**SCHEDULING CRITERIA**

Different CPU scheduling algorithms have different properties, and the choice of a particular algorithm depends on various factors. Many criteria have been suggested for comparing CPU scheduling algorithms. This scheduling criteria helps to compare and choose the CPU scheduling algorithm which works best for us.

The criteria include the following:

1. CPU utilization
2. Throughput
3. Turnaround time
4. Waiting time
5. Response time.

**1)CPU utilization:**

The main objective of any CPU scheduling algorithm is to keep the CPU as busy as possible. CPU Utilization represent that how much busy the CPU is? Theoretically, CPU utilization can range from 0 to 100 percent. In a real system, it should range from 40 percent (for a lightly loaded system) to 90 percent (for a heavily used system) depending on the load upon the system.

**2)Throughput:**

If the CPU is busy executing processes, then work is being done. One measure of work is the number of processes that are completed per time unit, called throughput. The throughput may vary depending on the length or duration of the processes. For long processes, this rate may be one process per hour; for short transactions, it may be 10 processes per second.

**3)Turnaround time:**

From the point of view of a particular process, the important criterion is how long it takes to execute that process. The interval from the time of submission of a process to the time of completion is the turnaround time. Turnaround time is the sum of the periods spent waiting to get into memory, waiting in the ready queue, executing on the CPU, and doing I/O.

The formula to calculate Turn Around Time is

**Turn Around Time = Completion Time(CT) – Arrival Time(AT)**

**4)Waiting time:**

The CPU scheduling algorithm does not affect the amount of time during which a process executes or does I/O; it affects only the amount of time that a process spends waiting in the ready queue. Waiting time is the sum of the periods spent waiting in the ready queue.

The formula for calculating Waiting Time is

**Waiting Time = Turnaround Time – Burst Time.**

**5)Response time:**

In an interactive system, turnaround time may not be the best criterion. Often, a process can produce some output fairly early and can continue computing new results while previous results are being output to the user. Thus, another measure is the time from the submission of a request until the first response is produced. This measure, called response time, is the time it takes to start responding, not the time it takes to output the response.

The formula to calculate Response Time is

**Response Time= CPU Allocation Time(when the CPU was allocated for the first) – Arrival Time**

The main goal of any CPU scheduling algorithm is to maximize CPU utilization and throughput and to minimize turnaround time, waiting time, and response time.

