

B3.4-R4 : OPERATING SYSTEMS**NOTE :**

1. Answer question 1 and any FOUR from questions 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time : 3 Hours**Total Marks : 100**

1. (a) What is a process ? Explain different states of a process.
(b) Explain Multithreading models.
(c) How to view contents of a file in Linux ?
(d) Explain time sharing and clustered operating system.
(e) Write a short note on fragmentation.
(f) How to list, handle and manage files in Linux ?
(g) How to prevent a system from deadlock ?
(7x4)
2. (a) Explain the difference among short-term, medium-term, and long-term scheduling.
(b) Why is disk scheduling important ?
(c) Describe the actions taken by a kernel to context-switch between processes. (6+6+6)
3. (a) What is the reason behind Belady's Anomaly ? Explain in detail.
(b) Consider a two level paging scheme with a TLB. Assume no page fault occurs. It takes 20 ns to search the TLB and 100 ns to access the physical memory. If TLB hit ratio is 80%, then calculate the effective memory access time.
(c) Explain SCAN Disk scheduling algorithm with its advantages and disadvantages. (6+6+6)
4. (a) Let the page fault service time be 10 ms in a computer with average memory access time being 20 ns. If one page fault is generated for every 10^6 memory accesses, what is the effective access time for the memory ?
(b) What is a race condition ? Illustrate with example why the presence of race condition is considered as bad design ?
(c) How is process management achieved in UNIX ? (6+6+6)

5. (a) A single processor system has three resource types X, Y and Z, which are shared by three processes. There are 5 units of each resource type. Consider the following scenario, where the column alloc denotes the number of units of each resource type allocated to each process, and the column request denotes the number of units of each resource type requested by a process in order to complete execution. Which of these processes out of P0, P1, and P2 will finish LAST ?

	Alloc			Request		
	X	Y	Z	X	Y	Z
P0	1	2	1	1	0	3
P1	2	0	1	0	1	2
P2	2	2	1	1	2	0

- (b) Explain how TLB is useful in implementing page table.
- (c) Write short notes on RAID and its level. Also explain stripping and Mirroring. (6+6+6)
6. (a) Define Thrashing. Also explain the cause of thrashing and discuss local(priority) replacement algorithm.
- (b) What kind of information can be associated with a Particular Process in Process Control Block ?
- (c) If there are 100 units of resource R in the system and each process in the system requires 4 units of resource R, then how many processes can be present at maximum so that no deadlock will occur ? (6+6+6)
7. (a) For a given set of processes as shown in the table below :

Process	Burst	Priority
P1	8	4
P2	6	1
P3	1	2
P4	9	2
P5	3	3

Calculate the average time and the average turnaround time by using :

- (i) FCFS
- (ii) SJF
- (iii) Non-preemptive priority
- (iv) Round robin (1 ms quantum)
- (b) Discuss structure of Distributed System. (9+9)

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