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07MCA35

Third Semester MCA Degree Examination, December 2010 Operating Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1
 - a. Describe the various services provided by the operating system. (06 Marks)
 - b. Explain the layered architecture of the operating system. (04 Marks)
 - c. Discuss the different operating systems given below:
 i) Multiprocessor system ii) Time sharing system iii) Clustered system iv) Real time system. (10 Marks)

- 2
 - a. What is a process control block(PCB)? Describe the contents of PCB. (06 Marks)
 - b. Discuss the different types of CPU schedules. (06 Marks)
 - c. Explain the various multithreading models. (08 Marks)

- 3
 - a. What is a critical section? What are the three requirements to solve the critical section problem? (06 Marks)
 - b. Explain the multilevel queue scheduling and multilevel feedback queue scheduling. (06 Marks)
 - c. Consider the following set of processes with length of CPU burst given in milliseconds:

Process	P ₁	P ₂	P ₃	P ₄	P ₅
Burst time	8	2	2	3	5
Priority	4	1	3	3	2

 All processes arrived at time 0 in the given order. Draw Gantt chart using FCFS SJF (non-preemptive) priority and round robin (quantum 2) smallest number implies higher priority. Find the average waiting time for each process for each scheduling algorithm. (08 Marks)

- 4
 - a. What are the necessary conditions for a deadlock? (04 Marks)
 - b. What is a semaphore? Give the pseudocode for wait(s) and signal(s). (04 Marks)
 - c. What are the data structures, used in the bankers algorithm? Write an algorithm to know whether the system is in a safe state or not. (08 Marks)
 - d. With an example explain resource allocation graph. (04 Marks)

- 5
 - a. With respect to memory management, explain i) First fit, ii) best fit and iii) worst fit algorithms. (06 Marks)
 - b. What is a page fault? What actions does operating system take when a page fault occurs? (08 Marks)
 - c. Explain the FIFO page replacement algorithm, with an example. (06 Marks)

- 6
 - a. What are the different attributes of a file? (04 Marks)
 - b. Explain the file allocation methods, with their merits and demerits. (12 Marks)
 - c. Describe the single level directory system. (04 Marks)

- 7
 - a. Consider a disk queue with request for I/O to blocks on cylinders 98, 183, 37, 122, 14, 124, 65, 67 in that order. If the disk head is initially at cylinder 53 find the number of head movements using the following algorithms: i) FCFS ii) SSTF. (10 Marks)
 - b. What is access matrix? Discuss the implementation of access matrix. (10 Marks)

- 8
 - a. Discuss the components of a Linux operating system. (10 Marks)
 - b. Explain the interprocess communication in the Linux system. (06 Marks)
 - c. Describe the fork() and exec() process model in the Linux operating system. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

