1. Given the arrival times, burst times and priority values for the processes below. Draw gantt charts and calculate the average waiting time and turnaround time using the scheduling algorithms given below:
    I. First Come First Serve
    II. Shortest Remaining Job First
    III. Preemptive Priority
    IV. Round Robin (time quantum: 5)

Process	Arrival Time	Burst Time	Priority
P1	0	8	4
P2	2	6	1
P3	2	1	2
P4	1	9	2
P5	3	3	3

Answer:

I. FCFS:
Avg. Waiting: 12.8
Avg. Turnaround: 18.2

II. SRJF:
Avg. Waiting: 6.2
Avg. Turnaround: 11.6

III. Preemptive Priority:
Avg. Waiting: 9.2
Avg. Turnaround: 14.6

IV. Round Robin:
Avg. Waiting: 15
Avg. Turnaround: 20.4

2. Given the arrival times and burst times for the processes below, draw a gantt chart using multilevel feedback queue scheduling algorithm showing the states of the ready queues of different levels. Then calculate the average waiting time, response time and turnaround time. There are 3 queues with decreasing priority all using round robin scheduling algorithm internally. **Q1 (quantum: 3, priority:0), Q2 (quantum:5, priority: 1), Q3 (quantum:10, priority:2)**

Process	Arrival Time	Burst Time
P1	0	10
P2	2	23
P3	5	18
P4	7	16

Answer:
Avg. Waiting: 34
Avg. Response: 1
Avg. Turnaround: 50.75

3. Given the arrival time and burst time for the processes below, draw a gantt chart using multilevel feedback queue scheduling algorithm showing the states of the ready queues of different levels. Then calculate the average waiting time, response time and turnaround time. There are 3 queues with decreasing priority all using round robin scheduling algorithm internally. **Q1 (quantum: 3, priority:0), Q2 (quantum:5, priority: 1), Q3 (quantum:10, priority:2)**. In case of I/O request, a process will be promoted one level upon I/O completion.

Process	Arrival Time	Burst Time	I/O Request
P1	0	10	3s IO after 7s CPU
P2	2	23	4s I/O after 5s CPU 3s I/O after 12s CPU
P3	5	18	N/A
P4	7	16	2s I/O after 11s CPU

Answer:
Avg. Waiting: 27.25
Avg. Response: 1
Avg. Turnaround: 47.25