



SOMAIYA
VIDYAVIHAR UNIVERSITY

Semester: August 2022 – December 2022 – Jan-2023		
Maximum Marks: 100	Examination: ESE Examination – Re-Exam Duration: 3 Hrs.	
Programme code: 01	Class: TY	Semester: V (SVU 2020)
Programme: Computer Engineering		
Name of the Constituent College: K. J. Somaiya College of Engineering		Name of the department: Computer
Course Code: 116U01C503	Name of the Course: Operating System	
Instructions: 1) Draw neat diagrams 2) All questions are compulsory 3) Assume suitable data wherever necessary		

Que. No.	Question	Max. Marks
Q1	Solve any Four	20
i)	What is operating system? List the objectives and functions of operating system	5
ii)	Differentiate between monolithic and structured layer of OS	5
iii)	Draw and explain 7-state diagram of life cycle of a process	5
iv)	Explain semaphores and its different types .	5
v)	Explain hierarchical paging	5
vi)	What is segmentation? State its usage.	5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	Suppose that a disk drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at cylinder 2150 and the previous request was at cylinder 1805. The queue of pending requests in FIFO order is 2069, 1212, 2296, 2800, 544, 1618, 356, 1523, 4965, 3681. Starting from the current head position, what is the total distance(in cylinders) that the disk arm moves to satisfy all pending requests for the following Disk scheduling algorithms (i) SCAN (ii) C-LOOK	5
ii)	Explain any two I/O Buffering techniques	5
OR		
Q2 A	What are the various allocation methods with reference to file systems	10
Q 2 B	Solve any One	10
i)	What are the five major categories of system calls? Explain giving one example from each	10
ii)	Differentiate between Network OS and Distributed OS	10

Que. No.	Question	Max. Marks
Q3	Solve any Two	20
i)	What are the requirements of mutual exclusion? Give software approaches to achieve mutual exclusion.	10
ii)	What is deadlock? Explain various deadlock prevention techniques.	10
iii)	What is critical section problem? Explain different ways to solve critical section problem	10

Que. No.	Question	Max. Marks																								
Q4	Solve any Two	20																								
i)	<p>Consider the following set of Processes with the length of CPU burst given in ms</p> <table><tr><th>Process</th><th>Burst time</th><th>Priority</th><th>Arrival time</th></tr><tr><td>P1</td><td>27</td><td>5</td><td>0</td></tr><tr><td>P2</td><td>6</td><td>3</td><td>3</td></tr><tr><td>P3</td><td>7</td><td>1</td><td>5</td></tr><tr><td>P4</td><td>10</td><td>2</td><td>10</td></tr><tr><td>P5</td><td>15</td><td>4</td><td>13</td></tr></table> <p>Assume smaller number implies higher priority.</p> <p>(i) Draw the Gantt chart for FCFS, SJF, Priority (Pre-emptive) and Round Robin (Quantum = 2).</p> <p>(ii) Which algorithm results in maximum average waiting time?</p> <p>(iii) Calculate average turnaround time for each of the above algorithms</p>	Process	Burst time	Priority	Arrival time	P1	27	5	0	P2	6	3	3	P3	7	1	5	P4	10	2	10	P5	15	4	13	10
Process	Burst time	Priority	Arrival time																							
P1	27	5	0																							
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P5	15	4	13																							
ii)	Explain Multithreaded model of a process..	10																								
iii)	Explain multilevel Queue scheduling	10																								

Que. No.	Question	Max. Marks
Q5	Answer any four	20
i)	Write a short note on File organization.	5
ii)	Explain the role of PCB in Process management. Why are two modes of execution needed	5
iii)	Discuss the semaphore solution for Reader/ Writer Problem.	5
iv)	Write short note on Virtual memory.	5
v)	Explain Demand paging	5
vi)	Discuss the monitor solution for dining philosopher problem	5