AMRITSAR GROUP OF COLLEGES
(AUTONOMOUS COLLEGE)
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

B. Tech. (CSE) 4th SEM
OPERATING SYSTEM
ACCS - 16402
Tutorial-1

1. Given the following information:

Job	Arrival Time	Burst Time	Priority
1	0	75	3
2	10	40	1
3	10	25	4
4	80	20	5
5	85	45	2

Give Gantt chart and calculate Avg. Turn-around Time and Waiting Time for:

i. FCFS
ii. SJF (Preemptive) scheduling
iii. Preemptive priority algorithm

Assume a small integer means higher priority.

2. For the following processes given below:

Process	Burst time	Priority
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

Draw the Ghant chat and Calculate Average waiting time in SJF (Preemptive and non-preemptive) and priority scheduling (preemptive and non preemptive.)

3. Consider the following the set of processes that arrives at the time 0 ms:

Process	Burst time
P1	20
P2	3
P3	4

If we use time quantum of 4 ms then calculate the average waiting time using R-R scheduling.

4. Consider the following set of processes

Process	CPU Burst time	Arrival time	Priority
P1	5	0	2
P2	15	1	3
P3	10	2	1

Assuming 1 to be the highest priority
Calculate average turnaround time and average waiting time using FCFS, SJF (preemptive and non preemptive), priority (preemptive and non preemptive) scheduling algorithm and RR scheduling algorithm.

5. Define the term process. Assume that following jobs have arrived in the order 1,2,3,4 and 5:

Job	Arrival Time	Burst Time	Priority
1	0	15	2
2	2	03	1
3	5	05	5
4	6	08	4
5	7	12	3

Give Gantt chart and calculate Avg. Turn-around Time and Waiting Time for:

a) FCFS

b) SJF (Preemptive) scheduling

c) Preemptive priority algorithm

6. For the following processes

Process	Arrival time	Processing time
P1	0	3
P2	1	6
P3	4	4
P4	6	2

Draw the Ghant chart using

I. FCFS
II. SJF
III. RR (time quantum=2)
IV. RR (time quantum=1)

7. Consider the following set of process with the length of CPU burst time in milliseconds:-

Process	Burst Time	Priority
P1	7	3
P2	9	2
P3	2	1
P4	1	4
P5	3	5

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 and all at time 0.

a) Draw Gantt chart, illustrating the execution of these processes using FCFS, SJF, preemptive priority and RR (quantum = 1) scheduling.

b) What is turnaround time of each process for each of the following scheduling algorithm in Part A?

c) What is the waiting time for each process for each of the scheduling algorithms in Part A?

8. For the following processes given below:

Process	Burst time	Priority
P1	6	3
P2	2	1
P3	3	4
P4	1	5
P5	5	2

Draw the Ghant chat and calculate the average waiting time using priority scheduling (preemptive and non-preemptive.)

9. Consider the following table of arrival time and burst time for three processes P0, P1 and P2.

Process	Arrival time	Burst Time
P0	0 ms	9 ms
P1	1 ms	4 ms
P2	2 ms	9 ms

The pre-emptive shortest job first scheduling algorithm is used. Scheduling is carried out only at arrival or completion of processes. What is the average waiting time for the three processes?

10. For the processes listed in the following table, which of the following scheduling schemes will give the lowest average turnaround time?

Process	Arrival Time	Processing Time
A	0	3
B	1	6
C	4	4
D	6	2

a) FCFS
b) Non preemptive SJF
c) Shortest remaining time
d) RR with quantum value two

11. Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	3	1
P2	1	4

P3	4	2
P4	0	6
P5	2	3

If the CPU scheduling policy is SJF non-preemptive, calculate the average waiting time and average turnaround time.

12. Consider the set of 6 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	0	7
P2	1	5
P3	2	3
P4	3	1
P5	4	2
P6	5	1

If the CPU scheduling policy is shortest remaining time first, calculate the average waiting time and average turnaround time.

13. Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time
P1	3	1

P2	1	4
P3	4	2
P4	0	6
P5	2	3

If the CPU scheduling policy is SJF preemptive, calculate the average waiting time and average turnaround time.

14. Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	**Arrival time**	**Burst time**
P1	0	5
P2	1	3
P3	2	1
P4	3	2
P5	4	3

If the CPU scheduling policy is Round Robin with time quantum = 2 unit, calculate the average waiting time and average turnaround time.

15. Consider the set of 6 processes whose arrival time and burst time are given below-

Process Id	**Arrival time**	**Burst time**
P1	0	4

P2	1	5
P3	2	2
P4	3	1
P5	4	6
P6	6	3

If the CPU scheduling policy is Round Robin with time quantum = 2, calculate the average waiting time and average turnaround time.

16. Consider the set of 6 processes whose arrival time and burst time are given below-

Process Id	**Arrival time**	**Burst time**
P1	5	5
P2	4	6
P3	3	7
P4	1	9
P5	2	2
P6	6	3

If the CPU scheduling policy is Round Robin with time quantum = 3, calculate the average waiting time and average turnaround time.

17. Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time	Priority
P1	0	4	2
P2	1	3	3
P3	2	1	4
P4	3	5	5
P5	4	2	5

If the CPU scheduling policy is priority non-preemptive, calculate the average waiting time and average turnaround time. (Higher number represents higher priority)

18. Consider the set of 5 processes whose arrival time and burst time are given below-

Process Id	Arrival time	Burst time	Priority
P1	0	4	2
P2	1	3	3
P3	2	1	4
P4	3	5	5
P5	4	2	5

If the CPU scheduling policy is priority preemptive, calculate the average waiting time and average turnaround time. (Higher number represents higher priority)