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# Daffodil International University

## Faculty of Science & Information Technology

## Department of Software Engineering

**Midterm Examination, Summer 2026**

**Course Code: SE 232; Course Title: Operating System & System Programming**

**Sections & Teachers: 43(A-O), IS(A-C), SSR(D), HBM(E,N), SAM(F), MAS(G,H), FJT(I,J), FRN(K,L,M), TR(O)**

**Time: 1 Hour 30 Mins** **Marks: 25**

## Answer ALL Questions

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

| | | | | |
|---|---|---|---|---|
| **1.** | | A student is working on a computer to prepare a lab report for SE233. At the same time, the student is attending an online class, downloading study materials, listening to music, and compiling a program. The operating system rapidly switches the CPU among these activities so that all tasks appear to run simultaneously. This operating system is designed with only essential functions running in kernel mode. Services like the file system, printer service, and network driver run as separate user-level processes. When the compilation finishes, the student saves the output and sends it to the printer. During printing, the network driver crashes, but the operating system continues running, and the driver is restarted without requiring a system reboot and finishing the task. | | |
| | ***a)*** | **Describe** the system structure and the mechanism type of the above operating system mentioning the scenarios. | **[Marks-4+4]** | **CLO-1** ***Level-1*** |
| | ***b)*** | **State** the Dual mode of an operating system. | **[Marks-2]** | |
| **2.** | ***a)*** | **Demonstrate** the transition of state of the process "compilation" from the above scenario. | **[Marks-4]** | **CLO-2** ***Level-3*** |
| | ***b)*** | **Apply** the SRTF and Preemptive Priority Scheduling (Low value = High Priority) algorithms considering the scenario and calculate the average waiting time. **Determine** the best performed algorithm for this scenario. | **[Marks-7]** | |

| PID | Arrival Time | Burst Time | Priority |
|---|---|---|---|
| P1 | 4 | 6 | 2 |
| P2 | 0 | 2 | 6 |
| P3 | 5 | 5 | 0 |
| P4 | 3 | 7 | 4 |
| P5 | 6 | 3 | 1 |

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c)

| PID | Arrival Time | Burst Time |
|---|---|---|
| P1 | 4 | 8 |
| P2 | 2 | 6 |
| P3 | 1 | 7 |
| P4 | 4 | 5 |
| P5 | 3 | 7 |

**Apply** the scheduling algorithm for the above scenario to find out the average waiting time and turnaround time, where the processor will get a maximum 2 second at a stretch.

[Marks-4]

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