



Daffodil International University

Faculty of Science & Information Technology

Department of Computing and Information System

Final Examination, Spring-2026

Course Code: CIS232 / CIS323 Course Title: Operating Systems

Section: 20_A, 20_B, R_A; Level: 2 Term: 2

Exam Duration: 2 Hours

Marks: 40

Answer ALL Questions Sequentially

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

Sl.	Question	Marks	CLO																														
1.	a) What is starvation problem in priority scheduling algorithm? How to solve it?	2	CLO1																														
	b) What do you mean by PCB? Describe the details of it.	4																															
	c) Describe the services provided by the operating system	4																															
2.	a) Paging and Swapping are two memory management strategies. How paging and swapping play an important role in OS?	2	CLO2																														
	b) What do you mean by segmentation? Sketching (draw) the logical view of segmentation to manage memory.	4																															
	c) Displaying the way of handling page fault in Operating system with a short description.	4																															
3.	<table border="1"><thead><tr><th>Process</th><th>P1</th><th>P2</th><th>P3</th><th>P4</th><th>P5</th><th>P6</th><th>P7</th><th>P8</th><th>P9</th></tr></thead><tbody><tr><td>Arrival time</td><td>1</td><td>1</td><td>2</td><td>4</td><td>6</td><td>6</td><td>7</td><td>8</td><td>8</td></tr><tr><td>Burst time</td><td>3</td><td>4</td><td>1</td><td>4</td><td>5</td><td>3</td><td>1</td><td>2</td><td>3</td></tr></tbody></table> a. Find out the average waiting time and turnaround time where time quantum = 2 b. Find out the average waiting time and turnaround time using shortest job first (Preemptive) algorithm.	Process	P1	P2	P3	P4	P5	P6	P7	P8	P9	Arrival time	1	1	2	4	6	6	7	8	8	Burst time	3	4	1	4	5	3	1	2	3	5+5	CLO3
Process	P1	P2	P3	P4	P5	P6	P7	P8	P9																								
Arrival time	1	1	2	4	6	6	7	8	8																								
Burst time	3	4	1	4	5	3	1	2	3																								
4.	a) A system has 4-page frames available in main memory for storing process pages. Using an appropriate page replacement algorithm to assess the number of page faults and page hit, considering following page reference string to enhance real-world operating system: 1, 2, 1, 8, 0, 7, 6, 3, 1, 5, 8, 0, 4, 9, 0, 20, 1, 7, 0, 5, 4, 8, 9, 4, 6, 7, 10, 2, 0	5	CLO3																														

4	b)	The processes P1 to P8 given in the table (in order) need to be placed in memory. Five memory blocks of variable sizes are available. I. In your opinion, which algorithm is best for allocating these processes into memory in terms of size and why? Explain your answer. II. Allocate the processes to these memories by using the mentioned (in above question) memory allocation algorithm and perform the memory allocation with necessary diagram. <table><tr><td>Block</td><td>M1</td><td>M2</td><td>M3</td><td>M4</td><td>M5</td></tr><tr><td>Size</td><td>100K</td><td>40K</td><td>250K</td><td>70K</td><td>300K</td></tr></table> <table><tr><td>Process</td><td>P1</td><td>P2</td><td>P3</td><td>P4</td><td>P5</td><td>P6</td><td>P7</td><td>P8</td></tr><tr><td>Size</td><td>70</td><td>245</td><td>15</td><td>280</td><td>260</td><td>90</td><td>150</td><td>190</td></tr><tr><td>Turn</td><td>2</td><td>3</td><td>1</td><td>1</td><td>4</td><td>2</td><td>3</td><td>2</td></tr></table>	Block	M1	M2	M3	M4	M5	Size	100K	40K	250K	70K	300K	Process	P1	P2	P3	P4	P5	P6	P7	P8	Size	70	245	15	280	260	90	150	190	Turn	2	3	1	1	4	2	3	2	2+3	CLO3
Block	M1	M2	M3	M4	M5																																						
Size	100K	40K	250K	70K	300K																																						
Process	P1	P2	P3	P4	P5	P6	P7	P8																																			
Size	70	245	15	280	260	90	150	190																																			
Turn	2	3	1	1	4	2	3	2																																			