# BACHELOR OF INFORMATION TECHNOLOGY
SUPPLIMENTARY EXAMINASTION, 2017
4th year, 1st semester
Distributed Systems

Time: 3 Hours

Full Marks: 100

Note: Answer any five questions

1. (a) What is distributed systems? List and explain different types of transparency in distributed systems.

   (b) Describe different kinds of failure in Distributed Systems. How are they dealt in distributed systems?

   (3+7+6+4)

2. (a) Describe Logical Clock. In what way is Vector Clock better than Logical Clock? Explain the implementation problems of Logical Clocks.

   (b) Calculate the logical clock values of events a-j in the communication between two processes P, Q (Shown in Figure).
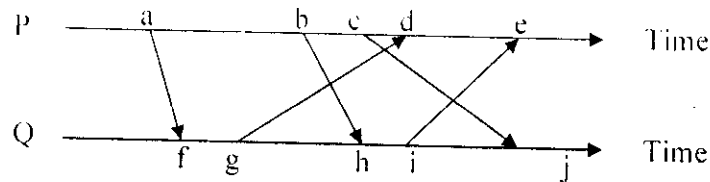
   (c) Calculate the vector clock values of ten events a-j in the diagram. Use the vector clock values to prove that (d, h) are concurrent events, but f is casually ordered before e.   (2+3+2+7+6)

3. (a) Describe Ricart-Agrawala's algorithm to ensure mutual exclusion in a distributed system.

   (b) A sender P sends a sequence of messages to a receiver Q. Each message m is stamped with a bounded sequence number seq whose value ranges from 0 to M-1. If channels can reorder messages, then is it possible to design a protocol for FIFO message delivery that will only tolerate message loss? Do not worry if the receiver accepts duplicate copies of the same messages. Explain your answer.

   (c) Give a situation where Maekawal's algorithm can enter into a deadlock.   (8+6+6)

4. (a) Define 'Global State'. Discuss the use of cuts of a distributed Computation. When does a cut become inconsistence?

   (b) Explain the Chandy-Lamport Algorithm for finding out the Distributed Snapshot.

   (3+3+4+10)

5. (a) What are the issues in Distributed File System ?

   (b) What are the major goals of Sun NFS?

   (c) Write a note on Andrew file system.

   (d) In the context of Distributed System explain following-

   i) Mounting ii) Caching iii) Replication

   (4+3+4+3x3)

6. Write a short on the following-

   (a) Distributed File Systems Architecture

   (b) Distributed System failures

   (c) Heartbeat algorithms

   (d) Synchronization delay

   (5x4)