



Seventh Semester B.E. Degree Examination, Dec.09/Jan.10

Operating Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Define the essential properties of any four of the following types of operating systems :

i) Mainframe system	iii) Clustered	v) Desktop system	
ii) Distributed system	iv) Handheld system	vi) Real time system.	(10 Marks)
- b. Explain the various computing environments. (06 Marks)
- c. List out the various services provided by the operating system. (04 Marks)
- 2 a. What is process? Draw and explain the process the state diagram. (08 Marks)
- b. Discuss the operations of process creation and process termination. (08 Marks)
- c. What are the merits and demerits of each of the following : (04 Marks)
 - i) Direct and indirect communication
 - ii) Symmetric and asymmetric communication.
- 3 a. Consider the following set of processes, with the length of CPU burst time, given in milliseconds.

Process	Burst time	Priority
P ₁	10	3
P ₂	1	1
P ₃	2	3
P ₄	1	4
P ₅	5	2

The processes are arrived in the order P₁, P₂, P₃, P₄, P₅ all at time 0.

- i) Draw the charts illustrating the execution of these processes using FCFS, SJF, a non preemptive priority (small priority number implies a higher priority and RR (quantum = 1) scheduling.
- ii) What is the waiting time of each process for each of the scheduling algorithms in part (i). (14 Marks)
- b. What are the differences between user level threads and Kernel level threads? (06 Marks)
- 4 a. Discuss the classical problems of synchronization. (08 Marks)
- b. What are the necessary conditions for the occurrence of deadlock? (08 Marks)
- c. What are the ways of recovering the system from deadlock? (04 Marks)

PART – B

- 5 a. Discuss the issues of memory protection. (05 Marks)
- b. Describe the following allocation algorithms :i) first fit ii) best fit iii) worst fit. (09 Marks)
- c. Memory partitions of 100 KB, 500 KB, 200 KB, 300 KB and 600 KB (in order) are available. How would first fit, best fit and worst fit place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)? (06 Marks)
- 6 a. Consider the following page reference stream 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. How many page faults would occur for LRU, FIFO and optimal replacement algorithms assuming 3 frames? Which one of the above is more efficient? (14 Marks)
- b. Differentiate between internal and external fragmentation. How are they overcome? (06 Marks)
- 7 a. What is a file? Describe the different access methods on files. (06 Marks)
- b. Draw a neat diagram and explain, linked allocation of disk space. (08 Marks)
- c. Explain the access matrix model of implementing protection in operating system. (06 Marks)
- 8 Write short notes on :

a. Distributed system topology	c. Virtual memory
b. Network types	d. Multithreading models. (20 Marks)

* * * * *