ADCA / MCA (III Year)

Term-End Examination

December, 2007

CS-13 : OPERATING SYSTEMS

Time : 3 hours   Maximum Marks : 75

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

1. (a) Define deadlock with example. List the four necessary conditions for the deadlock occurrence. Also explain deadlock prevention methods.   8

    (b) Describe Belady's anomaly with an example. Does it occur in all page replacement algorithms ?   7

    (c) Explain Producers/Consumers problem in concurrent programming, with an example.   5

    (d) Define the terms mutual exclusion and semaphores with examples.   5

    (e) What is thrashing ? Explain its causes. Give examples.   5

(b) If memory access time is 250 nsec; search time in TLB is 25 nsec; hit ratio is 80%; calculate effective memory access time. 3

(c) Write the types of multiprocessor OS. 5

3. (a) For the following processes and CPU burst time

(**Note** : All the processes arrived at the same time)

Processes	Burst time
P1	1
P2	4
P3	3
P4	2

(i) Draw Gantt charts showing the execution of processes for

(a) SJF

(b) Round Robin Scheduling (quantum = 1)

(ii) Calculate the waiting time and turnaround time of each process for above scheduling algorithms. 6

(b) Explain Dekker's solution to mutual exclusion problem, with an example. 6

(c) Explain Access-matrix model for protection, with an example. 3

4. (a) Explain the concept of paged segmentation. What are its overheads ? 5

(b) List and explain the disk allocation methods in an operating system. 5

(c)   Explain take-grant model for protection of a system.   *5*

5.   (a)   List the similarity and differences between multiprocessor and distributed systems.   *5*

(b)   Explain the concept of working set model with an example.   *5*

(c)   Explain single-stage and multi-stage interconnection networks with examples.   *5*