

**JK Lakshmipat University Jaipur**  
**INSTITUTE OF ENGINEERING AND TECHNOLOGY**

End Term Examination, December 2023

BCA, Semester V, 2023-24

Roll No.....

CS1418: OPERATING SYSTEM AND LINUX  
ADMINISTRATION

Time: 2 hours

Max. Marks: 40

**Instructions to students:**

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

- Q. 1 (a) What are the different services provided by an operating system? 4.0  
(CO1)
- (b) What are the advantages and disadvantages of using multiprocessing operating system? 3.0  
(CO2)

- Q. 2 Consider the following set of processes P1, P2, P3, P4 (arriving in the order P1, P2, P3, P4) and their CPU burst times. Use FCFS and SJF algorithm to draw the Gantt Chart and to calculate the average waiting time, average turnaround time and average response time. Analyze the results, given the arrival time of all the processes is zero. 6.0  
(CO3)

| Process            | P1 | P2 | P3 | P4 |
|--------------------|----|----|----|----|
| Burst Time (msecs) | 6  | 8  | 7  | 3  |

- Q. 3 (a) What is race condition? How can we prevent race condition in an operating system? Explain with example. 5.0  
(CO4)
- (b) What are the necessary conditions for a deadlock to occur in an operating system? Explain in detail. 4.0  
(CO4)
- Q. 4 (a) Consider five memory partitions of size 100 KB, 500 KB, 200 KB, 450 KB and 600 KB in same order. If sequence of requests for blocks of size 212 KB, 417 KB, 112 KB and 426 KB in same order come, then which algorithm out of best fit, worst fit and first fit makes the efficient use of memory? 5.0  
(CO4)
- (b) Consider a demand paging system with four page frames (initially empty) and LRU page replacement policy. For the following page reference string 5.0  
(CO4)

7, 2, 7, 3, 2, 5, 3, 4, 6, 7, 7, 1, 5, 6, 1

what is the page fault rate (defined as the ratio of number of page faults to the number of memory accesses)?

- Q. 5 (a) What are the different file allocations methods? Explain in detail. 4.0  
(CO4, 5)
- (b) Discuss advantages and disadvantages of each file allocation method. 4.0  
(CO4, 5)

**OR**

- Q. 5 (a) What is seek time and latency time with respect to disk scheduling? 3.0  
(CO5)
- (b) Let's say there are seven requests: 16, 24, 43, 82, 140, 170 and 190. 5.0  
Additionally the disk arm is supposed to travel towards the larger number while (CO5)  
the read/write arm is at 50. What is the total seek time for the following disk  
scheduling algorithms?
- i. FCFS
  - ii. SSTF
  - iii. SCAN
  - iv. LOOK
  - v. C-LOOK
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