11297

MCA (Revised)

Term-End Examination

December, 2010

MCS-041 : OPERATING SYSTEMS

Time : 3 hours *Maximum Marks : 100*

(Weightage 75%)

Note : *Question No. 1 is* ***compulsory****. Attempt* ***any three*** *questions from the rest.*

1. (a) What is a semaphore ? Give solution to producer-consumer problem using semaphores, explain the solution. **10**

   (b) Explain Pipes and Filters in Unix Operating System. **4**

   (c) Explain the concept of virtual memory in OS. **4**

   (d) Calculate the average waiting time, average turn around time for the processes given for the following scheduling algorithms : **10**

   (i) SJF

   (ii) FCFS

   (iii) RR (quantum = 2)

The list of processes is given as :

Process	Arrival time	Process time
P1	0	2
P2	1	1
P3	3	3
P4	5	2

(e) What are the essential conditions for deadlock to occur ? Explain with an example. Explain deadlock avoidance algorithm with an example. 8

(f) Differentiate between a distributed and Network operating system with key features. 4

2. (a) How can we achieve ordering of events in a distributed OS ? Suggest an algorithim and implement an example on it. 8

(b) Explain the concept of critical section. What is mutual exclusion and how does it solve the problems of a critical section ? Explain Dekker's algorithm for mutual exclusion. 8

(c) Differentiate between various types of security models of an operating system. 4

3. (a) What do you mean by disk scheduling algorithm ? Calculate the total head movement with SSTF and C-SCAN scheduling algorithms for the following block sequence : **10**

91, 150, 42, 130, 18, 70, 60, 128.

Initially the head is at cylinder numbered 0. Draw suitable diagrams for all.

(b) Explain the hardware support for segmentation with an example. **5**

(c) Explain (with diagram) the WINDOWS 2000 OS structure. **5**

4. (a) How can we ensure authentication in a distributed and Network Operating System ? Suggest two techniques of authentication. **6**

(b) Explain the token based mutual exclusion for distributed Operating System. **6**

(c) For the page string (Reference string) as : **8**

0, 1, 2, 3, 6, 10, 13, 4, 6, 2, 0 and with 3 memory frames, calculate number of page faults using OPT and FCFS page replacement algorithms.

5. (a) Give short notes on : 4x4=16

(i) Fault tolerance in Distributed OS.

(ii) UNIX structure.

(iii) A cyclic graph directory.

(iv) PCB/TCB.

(b) Compare file management in UNIX with WINDOWS. Give diagrams in support of the answer. 4