ADCA / MCA (III Year)

Term-End Examination

June, 2008

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) Explain the difference and relationship between a program and a process. Is this difference important in serial OS ? Why or why not ? 6

   (b) Explain Readers – Writers problem in concurrent programing and provide solution using semaphore. Write the complete algorithm. 8

   (c) Discuss a detailed step-by-step comparison of Lamport's and Ricart-Agrawala's algorithm for mutual exclusion. 8

   (d) Write an algorithm for deadlock detection. Illustrate with an example. 8

2. (a) Define the term program relocatability. Write the differences between the static relocation and dynamic relocation schemes. 7

   (b) Explain the access-control matrix and take-grant model of protection system based on discretionary access control. 8

3. (a) Write an algorithm that solves the producer/consumer problem with a bounded buffer. How is it different from the unbounded buffer algorithm ? Explain. 9

   (b) Discuss the common failures in distributed system. 6

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

Process	Burst time
P_1	10
P_2	20
P_3	4
P_4	8
P_5	14

   All five processes arrive at time 0, in the order given. Draw Gantt chart illustrating the execution of process using FCFS, SJF and RR (quantum = 2) scheduling. What is the turnaround time of each process for each of the scheduling algorithms ? Also find the average waiting time with each algorithm. 9

   (b) Describe the function of a Translation Lookaside Buffer (TLB) in a paging system and discuss the issues and operations involved in TLB Management in OS. Also indicate which of these operations are time critical. 6

5. (a) Discuss the Data Encryption Standard (DES) algorithm. What are its limitations ? 5

   (b) Discuss the contiguous and non-contiguous disk allocation schemes. 10