B. Tech.

(SEM. VIII) EXAMINATION, 2006-07

DISTRIBUTED SYSTEM

Time : 3 Hours] [Total Marks : 100

Note : Attempt all questions.

1 Attempt any four parts : 5×4=20

(a) What are distributed systems? Name two advantages and two disadvantages of distributed system over centralized ones. Explain in your own words the concept of parallelism transparency.

(b) Give five types of hardware resource and five types of data or software resource that can be shared. Give example of their sharing as it occurs in distributed systems.

(c) Why is computer clock synchronization necessary? Describe the design requirement for a system to synchronize the clocks in a distributed system?

(d) Give an example execution of the ring-based algorithm to show that processes are not necessarily granted entry to critical section in happened before order.

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(e) Explain the Bully algorithm.
(f) What are vector clocks? What are the advantages of vector clock over Lamport clock?

2 Attempt any two parts: 10×2=20
(a) What are Phantom Deadlocks? Explain the algorithm which could detect phantom deadlocks?
(b) Construct a solution to reliable, totally ordered multicast in a synchronous system, using a reliable multicast and a solution to the consensus problem.
(c) What are Agreement Protocols? What are Agreement and validity objectives of Byzantine Agreement Problems?

3 Attempt any two parts: 10×2=20
(a) What do you mean by the Distributed object model? Write a short note on Remote method invocations.
(b) What do you mean by Digital Signature? Explain the different methods for generating and verifying signatures.
(c) What is the difference between a file service using the upload/download model and one using the remote access model? What is the difference between tree structured directory system from a general graph structured system?

4 Attempt any two parts: 10×2=20
(a) Describe how a non-recoverable situation could arise if write locks are released after the last operation of a transaction but before its commitment.

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(b) What are the advantages and drawbacks of multiversion timestamp ordering in comparison with the ordering timestamp ordering.

(c) Explain the difference between linearizability and sequential consistency, and why the latter is more practical to implement, in general?

5 Attempt any two parts: 10x2 = 20

(a) What is Routing? What is Destination based routing?

(b) What is Election Algorithm? Suppose that two processes detect the demise of the coordinator simultaneously and both decide to hold an election using the bully algorithm. What happens?

(c) Write short notes on:

(i) ARP problem

(ii) Deadlock free Packet Switching.