MCA (Revised)

Term-End Examination

June, 2008

MCS-041 : OPERATING SYSTEMS

Time : 3 hours *Maximum Marks : 100*

(Weightage 75%)

Note : *Question number 1 is* ***compulsory****. Attempt any* ***three*** *questions from the rest.*

1. (a) Consider the following set of processes, with the length of the CPU burst time given in milliseconds :

Process	*Burst Time*
P1	11
P2	28
P3	04
P4	06
P5	14

All five processes arrive at time 0, in the order given. Draw Gantt charts illustrating the execution of the processes using FCFS, SJF and Round Robin (quantum = 2) scheduling. What is the turnaround time of each process for each of the scheduling algorithms ? Also find average waiting time with each algorithm. *10*

(b) Write and explain the Bakery's algorithm to handle the critical section problem for 'n' processes. *10*

(c) Explain the hardware support for paging. Briefly explain the three page address translation technique. *10*

(d) Explain the Bell and LaPadula Model. Also explain the five components of Information Flow Model. 10

2. (a) Explain any five design goals of distributed systems in brief. 8

(b) How is Distributed Operating System different from Network Operating System ? Explain. 7

(c) Characterize a Deadlock. Explain how deadlock can be prevented. 5

3. (a) Mention the advantages and limitations of Multi-user Operating Systems. 5

(b) What is meant by Context Switch ? Explain the overhead incurred due to context switching on process and thread. 5

(c) Explain the two non-contiguous disk storage allocation schemes with the help of an illustration for each. 10

4. (a) Explain the structure of UNIX operating system and its components in brief. 10

(b) The following is the sequence of page requests :

1, 3, 5, 2, 4, 1, 2, 3, 4, 4, 5, 3, 2, 2, 1.

Assume that there are three frames. How many page faults will occur with LRU, FIFO and OPT algorithms ? 10

5. (a) How many types of multiprocessor operating systems are there ? Explain them in brief. 10

(b) Explain the following in brief : 10

(i) Remote Procedure Call (RPC)

(ii) Thrashing

(iii) Segmentation

(iv) Authentication