), 19), (R_2(x), 22), (w_3(x), 21)$
 - ii. $(W_4(x), 23), (R_5(x), 28), (W_6(x), 27)$

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- (b) Explain the conservative timestamp method. [10+6]
8. (a) 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 373 but who do not earn more than Rs.100000/- is as given below. Simplify the query explaining the steps involved.
- $^{PJ}EMP.NAME((EMP \ ^{JN}DEPTNUM=DEPTNUM \ ^{SL}MGRNUM=373^{DEPT})$
DF
 $(^{SL}SAL > 100000 \ EMP \ ^{JN}DEPTNUM=DEPTNUM \ ^{SL}MGRNUM=373^{DEPT})$
- (b) Discuss query processing in detail with an example. [8+8]

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1. (a) Discuss how query optimization is useful in distributed databases.
 (b) Discuss the role of optimization graphs in DDB. [8+8]
2. (a) Write about concurrency control based on locking in centralised databases.
 (b) Write about the concurrency control based on locking in distributed databases. [8+8]
3. (a) What is Schedule and Concurrency Control, Discuss briefly?
 (b) Give the conditions to analyze the serializability of a schedule and the correctness of a concurrency control mechanism and explain. [8+8]
4. (a) Prove that the following two queries have the same semantics
 $PJNAME, DEPTNUM^{SL} DEPTNUM = 15^{EMP}$
 $SL DEPTNUM = 15^{PJNAME, DEPTNUM^{EMP}}$
 (b) Draw an operator tree for the following query
 $PJSNUM^{SL} AREA = "North" (SUPPLY^{JN} DEPTNUM = DEPTNUM^{DEPT})$ [8+8]
5. Write about the features of distributed versus centralised databases with illustrations. [16]
6. Explain in detail about cache consistency. [16]
7. Explain the following:
 (a) Delivery schedule generation
 (b) Client cache management. [8+8]
8. (a) Write a short notes on restart protocols for 3-phase-commitment
 (b) Write the structure of a centralized termination protocol for the quorum-based 3-phase-commitment protocol. [6+10]
