SY-Comp- Operating System.

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

August 2023
(B. Tech) Program: Computer Engineering Scheme: II
Examination: SY Semester: IV
Course Code: CEC404 and Course Name: Operating System

Date of Exam: 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)	Explain System Calls.	2	CO1	U
ii)	Explain importance of Process Control Block.	2	CO2	U
iii)	What are the operations performed on a semaphore.	2	CO3	U
iv)	Explain various sections from programming used for synchronization.	2	CO4	U
v)	Explain what is virtual memory?	2	CO5	U
vi)	List the various file permissions.	2	CO6	U
vii)	What are the various memory allocation techniques?	2	CO4	U
viii)	Explain paging?	2	CO5	U
Q.2	**Solve any four questions out of six.**	**16**		
i)	What is a shell program? Write basic commands used in Shell Programs.	4	CO1	U
ii)	Explain lifecycle of a process using process state diagram.	4	CO2	U
iii)	Explain the need of synchronization in operating system.	4	CO3	U
iv)	List and explain various memory management methods.	4	CO4	U
v)	Distinguish between internal and external fragmentation using diagram.	4	CO5	U
vi)	Explain the system call sequence to read data from one file and copying it to another file.	4	CO6	U
Q.3	**Solve any two questions out of three.**	**16**		
i)	List and explain functions of Operating System. Explain monolithic architecture with diagram.	8	CO1	U
ii)	a. Explain Resource Allocation Graphs. b. Find the allocation, request and availability for resources by using the graph mentioned below.	8	CO4	Ap

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	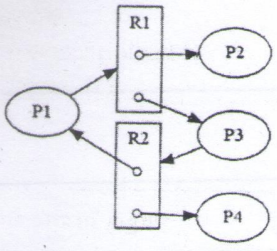			
iii)	Consider the following page reference string: 1, 1,2,2,3,3,2,2,1,1 How many page faults would occur for the following page replacement algorithms, assuming three frames? a. FIFO replacement b. LRU replacement Which algorithm performs well? Justify your answer.	8	CO5	An
Q.4	**Solve any two questions out of three.**	**16**		
i)	Consider the following set of processes, with the length of the CPU burst given in milliseconds. **Process ID** / **Arrival Time** / **Burst Time** **P1** 0 10 **P2** 3 6 **P3** 7 1 **P4** 8 3 a. Draw Gantt chart to illustrate the execution of these processes using Round Robin CPU scheduling algorithms with time quantum of 3ms. b. Calculate the turnaround time and waiting time for each process	8	CO2	Ap
ii)	Explain use of semaphore in Inter Process Communication. Demonstrate the Reader's Writer's classical problem of synchronization and give its solution with respect to semaphore variables.	8	CO3	U
iii)	Explain hard disk structure with suitable diagram. Explain the hierarchy of various storage media used in operating system with diagram.	8	CO6	U

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