Faculty of Engineering & Technology

Eighth Semester B.E. (Computer Science) Examination

TOPICS IN DISTRIBUTED SYSTEM

(New)

Paper—01

Elective—III

Sections—A&B

Time—Three Hours] [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Answer **THREE** questions from Section A and **THREE** questions from Section B.

(3) Assume suitable data wherever necessary.

(4) Illustrate your answers wherever necessary with the help of neat sketches/examples.

SECTION—A

1. (a) What is a distributed operating system ? What are the limitations of a distributed operating system ? 5

   (b) Explain the working of Lamport's logical clock. How is the limitation of Lamport's clock removed in vector clocks ? 8

2. (a) What is buffering ? List the buffer options in message passing model. 5

   (b) State Singhal's heuristic algorithm for mutual exclusion. Also give the performance of this algorithm. 8

3. (a) Explain the working of Ricart-Agrawal algorithm. Give its performance. 6

(b) State and explain the conditions for building request sets in Maekawa's algorithm. 4

(c) What are the requirements of a distributed mutual exclusion algorithm ? 4

4. (a) Explain the working of Ho-Ramamoorthy's one-phase deadlock detection algorithm. 6

(b) Explain the working of Chandy-Misra-Haas algorithm for distributed deadlock detection using edge chasing approach. 7

5. (a) Consider a system with 4 processors, A, B, C, D out of which source processor 'A' is faulty. Source processor 'A' sends a '*' message to processor B and D. Using Dolev et al's algorithm, show whether an agreement will be reached or not. 8

(b) Explain the working of Raymond's tree based algorithm. 5

SECTION—B

6. (a) How do the following issues affect distributed shared memory structure in a distributed system :

(i) granularity

(ii) page replacement ? 6

(b) Write a short note on Andrew File System. 7

7. (a) Write any 2 algorithms used for implementing distributed shared memory. 8

(b) What are the different issues in task migration ? Explain. 6

8. (a) Explain the working of above-average algorithm. 7

(b) List and explain the major components of a load distributing algorithm. 6

9. (a) Write a short note on :

(i) Lost messages

(ii) Orphan messages

(iii) Domino effect. 6

(b) Give classification of system failures in distributed system. 7

10. (a) Explain the working of non-blocking commit protocol. 7

(b) Explain the concept of shadow pages used in recovery in distributed systems. 6