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MANIPAL INSTITUTE OF TECHNOLOGY
(A Constituent Institute of Manipal University)
MANIPAL-576104



V SEMESTER B.TECH (CSE)-MAKE UP EXAMINATION
09-01-2014
SUBJECT: OPERATING SYSTEMS AND LINUX (CSE 309)

TIME: 3 HOUR

MAX.MARKS: 50

Instruction to Candidates

- **Answer any 5 full questions.**
- **Show all calculations with proper steps wherever needed.**

- 1 a) Explain with a neat diagram the different components of the Linux system.
- b) With the help of a Gantt Chart (Use the data given below in Table 1) calculate Average waiting Time and Average turn around time for a preemptive priority scheduler. Show waiting time and turn around time for each job with proper calculations.

(Table 1)

Process	Burst Time(in ms)	Arrival Time (in ms)	Priority
P1	12	0	2
P2	10	0	1
P3	4	1	0
P4	10	4	2
P5	12	2	1

- c) List out the parameters used to define the multilevel feedback queue scheduler. (4+4+2)

- 2 a) Explain the different information associated with an open file.

b) 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 the references satisfied by associative registers take 100 ns and references through the main memory page table take 180 ns, What must the hit ratio be to achieve an effective access time of 125ns.

c) What is segmentation? With a neat diagram explain the segmentation hardware used in address translation.

d) With a neat diagram explain single-level directory structure. (2+2+4+2)

3 a) What is a thread library? Explain the various multithreading models

b) Write a C code to implement the wait() and signal() operations performed on semaphore which does not require busy waiting.

c) Write a deadlock free solution to the dining philosophers problem using monitors. (4+3+3)

4 a) Resource type A has 12 instances, resource type B has 4 instances, and resource type C has 6 instances. Consider the 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 necessary steps

(Table 2)

	Allocation			Max		
	A	B	C	A	B	C
P ₀	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

b) Explain briefly the difference between virus and worms.

c) Explain the different variants of COPY rights in an access matrix. (5+2+3)

5 a) Compare the various interprocess communication models.

b) Explain the procedure for handling page fault with a neat diagram.

c) Explain the following terms

i) Task control Block.

ii) Prepaging (2+4+4)

6 a) What is sector sparing. Explain with an example.

b) Why do application programmers prefer programming according to an API rather than invoking the actual system call?

c) Explain the following terms

i) Cache Coherency

ii) Job Scheduling

iii) System Call Interface

iv) Multiprogramming

v) Dispatcher. (3+2+5)

*****BEST OF LUCK*****