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MANIPAL INSTITUTE OF TECHNOLOGY
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FIFTH SEMESTER B.E. (CSE) DEGREE END SEMESTER EXAMINATION
NOV./DEC. 2011
OPERATING SYSTEMS AND LINUX (CSE 307)
DATE: 05-12-2011

TIME: 3 HOURS   MAX.MARKS: 50

Instruction to Candidates
- **Answer any 5 full questions.**

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1 a) Write the solution to bounded buffer problem using monitors. Buffers should be embedded within the monitor itself.

b) Give the general syntax of the monitor.

c) Define the two operations performed on the semaphore.

d) Describe physical and logical formatting of the disk.

(4+1+2+3)

2 a) With the help of a Gantt Chart (Use the data given below in Table 1) calculate Average Waiting Time and Average Turnaround time for a preemptive SJF scheduler.

Process	Arrival Time(msecs)	Burst Time(msecs)
P1	0	6
P2	2	4
P3	4	3
P4	5	1

(Table 1)

b) Write a short note on single level directory.

c) What is a file? Describe the different file attributes.

d) List out and explain the different criteria that have been suggested for comparing CPU scheduling algorithms.

(3+2+3+2)

3 a) With a neat diagram explain the procedure for handling page faults.

b) Explain the following terms:

      i) Prepaging

      ii) Thread Cancellation.

c) Differentiate between many-to-one and one-to-one multithreading model.

(4+4+2)

4 a) Explain the different variants of COPY rights in an access matrix.

b) Explain boot sector virus with a neat diagram.

c) On a simple paged system, associative registers hold the most active page entries and the full page table is stored in the main memory. If references satisfied by the associative registers take 90 ns, and reference through the main memory page table takes 220 ns, what is the effective access time if 60% of all memory references find their entries in associative registers.

d) What is forward-mapped page table? Explain with an example.

(2+3+2+3)

5 a) Resource type A has 12 instances, resource type B has 4 instances, and resource type C has 6 instances. Consider the following snapshot of the system given in Table 2. If process P3 makes a request of(2,1,0) will the system be safe . Show all the steps

	Allocation			Max		
	A	**B**	**C**	**A**	**B**	**C**
P$_O$	2	1	0	9	4	2
P$_1$	2	0	0	3	2	2
P$_2$	3	0	1	9	0	2
P$_3$	2	1	1	4	2	2
P$_4$	0	0	2	4	3	3

(Table 2)

b) Mention the three components for module support under LINUX. Explain.

c) List and explain the necessary conditions for deadlock to arise in a system.

(5+3+2)

6 a) Explain microkernel architecture used in operating system design. What are the benefits of microkernel.

b) With a neat Queuing diagram explain the various queues used in process scheduling.

c) Explain the following terms:

      i) Cache Coherency.

      ii) Multiprogramming

(3+3+4)