Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Final Exam, summer 2021 @ DIU Blended Learning Center

Course Code: CSE323 (Day), Course Title: Operating Systems

Level: 3 Term: 2 Section: PC-A, and PC-B

Instructor: Md. Sabab Zulfiker Modality: Open Book Assessment

Date: Thursday 26 August, 2021 Time: 1:30 PM-05:00PM

Three and half hours (3:30) to support online open/case study based assessment

Marks: 40.0

Analyze and answer specific sections based on your own thinking and work.
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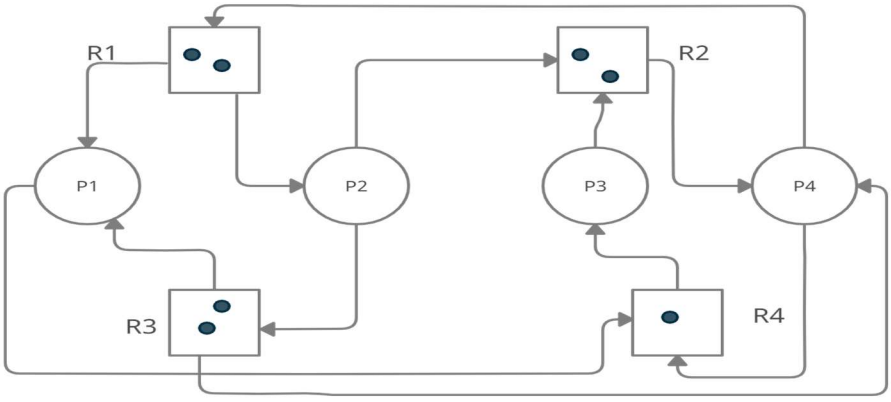
		Answer all of the questions.	
1	**a.**	Consider the following resource allocation graph and find out whether it shows the deadlock or not? If Deadlock then describe the reason if not then show the finishing sequence of the processes and explain it.  	**5.0**
	b.	Suppose, you have some processes P0, P1, P2, P3, P4, P5. You decide to execute those processes in such a way that deadlock will not occur. They need four types of resources: A, B, C, and D. Your system has 3 instances of A, 3 instances of B, 5 instances of C and 4 instances of D available at the initial state. You have those resources and need more resources to complete your task In the Allocation and Maximum column **the value for B and C** for process P3 will be **the last two digits of your own DIU ID.** **For example,** if your ID is ID 201-15-15359, then the value for B=5 and C=9. You have to do the similar for your own DIU ID to find out the value for B and C in the Allocation and Maximum column of P3.	**7.0**

Now see the following snapshot and give the answer to the following questions.

Processes	Allocation				Maximum			
	A	B	C	D	A	B	C	D
P0	2	1	1	0	4	5	5	2
P1	3	0	0	1	5	0	5	2
P2	2	2	3	4	5	3	6	4
P3	1			0	3			4
P4	1	2	3	1	3	6	5	1
P5	1	0	0	0	4	1	2	5

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 P4 for (4, 1, 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.

2 **a.** 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. In your opinion, which algorithm is best for allocating these processes into memory in terms of size? Why? Explain your answer. Allocate the processes to these memories by using this memory allocation algorithm and show this with necessary diagrams. **6.0**

Block	M1	M2	M3	M4	M5
Size	100K	50K	300K	70K	190K

Processes	**Size**	**Turnaround**
P1	100K	1
P2	50K	3
P3	250K	2
P4	10K	2
P5	35K	1
P6	180K	2
P7	200K	T+1
P8	95K	T+2

		Here, T= **Your mobile no % 2**	
	b.	Consider the following segment table: **Segment** | **Base** | **Length** 0 | 2400 | 600 1 | 2300 | 50 2 | 1000 | 200 3 | 1270 | 480 4 | 1980 | 90 Draw the flowchart for converting Logical Address to Physical Address and identify the location of the physical addresses in main memory for the following logical addresses a. 0,820 b. 1,20 c. 2,50 d. 4,95 e. 3,350	**4.0**
3		A system has 4 page frames available for storing process pages in main memory; which is given bellow. 6 7 It uses the FIFO page replacement policy. What is the page fault ratio and hit ratio that will occur while processing the page reference string given below: 1, 6, 3, 5, 4, 7, 2, 3, 1, 2, 5, 1, 7, 2, 4, 3, 5, 6, A1, A2, A3, A4 Where A1, A2, A3 and A4 are the last four digits of your ID. **For example,** if a student has ID 171-15-2345, then A1=2, A2=3, A3=4 and A4=5 Now, Calculate the page fault ratio and hit ratio for Optimal Algorithm too and compare it with the FIFO page replacement algorithm.	**9.0**
4	**a.**	What are the goal(s) for process scheduling? How does a medium term scheduler help to accomplish those goals? Illustrate your answer with a scenario.	**4**
	b.	Can First Fit and Best Fit algorithms suffer from External Fragmentation? Give reasons with example behind your explanation. Among the First Fit, Best Fit and Worst Fit algorithms which is the worst victim of internal fragmentation? Give reasons with example behind your explanation.	**5**

Best of Luck ☺