Problem-01

Consider the set of 4 processes whose arrival time and burst time are given below

	Arrival Time	Burst Time		
		CPU Burst	I/O Burst	CPU Burst
P1	0	3	2	2
P2	0	2	4	1
P3	2	1	3	2
P4	5	2	2	1

If the CPU scheduling policy is Shortest Remaining Time First, calculate the average waiting time and average Turn-Around Time.

Problem-02

Let there are 3 processes in the system

Process	Burst Time	Arrival Time	Priority
P_1	5	0	2
P_2	15	1	3
P_3	10	2	1

Draw Gantt chart and find Average waiting time and Average turnaround time for the following scheduling algorithms

(i) Shortest Job First (both pre-emptive and non pre-emptive)
(ii) Priority Queue (pre-emptive)
(iii) Round Robin (Quantum = 2ms)

Problem-03

Five batch jobs A through E arrive at a computer center at almost the same time. They have estimated running times of 10, 6, 2, 4, and 8 minutes. Their priorities are 3, 5, 2, 1, and 4, respectively, with 5 being the highest priority. For each of the following algorithms, determine the mean process turnaround time.

(i) Round Robin
(ii) Priority Scheduling
(iii) FCFS
(iv) Shortest Job First

Problem-04

Consider the following five processes, with the length of the CPU burst given in milliseconds:

Process	Burst Time
P_1	10
P_2	29
P_3	3
P_4	7
P_5	12

Illustrate the First Come First Serve (FCFS), Non-Preemptive Shortest Job First (SJF) and Round Robin (RR) (Time Quantum=10 milliseconds) scheduling algorithms using Gantt chart.

Which algorithm will give the minimum average time?

Problem-05:

Consider three processes, all arriving at time zero, with total execution time of 10, 20 and 30 units respectively. Each process spends the first 20% of execution time doing I/O, the next 70% of time doing computation, and the last 10% of time doing I/O again. The operating system uses a shortest remaining compute time first scheduling algorithm and schedules a new process either when the running process gets blocked on I/O or when the running process finishes its compute burst. Assume that all I/O operations can be overlapped as much as possible. For what percentage of does the CPU remain idle?

A. 0%
B. 10.6%
C. 30.0%
D. 89.4%

Problem-06:

Consider the set of 3 processes whose arrival time and burst time are given below-

Process No.	Arrival Time	Priority	Burst Time		
			CPU Burst	I/O Burst	CPU Burst
P1	0	2	1	5	3
P2	2	3	3	3	1

P3	3	1	2	3	1

If the CPU scheduling policy is Priority Scheduling, calculate the average waiting time and average Turn Around time. (Lower number means higher priority)

Problem-07:

Given five memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB (in order), how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)?Which algorithm makes the most efficient use of memory?