

Code: CS5T1, EM5T4

III B.Tech - I Semester – Regular Examinations - November 2014

OPERATING SYSTEMS
(Common for CSE & ECM)

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) What are the system components of an operating system, explain them? 7 M

b) Briefly discuss Time shared OS, Multiprocessor OS, and Distributed OS? 7 M

2. a) How do system calls differ from ordinary library routines, as both are supplied by the language? 7 M

b) Why it is important for a scheduler to distinguish between I/O-bound programs from CPU-bound programs? 7 M

3. The following Snapshot is given

Process	Arrival Time (ms)	CPU Burst Time (ms)
P1	0	10
P2	1	29
P3	2	3
P4	3	7

Draw the Gantt chart and calculate the turnaround time and waiting time of the jobs for FCFS (First Come First Served), SJF (Shortest Job First), SRTF (Shortest Remaining Time First) and RR (Round Robin with time quantum 10) scheduling algorithms. Arrival Time is only applicable to SRTF algorithm. 14 M

4. What do you mean by critical section problem? Using semaphores, write a solution to readers and writers problem that gives priority to readers. 14 M
5. a) System is in an unsafe state. Is it possible for the processes to complete their execution without entering deadlock? If yes, show how? 7 M
- b) What are the conditions necessary for the deadlock to occur? Is it possible that deadlock can occur if one process is running only? Justify. 7 M
6. a) Given memory partitions of 100k, 500k, 200k, 300k, and 600k (in order), apply first fit and best fit algorithms to place processes with the space requirement of 212k, 417k, 112k and 426k (in order)? Which algorithm makes the most effective use of memory? 10 M
- b) With a neat diagram discuss the concept of paging in brief? 4 M

7. In a paged segmented system, a virtual address consists of 32 bits of which 12 bits are a displacement, 11 bits are a segment number and 9 bits are a page number. Calculate
- (i) page size
 - (ii) maximum segment size
 - (iii) maximum number of pages
 - (iv) maximum number of segments 14 M
8. a) Calculate the number of disk accesses needed to read 20 consecutive logical blocks of a file in a system with
- (i) contiguous allocation
 - (ii) linked allocation
 - (iii) indexed allocation 9 M
- b) Write a brief notes on File system structure? 5 M