Daffodil International University
Faculty of Science & Information Technology
Final Examination, Fall 2023
Course Code: CSE 323: Course Title: Operating Systems
Level: 3   Term: 2   Batch: 59

Time: 2:00 Hrs   Marks: 40

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

1.	Consider a system with a page reference string of length 10: 4, 7, 1, 7, 3, 2, 9, 7, 5, 1. Assume that the system has a memory of size 3 frames. Use the FIFO, LIFO, and Optimal page replacement algorithms to determine the number of page faults generated by each algorithm. Calculate and compare the page fault counts for the given page reference string.	10 CO3

2. a) Consider the following resource allocation graph and find out whether it shows the deadlock or not? If deadlock then describe the reason if not then show the finishing sequence of the processes and explain it.   5   CO4
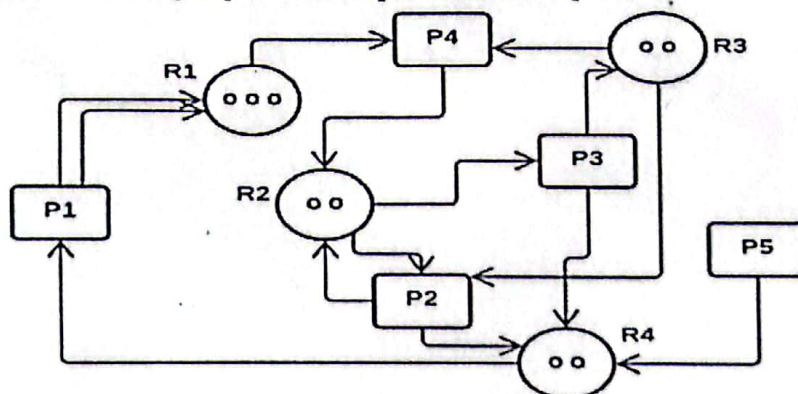
b) Assume that there are 6 processes; P1, P2, P3, P4, P5, P6. You decide to execute these processes in such a way that deadlock will not occur. Now see the following snapshot and give the answer to the following questions   10

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P1	0	2	3	2	1	6	7	2	2	3	2	0
P2	1	1	3	2	2	2	5	2				
P3	1	0	0	0	2	0	5	0				
P4	0	4	2	2	0	6	5	2				
P5	2	0	1	0	3	6	5	6				
P6	2	0	2	1	4	9	9	6				

I.   Find out the content of the **Need** of each process.
II. Find out the safe sequence of the above scenario.
III. Suppose one request from process P5 for (1, 5, 1 and 1) resources arrives. Can the request be granted immediately ensuring the system is safe? If yes, show the necessary update. If not, explain it.

3. a) The processes P₁ to P₉ given in the table (in order) need to be placed in memory. Five memory blocks of variable sizes are available. Given memory partitions of **100K, 300K, 50K, 150K, and 20K (in order)**, how would **First fit** and **Best Fit** algorithm place each of the processes P₁ to P₉ given in the table (in order)? Show with necessary Diagram.   10   CO3

Process	Size	Turnaround
P₁	90k	2
P₂	100k	1
P₃	50k	1
P₄	200k	2
P₅	15k	2
P₆	10k	1
P₇	105k	1
P₈	280k	1
P₉	35k	3

b) Explain Paging concept with all the pages and frames created in the question number 1.   5

All the best!