Register Number | | | | | | | | | |

**Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110**

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Department of Computer Science and Engineering

**Continuous Assessment Test – II**

**Question Paper**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Degree & Branch** | BE & Computer Science and Engineering | | | | **Semester** | VII |
| **Subject Code & Name** | UCS1701- Distributed Systems | | | | **Regulation:** | **2018** |
| **Academic Year** | 2022-2023 ODD | **Batch** | 2019-2023 | **Date** | **14-10-2022** | **FN / ~~AN~~** |
| **Time: 08:15 – 09:45 AM (90 Minutes)** | **Answer All Questions** | | | | **Maximum: 50 Marks** | |

**Part – A (6×2 = 12 Marks)**

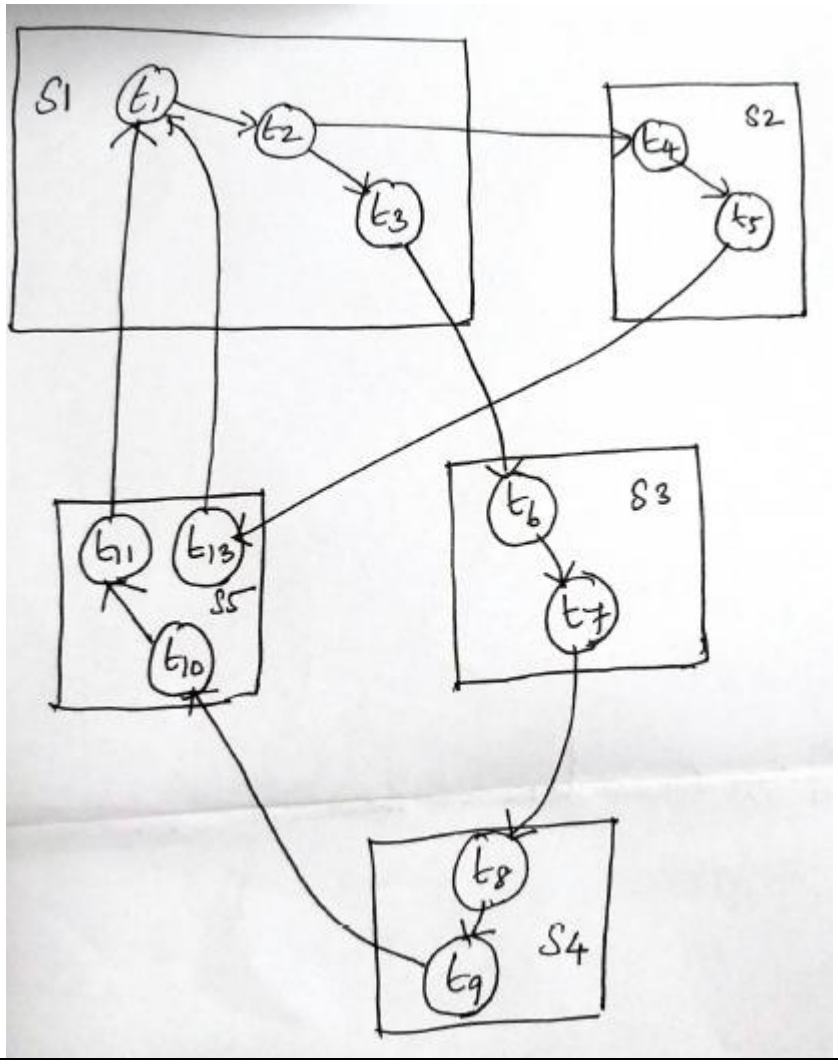
| | | |
|---|---|---|
| KL2 | 1. Explain any two performance parameters of distributed mutex exclusion. | CO3 |
| KL1 | 2. Define idle token. | CO3 |
| KL2 | 3. Outline the message complexity of two non-token-based D-MUTEX algorithms. | CO3 |
| KL2 | 4. Outline the difference between starvation and deadlocks. | CO3 |
| KL3 | 5. Identify the maximum number of malicious processes when the total number of processes is 12 for the Byzantine agreement problem in the synchronous environment. | CO4 |
| KL1 | 6. List any two applications of Byzantine consensus. | CO4 |

**Part – B (3×6 = 18 Marks)**

| | | |
|---|---|---|
| KL2 | 7. Illustrate the effect of Byzantine Consensus for Asynchronous non-malicious environment in which the source sends the commands as 1 → 0. | CO4 |
| KL3 | 8. Consider 4 cohorts and 1 source in synchronous environment. Apply Byzantine consensus for the following cases and illustrate the result.<br>i. Two of the cohorts are malicious.<br>ii. Only the source is malicious. | CO4 |
| KL2 | 9. Demonstrate the limitations of Path -Pushing algorithm with an example. | CO3 |

**Part – C (2×10 = 20 Marks)**

| | | |
|---|---|---|
| KL3 | 10. Apply the Lamport's non-token based distributed mutual exclusion algorithm for the scenario in which the order of request for critical section is as follows.<br>P1 → (P2 \|\| P3) → P4 | CO3 |
| | (OR) | |
| KL3 | 11. Apply the Ricart Agrawala's distributed mutual exclusion algorithm for the scenario in which the order of request for critical section is as follows.<br>P3 → (P1 \|\| P2) → P3 | CO3 |
| KL3 | 12. Apply the token based distributed mutual exclusion algorithm for the scenario in which the order of request for critical section is as follows.<br>P1 → P2 → (P3 \|\| P4)<br>*Note: Initially the token is held by process P3* | CO3 |

| | | |
|---|---|---|
| | (OR) | |
| KL3 | 13. Apply Edge chasing algorithm for the given scenario and identify the presence of deadlocks. Justify the fact "*Edge Chasing Algorithm will not identify any phantom deadloccks*".<br>  <br> | CO3 |

----------ALL THE BEST----------