**Assignment No: 2**

**Semester: Spring 2020**

**CS604: Operating Systems**

**Question No: 1**

Consider the following set of processes, with the CPUburst time given in milli seconds:

**Process Burst Time**

*P*1 10

*P*2 1

*P*3 2

*P*4 1

*P*5 5

The processes are arrived in the order *P*1, *P*2, *P*3, *P*4, *P*5, all at time 0.

1. Draw Gantt chart showing the execution of these processes using FCFS and SJF scheduling.
2. Calculate the turnaround time of each process for FCFS scheduling algorithm as per part Calculation of part **A?**
3. Calculate the waiting time of each process for SJF scheduling algorithm as per calculation of Part**A**?

**Solution (A):**

|  |  |  |
| --- | --- | --- |
| **Process** | **Arrival time** | CPU burst time(milliseconds) |
| P1 | 0 | 10 |
| P2 | 0 | 1 |
| P3 | 0 | 2 |
| P4 | 0 | 1 |
| P5 | 0 | 5 |

**Gantt Chart using FCFS**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **P1** | | | | | | | | | | | **P2** | **P3** | | **P4** | **P5** | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  | **10** | **11** |  | **13** | **14** |  |  |  |  | **19** |

**Gantt Chart using SJF**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **P2** | **P2** | **P3** | |  | **P5** | | | | | **P1** | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**0 1 2 4 10 20**

**Solution (B):**

**TURN AROUND TIME OF EACH PROCESS FOR FCFS SCHEDULING ALGORITHM**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Process** | **Arrival Time**  **(AT)**  **(milliseconds)** | **CPU Burst Time**  **(BT)**  **(milliseconds)** | **Completion Time (CT)**  **(milliseconds)** | **Turn Around time**  **TAT = CT-AT**  **(milliseconds)** |
| **P1** | **0** | **10** | **10** | **10– 0 = 10** |
| **P2** | **0** | **1** | **11** | **11 – 0 = 11** |
| **P3** | **0** | **2** | **13** | **13 – 0 = 13** |
| **P4** | **0** | **1** | **14** | **14 – 0 = 14** |
| **P5** | **0** | **5** | **19** | **19 – 0 = 19** |

**Solution (C):**

**WAITING TIME OF EACH PROCESS FOR SJF SCHEDULING ALGORITHM**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Processes** | **Arrival Time**  **(AT)**  **(Millisecond)** | **CPU Burst Time**  **(BT)**  **(Milliseconds)** | **Completion Time**  **(CT)**  **(Milliseconds)** | **Turnaround Time**  **TAT=CT-AT**  **(milliseconds)** | **Waiting Time**  **WT=TAT-BT**  **(milliseconds)** |
| **P1** | **0** | **10** | **19** | **19 – 0 = 19** | **19 - 10 = 9** |
| **P2** | **0** | **1** | **1** | **1 – 0 = 1** | **1 – 1 = 0** |
| **P3** | **0** | **2** | **4** | **4 – 0 = 4** | **4 – 2 = 2** |
| **P4** | **0** | **1** | **2** | **2 – 0 = 2** | **2 – 1 = 1** |
| **P5** | **0** | **5** | **9** | **9 – 0 = 9** | **9 – 5 = 4** |