## ****Problem-01:****

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

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

 If the CPU scheduling policy is FCFS, calculate the average waiting time and average turn around time.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Process id | Arrival time | Burst time | Completion time | Turnaround time | Waiting time |
| P1 | 3 | 4 | 7 | 4 | 0 |
| P2 | 5 | 3 | 13 | 8 | 5 |
| P3 | 0 | 2 | 2 | 2 | 0 |
| P4 | 5 | 1 | 14 | 9 | 8 |
| P5 | 4 | 3 | 10 | 6 | 3 |

Gantt chart

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| P3 | idle | P1 | P5 | P2 | P4 |

0 2 3 7 10 13 14

Avg Turn Around time =5.8

Avg Waiting time =3.2

## ****Problem-02:****

 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 turn around time.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Process id | Arrival time | Burst time | Completion time | Turnaround time | Waiting time |
| P1 | 3 | 1 | 4 | 1 | 0 |
| P2 | 1 | 4 | 6 | 5 | 1 |
| P3 | 4 | 2 | 8 | 4 | 2 |
| P4 | 0 | 6 | 16 | 16 | 10 |
| P5 | 2 | 3 | 9 | 9 | 6 |

Gantt chart

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| P4 | P2 | P2 | P1 | P2 | P2 | P3 | P3 | P5 | P4 |

0 1 2 3 4 5 6 7 8 11 16

Avg Turn Around time =7

Avg Waiting time =3.8

## ****Problem-03:****

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 turn around time.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Process id | Arrival time | Burst time | Completion time | Turnaround time | Waiting time |
| P1 | 0 | 7 | 19 | 19 | 12 |
| P2 | 1 | 5 | 13 | 12 | 7 |
| P3 | 2 | 3 | 6 | 4 | 1 |
| P4 | 3 | 1 | 4 | 1 | 0 |
| P5 | 4 | 2 | 9 | 5 | 3 |
| P6 | 5 | 1 | 7 | 2 | 1 |

Avg Turn Around time =7.1666

Avg Waiting time =4

## ****Problem-04:****

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 turn around time.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Process id | Arrival time | Burst time | Completion time | Turnaround time | Waiting time |
| P1 | 0 | 5 | 13 | 13 | 8 |
| P2 | 1 | 3 | 12 | 11 | 8 |
| P3 | 2 | 1 | 5 | 3 | 2 |
| P4 | 3 | 2 | 9 | 6 | 4 |
| P5 | 4 | 3 | 14 | 10 | 7 |

Avg Turn Around time =8.6

Avg Waiting time =5.8