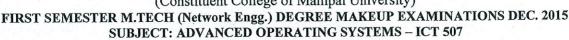


Reg. No.

(Constituent College of Manipal University)





TIME: 3 HOURS

प्रज्ञानं ब्रह्म

(REVISED CREDIT SYSTEM) 30/12/2015

MAX. MARKS: 50

Instructions to candidates

- Answer any FIVE FULL questions.
- Missing data, if any, may be suitably assumed.
- Consider a system with 4 processes (P₀ ... P₃) and 3 resource types (A(3) B(9) C(11)). The resource-allocation state at time to is given below. Is the system in a safe state? If yes, which sequence satisfies the safety criteria? If no, give reason. If the system is in a safe state, can the following request be granted, why or why not?
 - i) P0 requests (7, 4, 3)

Process	Allocation			Max			Available		
	A	В	C	A	В	C	A	В	C
P_0	0	1	0	7	5	3	3	3	2
\mathbf{P}_{1}	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

- Explain the readers-writers problem. Write the pseudocode to solve readers-writers problem 1B. using monitors.
- What are General or Counting semaphores? A counting semaphore was initialized to 10. Then six 1C. P (wait) operations and four V (signal) operations were completed on this semaphore. What is the resulting value of this semaphore?

[5+3+2]

- What do you mean by causal ordering of messages. Write the SES (Schiper-Eggli-Sandoz) 2A. algorithm for causal ordering of messages and explain.
- Describe the Suzuki Kasami's Broadcast algorithm for Distributed Mutual Exclusion. 2B.
- With illustrations, show that Lamport's clock has limitations? How is it overcome? 2C.

[5+3+2]

- Explain the Chandy-Misra-Haas algorithm for distributed deadlock detection. Trace the algorithm 3A. considering 3 sites and 10 nodes.
- What are the issues to be considered in the implementation of DSM. Discuss the Central-Server 3B. algorithm and the Migration algorithm to implement DSM systems.
- Show that in Lamport's algorithm the critical section is accessed according to the increasing order 3C. of timestamps.

[5+3+2]

- Describe the Above Average Symmetrically initiated Algorithm for Distributed Scheduling. 4A. Discuss the stability of this algorithm.
- Discuss how the following issues can be addressed in a Distributed File System. 4B.
 - Cache consistency
- Writing Policy ii)
- Availability

4C. Explain any four models of deadlocks.

- 5A. Write the synchronous checkpointing algorithm. What is the drawback of this algorithm? How is it overcome in Modified algorithm.
- 5B. Distinguish between forward error recovery and backward error recovery. Discuss the two approaches for backward error recovery.
- 5C. Discuss the various issues in Distributed Operating systems.

[5+3+2]

- 6A. Distinguish between load balancing and load sharing. Discuss in detail the various issues in Task Migration.
- 6B. Discuss the static voting algorithm.
- 6C. Explain the Basic timestamp ordering algorithm and Multiversion timestamp ordering algorithm.

[5+3+2]