

Velammal College of Engineering & Technology, Madurai-625 009
(Autonomous)
Department of Information Technology
Assignment No -1

Academic Year	2024 - 2025
Batch	2023 -2027
Course Code-Title	21CS208 – Operating Systems
Year/Semester/Sec	II/IV/A & B
Course Component	PROFESSIONAL CORE COURSES (PC)
Name of the Course Incharge	Mrs. M. Prabha, AP-II/IT and Mrs. R. Nancy Deborah, AP-III/IT
Assignment Submission Date	25.01.2025

COs	Statement	K Level
CO2	Make use of process scheduling, deadlocks and synchronization concepts to develop solutions for multi-programmed environment.	K3

Max. Marks: 20

Question No	Questions	Marks	K Level
1.	<p>a. Consider a single processor system with four processes A, B, C, and D, represented as given below, where for each process the first value is its arrival time and the second value is its CPU burst time.</p> <p>A (0, 10), B (2, 6), C (4, 3), and D (6, 7).</p> <p>Which one of the following options gives the average waiting times when preemptive Shortest Remaining Time First (SRTF) and Non-Preemptive Shortest Job First (NP-SJF) CPU scheduling algorithms are applied to the processes?</p> <p></p> <p>GATE CSE 2024 SET-2 Operating System</p>	4	K3
2.	<p>Consider four processes P, Q, R, and S scheduled on a CPU as per round robin algorithm with a time quantum of 4 units. The processes arrive in the order P, Q, R, S, all at time $t = 0$. There is exactly one context switch from S to Q, exactly one context switch from R to Q, and exactly two context switches from Q to R. There is no context switch from S to P. Switching to a ready process after the termination of another process is also considered a context switch. Which one of the following is NOT possible as CPU burst</p>	4	K3

	time (in time units) of these processes? GATE CSE 2022 Operating System																	
3.	Three processes arrive at time zero with CPU bursts of 16, 20 and 10 milliseconds. If the scheduler has prior knowledge about the length of the CPU bursts, the minimum achievable average waiting time for these three processes in a non-preemptive scheduler (rounded to nearest integer) is _____ milliseconds. GATE CSE 2021 SET-1 Operating System	4	K3															
4.	Consider the following set of processes, assumed to have arrived at time 0. Consider the CPU scheduling algorithms Shortest Job First (SJF) and Round Robin (RR). For RR, assume that the processes are scheduled in the order P_1, P_2, P_3, P_4 . <table border="1" data-bbox="386 604 894 726"> <tr> <td>Processes</td> <td>P_1</td> <td>P_2</td> <td>P_3</td> <td>P_4</td> </tr> <tr> <td>Burst time (in ms)</td> <td>8</td> <td>7</td> <td>2</td> <td>4</td> </tr> </table> <p>If the time quantum for RR is 4 ms, then the absolute value of the difference between the average turnaround times (in ms) of SJF and RR (round off to 2 decimal places) is _____</p> GATE CSE 2020 Operating System	Processes	P_1	P_2	P_3	P_4	Burst time (in ms)	8	7	2	4	4	K3					
Processes	P_1	P_2	P_3	P_4														
Burst time (in ms)	8	7	2	4														
5.	Consider the following four processes with arrival times (in milliseconds) and their length of CPU burst (in milliseconds) as shown below: <table border="1" data-bbox="375 1050 1235 1182"> <tr> <td>Process</td> <td>P1</td> <td>P2</td> <td>P3</td> <td>P4</td> </tr> <tr> <td>Arrival time</td> <td>0</td> <td>1</td> <td>3</td> <td>4</td> </tr> <tr> <td>CPU burst time</td> <td>3</td> <td>1</td> <td>3</td> <td>Z</td> </tr> </table> <p>These processes are run on a single processor using preemptive Shortest Remaining Time First scheduling algorithm. If the average waiting time of the processes is 1 millisecond, then the value of Z is _____.</p> GATE CSE 2019 Operating System	Process	P1	P2	P3	P4	Arrival time	0	1	3	4	CPU burst time	3	1	3	Z	4	K3
Process	P1	P2	P3	P4														
Arrival time	0	1	3	4														
CPU burst time	3	1	3	Z														
Evaluation Criteria	Each Problem is assigned with marks with a total of 20. In case of late submission, the total marks will be reduced by -1 for each day.																	
References	T2: Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 9 th edition, John Wiley and Sons Inc., 2018.																	

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