B.Tech Even Semester Examination, May, 2025

Computer Science & Engineering

(8th Semester)

Course No: CSE-801(17)

(Advanced Operating Systems)

Full Marks: 50
Pass Marks: 25
Time: 2 hours

Note:
1. Attempt any five questions.
2. Begin each answer in a new page
3. Answer parts of a question at a place
4. Assume reasonable data wherever required
5. The figure in the right margin indicates full marks for the question
6. All the mathematical symbols and abbreviations have their usual meanings.

1. (a) In terms of Deadlock, explain the Graph Reduction Method in detail. 6

   (b) Explain briefly: Deadlock avoidance and Deadlock Prevention. 4

2. (a) Explain the issues in distributed operating system in detail. 6

   (b) Compare and contrast 4

   (a) MONOLITHIC KERNEL STRUCTURE

   (b) COLLECTIVE KERNEL STRUCTURE

3. (a) Give the Schiper-Eggli-Sandoz Protocol for Causal ordering of events. Also explain the same. 6

   (b) What is a global state? And why is it so important in designing a distributed system. 4

4. Give the Maekawa's algorithm for distributed mutual exclusion along with its proof of correctness. Also explain how the situation of deadlock is handled in the same. 10

5. Give Raymond's Tree based algorithm for distributed mutual exclusion. Also give the proof of correctness for the same 10

6. (a) Briefly explain the control organization for distributed deadlock detection. 5

   (b) Explain the issues in distributed deadlock detection and resolution. 5

7. (a) Give Chandy-Misra-Haas's distributed deadlock detection algorithm for the AND request model to illustrate deadlock detection using edge-chasing. 8

   (b) Give types of distributed deadlock detection algorithms. 2

8. Write an elaborative note on Dolev et al.'s Algorithm explaining the Data structure used. Also give the alogithm. 6+4

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