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10MCA35

**Third Semester MCA Degree Examination, December 2012**  
**Operating Systems**

Time: 3 hrs.

Max. Marks:100

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

1. a. Discuss the necessities of an operating system with respect to user and system view. (04 Marks)  
 b. Multiprogramming leads to efficient utilization of resources. Justify. (05 Marks)  
 c. How do you differentiate between the following:  
 i) Real time      ii) Distributed system      iii) Clustered systems. (06 Marks)  
 d. Give the difference between multiprogramming and multiprocessing systems. (05 Marks)
2. a. Why a process control block required in operating system? Discuss in detail. (06 Marks)  
 b. What is a scheduler? Discuss the need for it in operating system with different types of schedulers. (06 Marks)  
 c. How does computer systems provides hardware support to differentiate various modes of execution? (04 Marks)  
 d. Mention the activities connected with process management and memory management. (04 Marks)

3. a. Consider the following processes, which have arrived at the ready queue with the burst time and the arrival time given in milli second as shown.

Process	Burst time in ms	Arrival time in ms
P <sub>1</sub>	8	0
P <sub>4</sub>	5	3
P <sub>2</sub>	4	1
P <sub>3</sub>	9	2

Construct the Gantt chart and calculate the average waiting time using the following algorithms:

- i) SJF (pre emptio)      ii) FCFS (10 Marks)
- b. Brief the multilevel queue scheduling concept with neat sketch. (05 Marks)
- c. What are the scheduling criteria that can be used for comparison that can make a substantial difference in judging which algorithm to be best? (05 Marks)
4. a. Discuss the necessary conditions for a deadlock to occur in a system with example. (06 Marks)  
 b. What is a critical section in an operating system? Mention the requirements to solve critical section problem. (06 Marks)  
 c. Explain the semaphore solution for reader writer's problem. (06 Marks)  
 d. Give the syntax of wait ( ) and signal ( ) operations. (02 Marks)
5. a. What is fragmentation? Define it's types with example. (06 Marks)  
 b. Brief first fit, best fit, worst fit concepts with an example. (06 Marks)  
 c. Using the reference string: 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1 with three frames available. Calculate the page faults using,  
 i) FIFO      ii) Optimal (08 Marks)

- 6** a. What is contiguous allocation, indexed allocation, linked allocation in a file system? Discuss in detail with a neat diagram. (12 Marks)
- b. Briefly write the different file attributes. (04 Marks)
- c. Mention the different operations in a file system. (04 Marks)
- 7** a. Using the disk queue with requests for blocks on cylinder: 98, 183, 37, 122, 14, 124, 65, 67 in the order. Assuming initial disk head position at cylinder 14. Find the number of head movements using the following : i) FCFS ii) SSTF iii) SCAN and compare the results. (12 Marks)
- b. What is an access matrix? Discuss the necessities of access matrix, with implementation concept and neat diagram. (08 Marks)
- 8** a. What are the components of LINUX operating system? (05 Marks)
- b. What is meant by denial of service? (05 Marks)
- c. Brief the different thread models with a neat diagram. (06 Marks)
- d. What are the advantages of Interprocess communication? (04 Marks)

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