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Daffodil International University

Department of Software Engineering

Faculty of Science & Information Technology

Midterm Examination, Fall 2025

Course Code: SE 232; Course Title: Operating System & System Program

Sections & Teachers: 42, IS(A-C), FJT(D,E,K), SBM(F,G), RBG(H,I), PS(J)

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. You are listening to music, downloading a file and editing a document all at once and none of these tasks interface with each other. Each Program seems to get its own fair share of CPU time. Behind the scenes, when the system boots only a very small portion of operating system loads into the kernel space, interestingly failure in one part doesn't crash the whole system, yet all these tasks seem to run smoothly.

a) **Describe** the system structure and the mechanism type of the above operating system mentioning the scenarios. [Marks-3+3] CLO-1 *Level-1*

b) **State** the scheduling queues of the process. [Marks-4]

2. *a)* **Demonstrate** the concept of a model where the multiple user thread mapped to fewer kernel threads. [Marks-3] CLO-2 *Level-3*

b) [Marks-6]

PID	Arrival Time	Burst Time
P1	0	4
P2	3	1
P3	2	2
P4	1	5
P5	6	3
P6	4	6

Apply the Round Robin algorithm to find the average waiting time where quantum value, Q=2.

c) Suppose the quantum value Q is set very large, **Apply** the scheduling algorithm to find the average waiting time which it begins to resemble under this condition mentioning its effect on the short processes. **Compare** the performance of these two algorithms. [Marks-6]