Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

FIRST SEMESTER M.TECH (Network Engg.) DEGREE MAKEUP EXAMINATIONS DEC. 2015

SUBJECT: ADVANCED OPERATING SYSTEMS – ICT 507

(REVISED CREDIT SYSTEM)

TIME: 3 HOURS **30/12/2015** **MAX. MARKS: 50**

Instructions to candidates

- Answer any **FIVE FULL** questions.
- Missing data, if any, may be suitably assumed.

1A Consider a system with 4 processes (P_0 ... P_3) and 3 resource types (A(3) B(9) C(11)). The resource-allocation state at time t_0 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	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
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			

1B. Explain the readers–writers problem. Write the pseudocode to solve readers-writers problem using monitors.

1C. What are General or Counting semaphores? A counting semaphore was initialized to 10. Then six P (wait) operations and four V (signal) operations were completed on this semaphore. What is the resulting value of this semaphore?

[5+3+2]

2A. What do you mean by causal ordering of messages. Write the SES (Schiper-Eggli-Sandoz) algorithm for causal ordering of messages and explain.

2B. Describe the Suzuki Kasami's Broadcast algorithm for Distributed Mutual Exclusion.

2C. With illustrations, show that Lamport's clock has limitations? How is it overcome?

[5+3+2]

3A. Explain the Chandy-Misra-Haas algorithm for distributed deadlock detection. Trace the algorithm considering 3 sites and 10 nodes.

3B. What are the issues to be considered in the implementation of DSM. Discuss the Central-Server algorithm and the Migration algorithm to implement DSM systems.

3C. Show that in Lamport's algorithm the critical section is accessed according to the increasing order of timestamps.

[5+3+2]

4A. Describe the Above Average Symmetrically initiated Algorithm for Distributed Scheduling. Discuss the stability of this algorithm.

4B. Discuss how the following issues can be addressed in a Distributed File System.

i) Cache consistency ii) Writing Policy iii) Availability

4C. Explain any four models of deadlocks. [5+3+2]

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]