Reg No.										

MANIPAL INSTITUTE OF TECHNOLOGY
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MANIPAL-576104

FIFTH SEMESTER B.E.(CSE) MAKEUP EXAMINATION-JAN 2009

OPERATING SYSTEMS AND UNIX
(CSE-307)
(10 POINT CREDIT SYSTEM)

TIME DURATION: 3 HOUR MAX.MARKS: 50

Instructions to Candidates

- Answer **ANY FIVE** questions.

1 a) What is an operating system? "An operating system as a resource allocator" justify your answer?
b) Explain the virtual machine system model along with its benefits?
c) Describe the differences between among short-term and log-term Scheduling?
(3 + 4 + 3)

2 a) what is a thread? Explain the benefits of multithreaded programming?
b) Consider the following set of processes with a length of the CPU burst time given in milliseconds.

Process	Arrival Time	Burst Time	Priority
P1	0	7	3
P2	3	2	2
P3	4	3	1
P4	4	1	1
P5	5	3	3

Draw Charts illustrating the execution of these processes using SRTF and Preemptive Priority. Find out which of them provides results in the minimal average turnaround time and waiting time. Show all the steps.
c) What is meant by race condition of concurrent access? Explain with an example?
(3 + 4 + 3)

3 a) Discuss the problems with the semaphore? Give the solution to the Dining-Philosophers problem using Monitors?
b) What is a resource allocation graph? Discuss the issues related with recovery from deadlock?

c) Given a system with total resources of A(3); B(14); and C(12), and the following snapshot : calculate the need matrix and check the system for deadlock using Banker's algorithm. Show all the steps.

Process	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
P0	0	0	1	0	0	1	1	5	2
P1	1	0	0	1	7	5			
P2	1	3	5	2	3	5			
P3	0	6	3	0	6	5			
P4	0	0	1	0	6	5			

(3 + 3 + 4)

4 a) With the help of a diagram explain the hardware support required for paging. What is the effective access time of paged memory?

b) Explain the segmented memory management with an example?

c) Consider the page reference stream 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for FIFO and LRU algorithms, assuming 4 frames? Find out which one of the most efficient. Show all the steps. (3 + 3 + 4)

5 a) What is a file? What are the different types of file types? Give their functions with an example for each?

b) Suppose the head of moving disk with 200 tracks numbered 0-199. Suppose the current request being serviced is for track 50 and the previous request serviced was for track 45.
Queue = 50, 45, 180, 35, 150, 5, 145, 51, 54.
What is the total number of head movements needed to satisfy these requests using the SSTF algorithm and also show the head movement. Show all the steps.

c) What is principle of least privilege and need to know? Explain the protection using access matrix with an example? (3 + 4 +3)

6 a) What is an intruder and cracker? Differentiate between VIRUS and WORM?

b) Describe the levels of security measures for to protect a system?

c) Explain the synchronization in Linux? (4 + 3 + 3)