MCA 3rd Semester Examination
Jan. 2014
Principals of Operating System
Subject Code: CAL-601

Time Allowed: 03 hours.  Maximum Marks: 100

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: Question No. 1 is Compulsory and attempt two questions from each section. All questions carry equal marks.

1. Explain the following terms
   a. Dispatcher
   b. Buffering
   c. PCB
   d. Batch OS

SECTION-A

2. What is operating system? Explain different types of operating systems in detail. (20)

3(a) Explain process life cycle with suitable diagram. (10)

(b) Consider the set of processes <p1, p2, p3, p4, p5> with the length of the cpu burst <10, 1, 2, 1, 5> and they arrive in the same order at time 0. Find out the turn around and waiting time for each process using FCFS and SJF. (10)

4(a) Consider the following page reference string:
   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 the LRU and FIFO replacement algorithms, assuming four frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each. (10)

(b) Explain the concept of virtual memory and how it is obtained by segmentation? (10)

SECTION-B

5(a) Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk scheduling algorithms?
   a. SSTF
   b. SCAN

(b) Explain any two file allocation methods. (10)

6(a) What is deadlock? Explain necessary conditions for a deadlock. Differentiate between deadlock prevention and deadlock avoidance. (10)

(b) Explain the methods of deadlock avoidance. (10)

7. (a) Explain device controller in detail. (10)

(b) Explain interrupt – driven I/O cycle. (10)