

BTC/BTI/UCS-306

Roll No.

**B. TECH (CSE, IT), B. TECH (CSE) + MBA
DUAL DEGREE & B. TECH (CSE) – EVENING**

**THIRD SEMESTER END TERM EXAMINATION :
NOVEMBER, 2013**

OPERATING SYSTEM

Time : 3 Hrs.

Maximum Marks : 70

Note: *Attempt questions from all sections as directed.*

SECTION – A (30 Marks)

Attempt any 5 questions.

Each question carries 6 marks.

1. (a) Enumerate the basic functions of Operating System and each in brief.
(b) Write short notes on Time Sharing System and Real-Time System.
2. Define the following terms :
 - (i) Dispatch Latency
 - (ii) Swapping
 - (iii) Context Switching

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3. (a) Draw the process states diagram and describe the various state of a diagram.

(b) Explain the security and protection provisions implemented in UNIX operating system.
4. What is the purpose of system calls, and how do system calls relate to the OS and to the concept of dual-mode (kernel mode and user mode) operation.
5. Explain the short-term, medium-term and long-term scheduling. Describe the differences among them.
6. Compare paging with segmentation with respect to the amount of memory required by the address translation structures in order to convert virtual addresses to physical address.

SECTION - B (20 Marks)

Attempt any two questions.

Each question carries 10 marks.

7. Consider the set of process given in table and the following scheduling algorithms :

(i) FCFS

(ii) Round Robin (Time Quanta=2)

Process ID	Arrival Time	Execution Time
P1	0.0	4.0
P2	2.0	7.0
P3	3.0	3.0
P4	3.5	3.0
P5	4.0	5.0

If there is a tie with in the process, the tie is broken in the favour of the oldest process.

- (i) Find the Average waiting time and response time for which the algorithms. Comment your results which one is better and why?
 - (ii) If the scheduler takes 0.2 unit of the CPU time in context switch for the completed job and 0.1 unit of additional CPU time for incomplete jobs for saving their context calculate the percentage of CPU time wasted in each case.
8. Give the principles, which should be followed by any solution designed to achieve Mutual Exclusion, Progress Requirement and Bounded Waiting in critical section problem.
 9. If FIFO page replacement is used with four page-frames and eight pages, how many page fault will

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occur with the reference string 0172327103 if four frames are initially empty? Repeat this problem with LRU and compare the Hit and Miss Ratio.

SECTION - C (20 Marks)
(Compulsory)

10. (a) Consider a System consisting of "m" resources of the same type being shared by n process. A process can request or release only one resource at time. Show that system is deadlock free if the following two condition hold :
- (i) The maximum need of each process is between one resource and m resources. (5)
 - (ii) The sum of all maximum needs is less than $m+n$. (5)
- (b) Explain shortest-seek-time-first (SSTF) Disk Scheduling. Why SSTF Scheduling tends to favours middle cylinders over the inner most and outer most cylinders? (5)
- (c) Discuss the influence of non-contiguous allocation of disk space on the feasibility and effectiveness of the fundamental of file organizations. (5)
