



Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Midterm Examination, Fall 2024

Course Code: SE 232; Course Title: Operating System & System Program
Sections & Teachers: 40(A-I), BH, IS, SSD

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.	<p>You are the lead systems architect at QuantumTech, a company that's developing a new class of smart drones. These drones are equipped with sophisticated hardware, including <u>real-time image processing units</u>. The drones operate on a custom-built, <u>real-time operating system</u> that employs dual-mode operation to manage system resources and handle critical tasks such as <u>flight control</u>, <u>real-time image processing</u>, and <u>communication with ground stations</u>.</p>																														
	a) Describe how the dual-transition mode of an operating system works for the task.	[Marks-5]	CLO-1 Level-1																												
	b) State how many queues are maintained to represent the process scheduling?	[Marks-5]																													
2.	a) You're a software developer working on a new project, simultaneously using your computer for <u>multiple tasks</u> . Each task gets enough fixed CPU time to function smoothly. Demonstrate the operating system of your work environment.	[Marks-5]	CLO-2 Level-3																												
	<table><tr><th>PID</th><th>Arrival Time</th><th>Burst Time</th><th>Priority</th></tr><tr><td>P1</td><td>0</td><td>4</td><td>5</td></tr><tr><td>P2</td><td>1</td><td>5</td><td>2</td></tr><tr><td>P3</td><td>2</td><td>2</td><td>1</td></tr><tr><td>P4</td><td>3</td><td>1</td><td>5</td></tr><tr><td>P5</td><td>4</td><td>6</td><td>4</td></tr><tr><td>P6</td><td>6</td><td>3</td><td>3</td></tr></table>	PID		Arrival Time	Burst Time	Priority	P1	0	4	5	P2	1	5	2	P3	2	2	1	P4	3	1	5	P5	4	6	4	P6	6	3	3	
PID	Arrival Time	Burst Time		Priority																											
P1	0	4		5																											
P2	1	5	2																												
P3	2	2	1																												
P4	3	1	5																												
P5	4	6	4																												
P6	6	3	3																												
	b) Apply the Round Robin CPU Scheduling algorithm (quantum=2) considering the scenario and calculate the average waiting time and turnaround time.	[Marks-5]																													
	c) Apply the preemptive version of the scheduling algorithm based on priority for the above scenario to find out the average waiting time and turnaround time. (High Priority = 1)	[Marks-5]																													