

Code: CSCS1T5

**I M.Tech - I Semester - Regular Examinations - April 2015**

**OPERATING SYSTEMS  
(COMPUTER SCIENCE & ENGINEERING)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

- 1 a) What are the three main purposes of an operating system? 7 M  
b) What is the difference between pre-emptive and non pre-emptive scheduling and explain with an example? 7 M
- 2 a) What are the major activities of an operating system in regard to process management? 7 M  
b) What is a Thread? What are the differences between user-level threads and kernel-level threads? 7 M
- 3 a) What is a semaphore? What is the difference between semaphore and Mutex? 7 M  
b) Implement a monitor to perform transactions on a bank account. 7 M
- 4 a) Explain Banker's algorithm. 7 M  
b) What is deadlock? What are the methods for handling Deadlocks? 7 M

5 a) Least recently used (LRU) page replacement policy is a practical approximation to Optimal page replacement policy. For the given reference string, how many more page faults will occur with LRU than with the optimal page replacement policy. 1,2,1,3,7,4,5,6,3,1. 10 M

b) What is segmentation? Explain the basic method used for segmentation. 4 M

6 a) Consider the following set of processes, with the length of CPU burst time given in milliseconds. Calculate the average waiting and turnaround times using Round Robin scheduling algorithm (Time Quantum =1). 7 M

Process	Burst Time
P1	10
P2	1
P3	2
P4	1
P5	5

b) Describe priority Scheduling algorithm. 7 M

7 a) What are the different file allocation methods? Explain the merits and demerits of each. 7 M

b) Describe three circumstances under which blocking I/O should be used. Describe three circumstances under which nonblocking I/O should be used. Why not just implement nonblocking I/O and have processes busy-wait until their device is ready? 7 M

8) Write short notes on the following:

14 M

a) Trojan horses

b) Buffer overflow

c) Trap door

d) Design principles of security