

comp/os

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May/June 2026

Program: B. Tech. Computer Engineering Scheme: III

Examination: Regular SY Semester: IV

Course Code: CEC403 and Course Name: Operating systems

Date of Exam: 23/05/26

Duration: 02.5 Hours

Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level															
Q 1	Solve any two questions out of three: (05 marks each)	10																	
a)	Write shell script for reversing a number		CO1	U															
b)	Describe the file Directory structure		CO5	U															
c)	Describe resource allocation graph with an example		CO3	U															
Q 2	Solve any two questions out of three: (05 marks each)	10																	
a)	Describe Producer Consumer Problem in detail		CO3	U															
b)	Describe Demand paging with a neat diagram		CO4	U															
c)	Describe the process life cycle with a neat diagram.		CO2	U															
Q.3	Solve any two questions out of three. (10 marks each)	20																	
a)	Consider following processes with their arrival time and CPU Burst time in milliseconds as follows. Draw Gantt Chart and calculate Completion time, Average Turnaround time and Average Waiting time using SRTF and Round Robin scheduling algorithm. (Time Quantum =2ms)		CO2	AP															
<table><tr><th>Process</th><th>Arrival Time</th><th>CPU Burst Time</th></tr><tr><td>P1</td><td>2</td><td>6</td></tr><tr><td>P2</td><td>1</td><td>5</td></tr><tr><td>P3</td><td>3</td><td>2</td></tr><tr><td>P4</td><td>0</td><td>7</td></tr></table>					Process	Arrival Time	CPU Burst Time	P1	2	6	P2	1	5	P3	3	2	P4	0	7
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b)	Describe Dining Philosophers problem with its algorithm		CO3	U																		
c)	Consider page reference string 1, 5, 3, 0, 5, 3, 2, 6, 3, 0, 4, 1, 0 with 3-page frames. Find the number of page faults using FIFO and LRU page replacement algorithm		CO4	AP																		
Q.4 Solve any two questions out of three. (10 marks each)		20																				
a)	Consider following processes with their arrival time and CPU Burst time in milliseconds as follows. Draw Gantt Chart and calculate Completion time, Average Turnaround time and Average Waiting time using FCFS and SJF non-preemptive scheduling algorithm . <table border="1"><thead><tr><th>Process</th><th>Arrival Time</th><th>CPU Burst Time</th></tr></thead><tbody><tr><td>P1</td><td>1</td><td>6</td></tr><tr><td>P2</td><td>3</td><td>4</td></tr><tr><td>P3</td><td>0</td><td>5</td></tr><tr><td>P4</td><td>2</td><td>2</td></tr><tr><td>P5</td><td>2</td><td>2</td></tr></tbody></table>		Process	Arrival Time	CPU Burst Time	P1	1	6	P2	3	4	P3	0	5	P4	2	2	P5	2	2	CO2	AP
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b)	Describe the Translation lookaside Buffer(TLB) with a neat diagram.(5M) Given Logical address space = 4GB, physical address space = 64MB and page size = 4KB. Find out the number of pages, number of frames and size of the page table(5M)	CO4	U,AP																			
c)	Consider the disk requests are 15, 12, 40, 34, 66, 39, 70, 26, and 94 . Current head position is 40. Total cylinders are 0 to 99. Calculate the total disk overhead movements by disk head using FCFS and SSTF disk scheduling algorithms.	CO6	AP																			