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

April - May 2024

Program: B.Tech Information Technology Scheme: II

Supplementary Examination: SY Semester: IV

Course Code: ITC403 and Course Name: Operating System

Date of Exam: 30/07/2024

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.

		Max. Marks	CO	BT level
Q 1)	Solve any six questions out of eight:	12		
i)	Describe characteristics of Modern Operating System.	2	CO1	U
ii)	Define the term Scheduler along with its types.	2	CO2	U
iii)	Explain Multithreading model.	2	CO2	U
iv)	Discuss Producer-Consumer problem.	2	CO3	U
v)	What is Segmentation? What are its advantages.	2	CO4	U
vi)	Explain the concept of Virtual memory.	2	CO4	U
vii)	Explain different File Access methods.	2	CO5	U
viii)	Explain the Network operating system.	2	CO6	U
Q 2)	Solve any four questions out of six.	16		
i)	Explain the difference between Monolithic and Micro kernel.	4	CO1	U
ii)	What is meant by Inter Process Communication (IPC)? Explain various models of it.	4	CO2	U
iii)	Apply Peterson's algorithm to overcome the problem of to overcome the problem of Critical Region.	4	CO3	A
iv)	Explain the concept of Paging and Segmentation with respect to Memory Management.	4	CO4	U
v)	Explain the RAID model with respect to Storage Management.	4	CO5	U
vi)	Differentiate between Peer-to-peer and Client Server Network Operating System.	4	CO6	U

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Q 3)	Solve any two questions out of three.	16																														
i)	The services and functions provided by an operating system can be divided into two main categories. Briefly describe the two categories and discuss how they differ?	8	CO1	U																												
ii)	Describe the Page Replacement Algorithms along with one example.	8	CO4	A																												
iii)	Explain the RAID 0, RAID 1, RAID 5 and RAID 6 structures in detail.	8	CO5	A																												
Q 4)	Solve any two questions out of three.	16																														
i)	Explain Scheduling? Draw the Gantt chart for FCFS, SJF preemptive and round robin (quantum =3). Calculate the average waiting time and average turnaround time	8	CO2	A																												
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ii)	Consider the following snapshot of a system:	8	CO3	A																												
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With reference to banker's algorithm																																
a) Find the need matrix.																																
b) Determine whether the system is in a safe state.																																
iii)	Explain the structure of a Real Time Operating System and explain the reason for using RTOS.	8	CO6	An																												
