

2054
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) Demand Paging
 - b) Parallel System
 - c) TLB
 - d) External Fragmentation
 - e) Process Migration
 - f) Rotational Latency
 - g) Thrashing
 - h) Seek Time
 - i) CPU Utilization
 - j) Ready Queue

PART - A

2. a) What are necessary conditions for a deadlock to occur? How are resource allocation graphs helpful in determine whether a deadlock is there or not? (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?
3. a) What is process synchronization? How are semaphores used to handle this problem? (5)
- b) Explain the process state transition diagram along with the contents of PCB. (5)
4. a) Assuming main memory to be 400 bytes and page size 100 bytes, using Least Frequently Used algorithm for page replacement, calculate the number of page faults for following sequence of page references:
4, 8, 2, 3, 2, 8, 3, 1, 2, 6, 7 (5)
- b) Consider the memory management system based on paging. The total size of physical memory is 2 GB, laid out over page size of 8KB. The logical address space of each process has been limited to 256 MB. (1+1+1+2)
- (i) Determine the total number of bits in the physical address.

(2)

- (ii) Determine the number of page frames.
- (iii) Determine the number of bits in logical address.
- (iv) What will be the size of page table if one entry of page table required 2 bytes.

PART – B

- 5. Discuss the layout of UNIX file system. What is the layout of i-node? How does the path name get translated to i-node number. (10)
- 6. Suppose that a disk has 1000 cylinder, numbered 0 to 999. The drive is currently serving a request at cylinder 500. The queue of pending requests, in FIFO order is: 89, 450, 813, 276, 438, 149, 112, 750, 330. Starting from the current head position, what is the total distance that disk arm moves to satisfy all pending requests, for each of the following disk scheduling algorithm? (Show in graph also) (10)
 - A. FCFS
 - B. SSTF
 - C. C-LOOK
 - D. C-SCAN
- 7. Write short note on any two of the followings: (10)
 - a) File Allocation Methods
 - b) Network Operating System
 - c) Cache updation techniques

x-x-x