Printed Pages : 2 MCA-502(2)

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1437 Roll No.

M.C.A.

(SEM. V) EXAMINATION, 2008-09

DISTRIBUTED DATABASE SYSTEMS

Time : 3 Hours] *[Total Marks : 100*

Note : (1) Attempt all questions.
(2) All questions carry equal marks.

1 Attempt any **four** parts of the following : 5×4=20

(a) List and explain in brief five problems in distributed database system.

(b) What is distributed database system ? Explain in brief.

(c) Discuss the advantages of distributed database over the regular database.

(d) What is global directory ? Explain its characteristics in brief.

(e) Compare the characteristics of a central database and distributed database over a network.

(f) What is computer networks ? List four network topologies and explain them in brief.

2 Attempt any **two** parts of the following : 10×2=20

(a) What is database fragmentation ? Explain it under following headings :

(i) Reasons for fragmentation

(ii) Types of fragmentation

(iii) Degree of fragmentation

(iv) Correctness ruler of fragmentation.

(b) Write the information requirements for horizontal fragmentation. Discuss the characteristics and types of horizontal fragmentation.

(c) Write and explain various types of integrity constraints in context of distributed database system.

Attempt any **two** parts of the following : **10×2=20**

(a) Write and explain the characteristics of query processors.

(b) What is query decomposition ? How redundancy can be remove during the decomposition ?

(c) Explain the following :

(i) Objective of query processing

(ii) Grouping and aggregate function.

Attempt any **two** parts of the following : **10×2=20**

(a) Write the steps and explain of R^* algorithm for distributed query optimization and explain.

(b) Explain various parameters that affect the query optimization in distributed database system.

(c) Explain in brief the various query optimization techniques and write their advantages and disadvantages.

Attempt any **two** parts of the following : **10×2**

(a) Answer the following :

(i) Write and explain the properties of transactions. **6**

(ii) Explain the need of transaction management. **4**

(b) Write and explain 2PL algorithm for concurrency algorithm, write its merits and demerits.

(c) Write the short notes on the following :

(i) Serialisability of the schedule

(ii) Security and protection in distributed database system.

502(2)

Printed Pages : 3 **MCA-353**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1411 Roll No.

M.C.A.

(SEM. V) EXAMINATION, 2007-08

DISTRIBUTED SYSTEMS

Time : 3 Hours] *[Total Marks : 100*

*Note : (1) This paper contains **five** questions.*
*(2) Attempt **all** of them.*

1 Attempt any **four** parts : **5×4=20**

(a) Explain the use of the process control block (PCB). Discuss the contents of PCB. Discuss how the PCB's are chained together to form a list of ready processes?

(b) What is the difference between concurrent process and cooperating process with example? Illustrate the mechanism for interaction between two concurrent processes.

(c) Differentiate between deadlock and starvation. Also, prove that the existence of a cycle in a resource allocation graph is a necessary and sufficient condition for the occulence of a deadlock when there is a single instance of resources and is not a sufficient condition when there are multiple instances of resources.

(d) What is Dining-Philosopher's problem? Solve the Dining-Philosopher problem using semapholes.

(e) Explain the various design issues of a distributed system.

(f) What is naming? Explain the different types of names and how names are organized into name spaces.

Attempt any **four** parts : **5×4=20**

(a) Explain why clock synchronization is required in distributed systems? Differentiate between internal and external clock synchronization in distributed systems.

(b) What are the essential requirements of a mutual exclusion algorithm ? Compare the mutual exclusion algorithms employed in Distributed Systems.

(c) What is physical clock and logical clock? Explain Lamport's algorithm along with drawback. How vector logical clocks can overcome the drawback ?

(d) Describe distributed mutual exclusion algorithm.

(e) Write short notes on the following :
   (i) Global state
   (ii) Termination Detection.

Attempt any **two** parts : **10×2=20**

(a) What are the strategies that are commonly used to handle deadlocks? Explain the various deadlock prevention algorithms.

(b) What is Byzantine Agreement Problem? Give the solution to Byzantene Agreement Problem.

(c) Write short note on any **two** of the following :
   (i) System Models
   (ii) Consensus Problem
   (iii) Atomic commit is distributed database system.
   (iv) Resource Vs communication deadlocks.

4 Attempt any **two** parts : 10×

(a) Discuss the design issues for distributed file system.

(b) Explain the various algorithms that are employe for doing caching in client memory. How cach can be made consistent in distributed systems

(c) Write short notes on any **two** of the following :

(i) Distributed scheduling

(ii) Fault Tolerance

(iii) Task Migration

(iv) Client-Server Model.

5 Attempt any **two** parts : 10×

(a) Balanced Sliding Window Protocol.

(b) Destination base routing algorithm.

(c) Wave Algorithms

(d) Election algorithms.
