

Roll No. ....

**24252**

**B. Tech. (5th Semester) (Information  
Technology) Examination  
– December, 2011**

**PRINCIPLES OF OPERATING SYSTEM**

**Paper : CSE-301-F**

Time : Three hours ]

[ Maximum Marks : 100

*Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note : Attempt five questions with atleast one question from each Section and Question No. 1 is compulsory.*

1. (a) Explain the features of real time operating system.  $4 \times 5 = 20$
- (b) What are the activities of an operating system in regard to file management ?
- (c) Differentiate segmented paging and paged segmentation addressing schemes.
- (d) What is a semaphore ?

(e) What is thrashing ? How can this be eliminated ?

### SECTION – A

2. (a) Briefly explain OS services 10  
(b) Compare and contrast multi programming and time sharing operating system. 10
3. (a) Suppose that the following processes arrive for execution at the time indicated : 10

Process	Arrival Time	Burst Time
P <sub>1</sub>	0	8
P <sub>2</sub>	1	4
P <sub>3</sub>	2	9
P <sub>4</sub>	3	5

What is the average waiting and twinaround times for these processes with :

- (i) FCFS scheduling algorithm.  
(ii) Preemptive SJF algorithm  
(iii) Non preemptive SJF algorithm.
- (b) Differentiate various scheduling algorithms. 10

### SECTION – B

4. (i) Explain the difference between internal fragmentation and external fragmentation. Which

one occurs in Paging system ? Which one Occurs in systems using pure segmentation ? 10

(ii) What is thrashing ? When does it occur ? Explain. 10

5. Explain various page replacement algorithms with example. 20

6. Consider a file system on a disk that has both logical and physical block sizes of 512 bytes. Assume the information about each file is already in Memory. For each of the three allocation strategies (contiguous, Linked and indexed), answer these questions :

(i) How is the logical-to-physical address mapping accomplished in this system ? (For the indexed allocation, assume that a file is always less than 512 blocks long).

(ii) If we are currently at logical block 10 (the last block accessed was block 10) and want to access logical block 4, how many physical blocks must be read from the disk ?

Define the following :

(i) Sector, track, cylinder

(ii) seek time, latency time

(iii) Contiguous, indexed, linked allocation

(iv) SCAN algorithm.

7. (a) What are necessary conditions to hold a deadlock in a system ? Explain the Resource allocation

graph algorithm to deal with deadlock problem.  
What are the limitation of this approach' ? 10

(b) Define a critical section problem and its solution  
by using semaphore. Use this approach to solve  
Producer/consumer problem. 10

8. Describe various Unix system calls for processes & file  
system management. 20

9. Write short notes on :

(a) Programmed I/O 10

(b) Windows NT file system. 10