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08SCS11

First Semester M.Tech. Degree Examination, Dec.08/Jan.09
Operating Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions***

1 a. Explain the various views by which an operating systems role can be understood. **(05 Marks)**

b. Why is dual-mode operation in operating systems necessary? Explain the transition between the two modes. **(05 Marks)**

c. Differentiate between system calls and system programs. **(04 Marks)**

d. What are virtual machines? Explain its advantages and disadvantages. **(06 Marks)**

2 a. What is a process? Explain the various components of a process control block. **(04 Marks)**

b. Differentiate between long-term, short-term and medium-term schedulers. **(04 Marks)**

c. What are multithreaded processes? Briefly mention its benefits. **(04 Marks)**

d. Consider the following set of processes with length of CPU burst times given in milliseconds:

Process	Burst time	Priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

Processes arrive in order P_1, P_2, P_3, P_4 and P_5 all at time 0. Draw gantt charts to illustrate execution and find average Tumaround time for each of the scheduling algorithms FCFS, SJF, Round Robin (q = 1) and non-preemptive priority algorithm. **(08 Marks)**

3 a. Describe the critical section problem. Explain the two approaches used to handle critical section problem in operating systems. **(04 Marks)**

b. Describe the solution of mutual exclusion with an algorithm for a typical reader-writers problem. **(06 Marks)**

c. With an example, explain how deadlock can be avoided using Banker's algorithm. **(10 Marks)**

4 a. What is address binding? Explain the concept of dynamic relocation of addresses. **(08 Marks)**

b. Define external fragmentation. What are its causes and how is it overcome? **(04 Marks)**

c. What is paging? With help of a block diagram of paging hardware, explain its concept. **(08 Marks)**

5 a. Describe the concept of demand paging. **(08 Marks)**

b. What is trashing? Explain how it is overcome. **(06 Marks)**

c. Consider the following sequence of memory references from a 460 word program:
10, 11, 104, 170, 73, 309, 185, 245, 246, 434, 458, 364.

i) Show the reference string assuming page size of 100 words.

ii) Find the page fault rate for the above reference string assuming 200 words of primary memory available and FIFO and LRU replacement algorithms. **(06 Marks)**

6 a. Describe the various file access methods. **(06 Marks)**

b. Explain the file system mounting operation. **(06 Marks)**

c. Briefly describe the structure and operations used to implement file system operations. **(08 Marks)**

7 a. With an example, explain the various disk scheduling algorithms. **(08 Marks)**

b. Explain the disk management activities of disk formatting in detail. **(04 Marks)**

c. Explain the access matrix structure employed as a protection domain model. **(08 Marks)**

8 a. Explain the process management model of LINUX operating system. **(10 Marks)**

b. What are the two file system models adopted in LINUX operating system? Explain both in detail. **(10 Marks)**

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