MCA (Revised)

Term-End Examination

December, 2007

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) Explain Lamport's algorithm for ordering of events in a distributed environment with an example. *10*

(b) For a given 5 processes arriving at time 0, in the order with the length of CPU time in milliseconds

Process	*Processing Time*
P1	10
P2	29
P3	03
P4	07

obtain average waiting time using FCFS, SJF and RR (Quantum = 2) scheduling algorithms for the above set of processes. Which algorithm will give the minimum average waiting time ? *10*

(c) Give solution to Dining Philosophers problem using monitors. *10*

(d) Explain Real Time Operating System (RTOS). Give any two example applications suitable for RTOS. Differentiate RTOS with respect to Time-sharing systems. 10

2. (a) Explain Resource Allocation graph for single and multiple instances, with an example. Also explain the concept of deadlock detection and recovery. 10

(b) Explain the concept of segmentation with the help of a suitable diagram. Make a relative comparison between paging and segmentation. 10

3. (a) Explain the features of UNIX OS. Compare its features with Windows operating system. 10

(b) Explain Bell and La-Padula Model for security and protection. Also explain the role of access lists in security. 10

4. (a) Briefly explain the types of multiprocessor operating systems. How are the (i) test and set (ii) fetch and add instructions used in synchronization ? 10

(b) Explain RPC. How is RPC implemented ? What happens in Remote Object Invocation ? 10

5. (a) Explain any two disk scheduling algorithms. Calculate the total head movement with the two disk scheduling algorithms, you explained, for the following blocks : 10

50, 91, 150, 92, 130, 18, 140, 70, 60

Assume initially the head is on block no. 43. Draw the diagrams also.

(b) List the contents of PCB. What will be the contents if a Thread Control Block is to be created ? Explain. 10