

Paper Code: 3606

Paper Title: Operating System Principals

Time: 02:30 Hours

Marks: 70

Q1 Answer any FIVE from the following:

[10]

- Explain Distributed System.
- Write a note on memory protection.
- Explain Mutual exclusion, Hold and wait and No preemption conditions of Deadlock.
- If a process is allocated 4 Frames and pages reference string is as below then count the number of page fault in LRU Algorithm.
Reference String: 1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2.
- What do you mean by External Fragmentation?
- Explain Two levels Directory structure.
- What is polling?

Q2 Answer any FIVE from the following:

[15]

- What does Device Status Table store? Explain.
- Write a note on Real time system.
- Explain Fix Time Method and Variable Timer method of CPU Protection.
- Draw and explain Process state diagram.
- What is the mechanism of Demand Paging?
- Explain Bit Vector method and Linked list method of Free Space Management.
- Differentiate Synchronous I/O and Asynchronous I/O.

Q3 Answer any FIVE from the following:

[25]

- Which system calls are used for File management and Process management?
- Consider the following set of processes, with the length of the CPU burst time given in in milliseconds and perform Preemptive Priority scheduling algorithm on it and find out Average Waiting time and Average Turnaround time.

Process	CPU Burst	Priority	Arrival Time
P1	10	2	1
P2	5	1	3
P3	2	0	2
P4	4	2	0
P5	8	2	4

- What is Page fault? What are the steps taken by an operating system to handle page fault?
- Write a note on Sequential and direct file access methods.
- What is DMA? Write down steps for DMA transfer.

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- f. Discuss the Translation Look-aside buffer in paging.
- g. Explain following:
1) Swapper 2) Dual mode operation in os.

Q4 Answer any TWO from the following:**[20]**

- a. Write a note on Allocation methods with respect to Disk storage.
- b. Explain Banker's Safety algorithm for Deadlock avoidance.
Considering a system with five processes P_0 through P_4 and three resources types A, B, C. Resource type A has 10 instances, B has 5 instances and type C has 7 instances. Suppose at time t_0 following snapshot of the system has been taken:

Process	Allocation	Max	Available
	A B C	A B C	A B C
P_0	0 1 0	7 5 3	3 3 2
P_1	2 0 0	3 2 2	
P_2	3 0 2	9 0 2	
P_3	2 1 1	2 2 2	
P_4	0 0 2	4 3 3	

What will be the content of the Need matrix?

Is the system in safe state? If Yes, then what is the safe sequence?

- c. Explain SSTF, SCAN and C-SCAN algorithms and perform these three algorithms on given below disk queue and find out Average Seek Time for each algorithms.

Queue: 98,183,37,122,14,124,65,67 (Arrange in ascending order from 0 to 199)

Head starts at: 53