

2014  
B.E. (Information Technology)  
Fourth Semester  
PCIT-403: Operating System

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part.

x-x-x

1. Define the followings: (10)
- a) Long term scheduler
  - b) System call
  - c) Stateful Server
  - d) Index file allocation
  - e) Free Space Management

**PART - A**

2. a) What is critical section problem? How are semaphores help in handling this problem? Explain with the help of example. (6)
- b) Define process control block with diagram. (4)
3. (a) Why page size is always a power of 2? Can we run a process whose size is bigger than main memory size? How? (4)
- (b) In the following system: (4+2)

	MAX NEED			ALLOCATION				RESOURCE DETAILS		
	R1	R2	R3	R1	R2	R3		R1	R2	R3
P1	3	6	8	2	2	3	Total Allocated	5	4	10
P2	4	3	3	2	0	3				
P3	3	4	4	1	2	4	Total Exist	7	7	10

- (i) Is the current allocation state safe? If yes, what is the safe sequence?
- (ii) Would an additional request from process P1 (1,1,0) be granted in current state or not?
4. (a) Consider a system with 400 bytes of physical memory and page size of 100 bytes.
- (i) Give the reference string for the following sequence of logical addresses from a 900 byte programme:  
120, 405, 10, 234, 750, 223, 409, 345, 760, 858, 664.
- (ii) Calculate the number of page faults that would occur using LRU and Optimal replacement algorithms. (7)
- (b) What is thrashing? Discuss its impact on CPU utilization. (3)

(2)

**PART – B**

5. Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The current head position is at cylinder 143. The queue of pending requests is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130  
What is the total distance that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms: (10)
- i) SSTF
  - ii) LOOK
6. (a) Discuss in detail the deadlock detection and recovery techniques for distributed environment with example.
- (b) Explain the different types of cache updating policies. (7+3)
7. Write short note on any two of the followings: (10)
- a) Process Migration
  - b) Bully Election Algorithm
  - c) Unix file system

x-x-x