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

April – May 2023	
B. Tech Program: Computer Engineering Scheme: II	
Examination: SY Semester: II	
Course Code: CEC404 and Course Name: Operating System	
Date of Exam: 20-05-23 Duration: 2.5 Hours Max. Marks: 60	

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

Q. No.	Questions	Max. Marks	CO	BT Level
Q 1	**Solve any six questions out of eight:**	**12**		
i)	List various functions of an Operating system	2	CO1	U
ii)	Sketch a neat diagram of various states of a process and explain each in brief.	2	CO2	U
iii)	Explain the Deadlock Recovery strategies.	2	CO3	U
iv)	Consider page reference string 2,3,3,4,5,6,7,4 with 3-page frames. Find the number of page faults using Optimal Page Replacement Algorithm.	2	CO4	Ap
v)	Explain various file attributes used in Operating Systems.	2	CO5	U
vi)	Suppose the order of request is- (20,40,30,56,43,86) And current position of Read/Write head is: 25. Find total no of head movements using FCFS disk scheduling algorithm.	2	CO6	Ap
vii)	Explain importance of Inter Process Communication in Operating Systems with suitable example.	2	CO2	U
viii)	Explain importance of Paging in Operating System.	2	CO4	U
Q.2	**Solve any four questions out of six.**	**16**		
i)	Define System calls & explain all System Calls related to file operations.	4	CO1	U
ii)	List various Process scheduling policies. Solve using Round Robin Algorithm with time quantum of 3ms.	4	CO2	Ap
iii)	What is Semaphore? Explain how to solve any classic Inter Process Communication Problem.	4	CO3	U
iv)	Solve using First Fit and Best Fit Memory Management Algorithm and analyze the results. Process Requests: 200K, 300K, 120K, 300K Available Memory Slots: 130K, 400K, 300K, 600K, 350K	4	CO4	An
v)	Describe File organization in Operating System.	4	CO5	U
vi)	Explain interrupt handling in I/O processing.	4	CO6	U
Q.3	**Solve any two questions out of three.**	**16**		
i)	What is Shell. Explain Significance of shell programming. Write a program for calculator using Switch-Case.	8	CO1	Ap
ii)	What is Memory Management Unit? Explain its significance with the help of Paging Hardware diagram.	8	CO4	U

For Q.2 ii):

Process	Burst Time	Arrival Time
P1	10	0
P2	8	5
P3	4	4
P4	2	0

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iii)	Explain Directory Structure in Operating System. How directories are shared in multiuser environment.	8	CO5	U
Q.4	**Solve any two questions out of three:**	**16**		
i)	Consider the following five processes each having its burst time and arrival time. Calculate their average waiting time and average turnaround time using Round Robin Algorithm with time quantum of 2ms & 5ms. Analyze your results.	8	CO2	An

Process	Burst Time	Arrival Time
P1	6	0
P2	4	3
P3	1	4
P4	5	2

ii)	A uni-processor system has three resource types X, Y and Z, which are shared by three processes. There are 5 units of each resource type. Which of these processes will finish LAST?	8	CO3	Ap

Process	Allocation			Max Requests		
	X	Y	Z	X	Y	Z
P1	1	2	1	1	0	3
P2	2	0	1	0	1	2
P3	2	2	1	1	2	0

iii)	Assume disk head position at 26. Calculate total Disk Head Movements using C-SCAN and SSTF Disk Scheduling Algorithm for following requests: 20,54,23,76,54,32,23. Analyze your results.	8	CO6	An

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