1.

Considering there are 5 processes in the system, their arrival time, burst time and priority are list below:

Process Arrival Time (ms) Burst Time (ms) Priority

P1 0 5 5

P2 5 10 1

P3 5 5 2

P4 5 10 4

P5 5 5 3

The process P1 arrives at 0 ms, and P2, P3, P4, P5 arrives at 5ms with the order P2, P3, P4, P5. In Priority column, smaller number indicates higher priority.

(a) Please draw four Gantt charts to reflect the execution of 5 process using FCFS, RR with time quantum = 5, Non-preemptive SJF, and Non-preemptive Priority Scheduling.

(b) Please calculate the average waiting time with FCFS, RR with time quantum =5, and Non-preemptive Priority Scheduling.

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| 1  （a)  FCFS   |  |  |  |  |  | | --- | --- | --- | --- | --- | | P1 | P2 | P3 | P4 | P5 |   0 5 15 20 30 35  RR   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | P1 | P2 | P3 | P4 | P5 | P2 | P4 |   0 5 10 15 20 25 30 35  Non-preemptive SJF   |  |  |  |  |  | | --- | --- | --- | --- | --- | | P1 | P3 | P5 | P2 | P4 |   0 5 10 15 25 35  Non-preemptive Priority   |  |  |  |  |  | | --- | --- | --- | --- | --- | | P1 | P2 | P3 | P5 | P4 |   0 5 15 20 25 35  (b)  FCFS: P1(waiting time) = 0; P2(waiting time) = 0; P3(waiting time) = 10;  P4(waiting time) =15; P5(waiting time) = 25.  Average waiting time is (0+0+10+15+25)/5 = 10ms  RR: P1(waiting time) = 0; P2(waiting time) = 15; P3(waiting time) = 5;  P4(waiting time) =20; P5(waiting time) =15.  Average waiting time is (0+15+5+20+15)/5 = 11ms  Priority  P1(waiting time) = 0; P2(waiting time) = 0; P3(waiting time) = 10;  P4(waiting time) =20; P5(waiting time) =15.  Average waiting time is (0+0+10+20+15)/5 =9 ms |