

**GROUP ASSIGNMENT 1**  
**BSc. ICTB-II, ICTM-II, ITS-II & MICTEDU-II**  
**CSS 223 SEMESTER II 2022/2023**

**Do it in groups, each group should have 4 students only. The group should be formed based on your programs**

1. Describe the differences among short-term, medium-term, and long-term scheduling. **(3 Marks)**

- Short-term (CPU scheduler)
- Medium-term (memory manager):
- Long-term (job scheduler):

2. Describe the actions taken by a kernel to switch context **(2 Marks)**  
(a) Among threads  
(b) Among processes

3. Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. In answering the questions, use no preemptive scheduling and base all decisions on the information you have at the time the decision must be made. **(6 Marks)**

Process	Arrival Time	Burst Time
-----		
P1	0.0	8
P2	0.4	4
P3	1.0	1

- (a) What is the average turnaround time for these processes with the FCFS scheduling algorithm?
- (b) What is the average turnaround time for these processes with the SJF scheduling algorithm?
- (c) The SJF algorithm is supposed to improve performance, but notice that we chose to run process P1 at time 0 because we did not know that two shorter processes would arrive soon. Compute what the average turnaround time will be if the CPU is left idle for the first 1 unit and then SJF scheduling is used. Remember that processes P1 and P2 are waiting during this idle time, so their waiting time may increase. This algorithm could be known as future-knowledge scheduling.

4. Consider the following preemptive priority-scheduling algorithm based on dynamically changing priorities. Larger priority numbers imply higher priority. When a process is waiting for the CPU (in the ready queue, but not running), its priority changes at a rate *alpha*; when it is running, the priority changes at a rate *beta*. All processes are given a priority of 0 when they enter the ready queue for the first time. The parameters *alpha* and *beta* can be set to give many different scheduling algorithms. **(4 Marks)**

- (a) What is the algorithm that results from  $\beta > \alpha > 0$ ?

(b) What is the algorithm that results from  $\alpha < \beta < 0$ ?