

AMRUTVAHINI COLLEGE OF ENGINEERING SANGAMNER

DEPARTMENT OF COMPUTER ENGINEERING

SUB: - Systems Programming and Operating System (2019)

CLASS: - T.E. (Sem V)

DURATION: - 2:30 hrs

Prelim (2022 - 2023)

MAX. MARKS: - 70

Q.No		Questions	Marks	CO	PO	PS O	BT Level																					
1	a	Explain briefly different types of loader? Discuss various tasks performed by loader?	8	CO3	1-4,12	1,2,3	4																					
	b	Explain briefly entries of ESD, TXT, RLD & Global External Symbol Table(GEST) using suitable example and load it by considering initial program load address as 190?	9	CO3	1,3,12	1,3	4																					
		OR																										
2	a	What is need of DLL? Differentiate between static and dynamic linking libraries?	8	CO3	1-4,12	1,2,3	4																					
	b	Explain general loader scheme with suitable example along with its advantages and disadvantages?	9	CO3	1,3,12	1,3	4																					
3	a	What is operating system? Draw and explain layered approach along with services provided by each?	9	CO4	1,3,12	1,3	4																					
	b	Draw Gantt chart and calculate Average turnaround time, Average waiting time for the following processes using RR scheduling and SJF scheduling policies with quantum time 4 unit. <table border="1"><thead><tr><th>Process ID</th><th>Arrival Time</th><th>Burst Time</th></tr></thead><tbody><tr><td>1</td><td>0</td><td>5</td></tr><tr><td>2</td><td>1</td><td>6</td></tr><tr><td>3</td><td>2</td><td>3</td></tr><tr><td>4</td><td>3</td><td>1</td></tr><tr><td>5</td><td>4</td><td>5</td></tr><tr><td>6</td><td>6</td><td>4</td></tr></tbody></table>	Process ID	Arrival Time	Burst Time	1	0	5	2	1	6	3	2	3	4	3	1	5	4	5	6	6	4	9	CO4	1-4,12	1,2,3	4
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4	a	Explain various process states? Draw and explain 5 state and 7 state process model?	9	CO4	1-4,12	1,2,3	4																					
	b	Differentiate between process and thread? Also explain benefits of using thread?	9	CO4	1,3,12	1,2,3	4																					
5	a	How to solve Dining- Philosopher problems using semaphores? Illustrate with algorithms.	8	CO5	1-4,12	1,2,3	3																					
	b	Using Banker’s algorithm, answer the following questions:-	9	CO5	1-4,12	1,2	4																					

		<p>i) Find if the system is in safe state? If it is, find the safe sequence.</p> <p>ii) What are the contents of need matrix?</p> <p>iii) How many resources of type P, Q, R, S are there?</p> <table><tr><th>Process</th><th>Max P Q R S</th><th>Allocation P Q R S</th><th>Available P Q R S</th></tr><tr><td>P0</td><td>6 0 1 2</td><td>4 0 0 1</td><td>3 2 1 1</td></tr><tr><td>P1</td><td>2 7 5 0</td><td>1 1 0 0</td><td></td></tr><tr><td>P2</td><td>2 3 5 6</td><td>1 2 5 4</td><td></td></tr><tr><td>P3</td><td>1 6 5 3</td><td>0 6 3 3</td><td></td></tr><tr><td>P4</td><td>1 6 5 6</td><td>0 2 1 2</td><td></td></tr></table>	Process	Max P Q R S	Allocation P Q R S	Available P Q R S	P0	6 0 1 2	4 0 0 1	3 2 1 1	P1	2 7 5 0	1 1 0 0		P2	2 3 5 6	1 2 5 4		P3	1 6 5 3	0 6 3 3		P4	1 6 5 6	0 2 1 2						
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6	a	Can we apply Peterson’s solution to the system with more than two processes to solve critical section problem? If no or yes then illustrate reason.	8	CO5	1,2,12	1,3	4																								
	b	Identify and explain the factors which affect process for termination to recover from deadlocks?	9	CO5	1-4,12	1,2,3	4																								
7	a	Consider given page sequence 2,1,3,2,5,2,4,5,1,2,5,2,4,1,3,5,1,5 and size of frame is 3. Show the output of FIFO, LRU and Optimal page replacement algorithm and Specify which is better?	9	CO6	1-4,12	1,3	4																								
	b	Differentiate between Dynamic Loading and Demand Paging. The particular module is load into the main memory when it is needed, is called Dynamic Loading. In Demand Paging, the particular page is loaded into the main memory when it is needed. Both don't seem to be same? If No, then illustrate reason with example.	9	CO6	1-4,12	1,2,3	4																								
		OR																													
8	a	A 1MB block of memory is allocated using the buddy system. Show the result of the following sequence: Request A 120,request B 80,request C 30, return A, request D 240, return B, , request E 60, return D, return C. return E.	9	CO6	1-3,12	1,2	4																								
	b	Consider six memory partitions of size 190 KB, 410 KB, 650 KB, 550 KB, 320 KB and 230 KB. These partitions need to be allocated to four processes of sizes 375 KB, 200 KB, 478 KB and 481 KB in that order. Perform the allocation of processes using- First Fit Algorithm, Best Fit Algorithm and Worst Fit Algorithm. Which method performs effective utilization of memory?	9	CO6	1-3,12	1,2	4																								

***** Best of Luck *****