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Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Midterm Examination, Fall 2026

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

Sections & Teachers: 44(A-J), IS(A-C), FJT(D, E), KM(F,G), SMR(H, I), FMD(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.		A university computer laboratory has 40 computers connected through a network to a central server. Each computer has its own operating system and can run applications independently. Students can log in from any authorized computer to access files stored on the server and use shared printers. The laboratory administrator manages user accounts, shared folders, printers, and access permissions from the server. It has been structured in such a way that network device drivers can run as separate processes, improving reliability, but communication overhead may increase.		
	a)	**Describe** the system structure and **Identify** the characteristics of the operating system demonstrated in the given scenario.	**[Marks-4 +4]**	**CLO-1** *Level-1*
	b)	**State** one of the system calls for creating a child process.	**[Marks-2]**	

2.	***a)***	Process Scheduler selects among the available processes where to go, One scheduler is used to control the degree of multiprogramming. To improve the execution process can be divided in threads. Consider the following pseudo-code program block:
		
		`for (int i = 0; i<50; i++){`
		`  printf("Hello world");`
		`}`
		
		i) Demonstrate how you can run this program block in a thread.
		ii)Determine the characteristics of the mentioned scheduler from the scenario.
			[Marks-3 +2]	**CLO-2** *Level-3*

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b) **Apply** the preemptive version of the priority scheduling algorithm to schedule the process according to its priority value (Low value = High Priority). [Marks-5 +1]

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

i) Consider the scenario and calculate the average waiting time.
ii) **Determine** the major problem of this algorithm.

c) [Marks-4]

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

Apply the round robin scheduling algorithm for the above scenario to find out the average waiting time, where each process gets a very high quantum value.

$P_1 = 6$
$P_2 = 5$
$P_3 = 5$
$P_4 = 7$
$P_5 = 3$

P_1 P_4 P_2