

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Additional/Backlog), December, 2024

B.Tech, BCA, Semester V, 2024-25

Roll No.....

CS1108: Operating Systems	Time: 2.5 hours	Max. Marks: 30
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Instructions to students:

- Do not write anything other than your roll number on question paper.
- Mention all the assumptions for your answers clearly.

Q1	Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 41, 122, 14, 124, 65, 67. The head is initially at cylinder number 53. The cylinders are numbered from 0 to 199. Calculate the total head movement (in number of cylinders) incurred while servicing these requests for the following disk scheduling algorithms: (a) FCFS (b) SSTF (c) SCAN (d) C-SCAN (e) LOOK (f) C-LOOK	(6*1.5=9) (LO5)
Q2	Consider six memory partitions of size 200 KB, 400 KB, 600 KB, 500 KB, 300 KB and 250 KB. These partitions need to be allocated to four processes of sizes 357 KB, 210 KB, 468 KB and 491 KB in that order. Perform the allocation of processes using- (a) First Fit Algorithm (b) Best Fit Algorithm (c) Worst Fit Algorithm (d) Which of the above algorithms makes efficient use of memory in the given scenario?	(3*1.5+0.5=4.5) (LO4)
Q3	Elaborate any five: (a) Types of memory management techniques (b) Five CPU scheduling criteria (c) Belady's Anomaly (d) Thrashing (e) Translation Lookaside Buffer (TLB) in paging (f) Producer – Consumer Problem	(5 * 2.0 = 10) (LO 2,3)
Q4	(a) A counting semaphore was initialized to 12, then 10P (wait) and 4V (signal) operations were computed on this semaphore. What is the result?	2.0 (LO4)

	(b) Each process P_i, $i = 1, 2, \dots, 9$ is coded as follows- <pre>Repeat P(mutex) { Critical Section } V(mutex) Forever</pre> The code for P10 is identical except it uses V(mutex) in place of P(mutex). What is the largest number of processes that can be inside the critical section at any moment?	2.0 (LO4)
Q5	Consider a single processor system with four processes A, B, C, and D, represented as given below, where for each process the first value is its arrival time, and the second value is its CPU burst time. A (0, 10), B (2, 6), C (4, 3), and D (6, 7). Calculate the average waiting times when preemptive Shortest Remaining Time First (SRTF) and Non-Preemptive Shortest Job First (NP-SJF) CPU scheduling algorithms are applied to the processes?	2.5 (LO3)