



**Daffodil**  
*International*  
**University**

**Department of CIS**

**Subject: Operating System  
Fall 2020**

**You are trying to execute multiple tasks on your single core processor. The tasks have not all arrived at the same time and they have different times required to fully execute. These tasks are as follows –**

Task	Arrival Time	Burst Time
P1	5	26
P2	9	11
P3	6	14
P4	0	4
P5	2	1
P6	40	6

## **Theory Part (Marks – 35)**

### **Task 1 (Design)**

**Marks: 20**

Design the Gantt Chart for the 6 tasks mentioned above in the chart for the following scheduling algorithms and compare their average waiting and turnaround times to decide the best algorithm in this case –

- i) First Come, First Served
- ii) Shortest Job First
- iii) Shortest Remaining Time First

### **Task 2 (Simulation)**

**Marks: 8**

Suppose the tasks all arrived at 0 time instead of different arrival times. If that were the case, then design a Gantt chart and find the average waiting and turnaround times for Round Robin with a time quantum of 7.

### **Task 3 (Critical Evaluation)**

**Marks: 7**

In your task in Task 2, why did we select a time quantum of 6 rather than a smaller time quantum such as 3. Give proper reasoning behind your answer with respect to context switching.

## Lab Part (Marks – 25)

### Task 1 (Design)

**Marks: 5**

Design an algorithm for Shortest Remaining Time First scenario which would check whenever a new process enters if the new process has a smaller time to execute than the remaining time for the current process. If it does, then the scheduler would switch to the new process.

### Task 2 (Simulation)

**Marks: 15**

Write the code for the aforementioned algorithm in Java.

Your code should output the waiting and turnaround times for all the processes while also finding the average burst time and turnaround time. Example –

**“The task of P1 has a waiting time of \_\_\_\_ and a turnaround time of \_\_\_\_.”**

### Task 3 (Critical Evaluation)

**Marks: 5**

Explain the time complexity of your code briefly.

### Submission Guidelines:

- Your submission should be in the form of a single word-processed document (**.doc or .docx**) that includes any necessary diagrams.
- Naming of the file as **example: 183-16-315.docx**
- **Marks will be deducted accordingly if any plagiarism of work is provided.**

**DEADLINE: 15<sup>th</sup> December, 2020**