03296

ADCA / MCA (III YEAR)

Term-End Examination

June, 2011

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) Write and explain Ricart and Agrawala's algorithm for the ordering of events in distributed systems. Justify that this is a more efficient version of Lamport's algorithm. **8**

   (b) List and explain any two basic strategies of non - contiguous allocation of disk space. **7**

   (c) Define the term Process. List and explain the different states of a process. Also draw the process - state transition diagram. **8**

   (d) Explain how interprocess communication is employed using distributed shared memory in distributed systems. **7**

2. (a) What are Base limit registers ? Also explain a memory management scheme which can reduce the extent of external fragmentation with the help of a diagram. 9

(b) Explain any four security threats perceived by users and providers of computer based systems. 6

3. (a) Show how a monitor can be implemented with semaphores. 8

(b) Explain Dekker's solution to mutual exclusion problem, with an example. 7

4. (a) Compare and contrast Bell - La Padula model and Lattice model of information flow. 6

(b) Consider the following set of processes, with the length of the CPU burst time given in milliseconds : 9

Process	Burst Time
P_1	8
P_2	18
P_3	7
P_4	5
P_5	12

All five processes arrive at time O, in the order given. Draw Gantt charts illustrating the execution of the processes using FCFS, SJF and RR (quantum=1) scheduling.

What is the turn around time of each process for each of the scheduling algorithms ? Also find the average waiting time for each algorithm.

5. (a) Write Bankers algorithms for Dead - lock detection and protection. 7

(b) What is capability based system ? Explain, how capability list of process is implemented using capability based addressing with a suitable diagram. 8