



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]																									
<table border="1"> <thead> <tr> <th>PID</th><th>Arrival Time</th><th>Burst Time</th><th>Priority</th></tr> </thead> <tbody> <tr> <td>P1</td><td>4</td><td>6</td><td>2</td></tr> <tr> <td>P2</td><td>0</td><td>2</td><td>6</td></tr> <tr> <td>P3</td><td>5</td><td>5</td><td>0</td></tr> <tr> <td>P4</td><td>3</td><td>7</td><td>4</td></tr> <tr> <td>P5</td><td>6</td><td>3</td><td>1</td></tr> </tbody> </table>		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	<u>SJF</u> → <u>Performer</u>	
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A/P/

c)

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

[Marks-4]

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.