ourdiu.com | Shared by Abdullah Tawsif (CSE-232)

# Daffodil International University

**Faculty of Science & Information Technology**
**Department of Computer Science & Engineering**
**Midterm Examination, Fall 2025**
**Course Code: CSE323 , Course Title: Operating Systems**
**Level: 3 Term: 2 Batch: 64**

**Time: 01:30 Hrs** **Marks: 25**

## Answer ALL Questions [Optional]

*[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]*

In Daffodil International University, all teachers' PCs in a room are connected to a single printer. Mr. X shifted his room to KT-317 and connected his printer to his PC. The IT attendant helped him connect the PC to the printer server.

| | | | |
|---|---|---|---|
| *a)* | Explain what happens when Mr. X connects the printer to his PC in terms of operating system functions with necessary diagram. | [3] | CO1 |
| *b)* | Identify and justify the type of operating system used to maintain the printer server. | [2] | |

Mr. Y, while researching for his project, opens Google Chrome on his Windows laptop and searches for "history of operating systems". The browser loads several results including blogs, an AI summary, and a Wikipedia link. Curious, he clicks on Wikipedia to explore further.

| | | | |
|---|---|---|---|
| *a)* | Analyze how Chrome manages this activity internally in terms of browser architecture and the communication model among its processes. What makes this model efficient and secure? | [4] | CO2 |
| *b)* | When Mr. Y launched the browser, his operating system created a new process, and a system call was invoked through an API. Explain the relationship among the API, System Call, and OS with a diagram and illustrate how the system call is implemented and executed within the OS. | [4] | |
| *a)* | Consider the following set of processes with their arrival and burst times: | [6] 6 | CO3 |

| Process | Arrival Time (AT) | Burst Time (BT) |
|---|---|---|
| P1 | 0 | 8 |
| P2 | 1 | 4 |
| P3 | 2 | 9 |

ourdiu.com | Shared by Abdullah Tawsif (CSE-232)

| | | |
|---|---|---|
| P4 | 3 | 5 |
| P5 | 4 | 2 |

a. Apply the Shortest Remaining Time First (SRTF) scheduling algorithm to determine the completion time (CT), turnaround time (TAT), and waiting time (WT) for each process. Illustrate the Gantt chart and calculate the average turnaround time and average waiting time.

b. Justify the practicality of implementing SRTF in a real operating system. Why might it be difficult to determine the next shortest process in advance?

[6]

3

***b)*** Consider the following set of processes with their arrival and burst times:

| Process | Arrival Time (AT) | Burst Time (BT) |
|---|---|---|
| P1 | 0 | 7 |
| P2 | 1 | 4 |
| P3 | 2 | 9 |
| P4 | 3 | 5 |
| P5 | 4 | 6 |

Assume the time quantum = 3 units.

a. Apply the Round Robin scheduling algorithm to determine the completion time (CT), turnaround time (TAT), and waiting time (WT) for each process. Illustrate the Gantt chart and calculate the average turnaround time and average waiting time.

b. Explain how the length of the time quantum affects the response time, context switching, and the overall performance of the Round Robin scheduling algorithm.