

2053
B.E. (Information Technology)
Fourth Semester
PC-IT-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)
- Parallel System
 - External Fragmentation
 - Process Migration
 - Rotational Latency
 - Thrashing

PART - A

2. a) Consider the following set of processes along with their arrival time and burst time. Draw the Gantt Chart and Calculate the average waiting time and average turn around time if the scheduling policies are
- Preemptive shortest job first
 - Preemptive Priority (3+3)

Process No.	Arrival Time	Burst Time	Priority (lowest number means highest priority)
P1	0	7	3
P2	2	7	2
P3	3	6	1
P4	5	5	2

- b) 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)
3. a) What is process synchronization? How are semaphores used to handle this problem? (6)
- b) Explain the process state transition diagram. (4)
4. a) Assuming main memory to be 4 KB and page size 1KB, 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 (4)

- b) In a 32-bit machine, using a 4-level paging , the logical address is divided into 5 segments as follows:

8-bits	6-bits	6-bits	6-bits	6-bits
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- What is the page size in such a system?
- What is the size of a page table for a process that has 512K of memory starting at address 0?
- What are the maximum number of pages for such process? (6)

P.T.O.

(2)

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) Free Space Management
 - b) Network Operating System
 - c) File Access Methods

x-x-x