COMSATS University Islamabad, Lahore Campus

(Defence Road, Off Raiwind Road, Lahore)

☐ **Midterm Exam** ■ **Terminal Exam – Spring 2024**

Course Title:	Operating Systems – Lab	Course Code:	CSC-322	Credit Hours:	3(2,1)
Course Instructor/s:	M Mudassar	Programme Name:	BCS, BSSE, BCE		
Semester:	Batch:	Section:	[redacted]	Date:	May 30, 2024
Time Allowed:	180 Minutes	**Maximum Marks:**			50
Student's Name:	[redacted]	Reg. No.	[redacted]		

Important Instructions / Guidelines:

- Read the question statement, note, and marks distribution carefully.

Question-01: **[Marks: 25]**

CLO:7; Bloom Taxonomy Level: Applying

Write a C or C++ program that takes total memory size from the user along with number of partitions, size of each partition, number of processes, and size of memory required for each process. Make sure that the sum of all required memory partitions must not exceed the total available memory size. The program must be able to assign the memory to the processes in the available memory partitions (created by user) and shows which process got allocated to which memory partition and which is not allocated to any memory partition. Further it shows the internal fragment and external fragment.

One possible Sample Output (End Result):

PROCESS	MEMORY REQUIRED	ALLOCATED	INTERNAL FRAGMENTATION
1	275	YES	25
2	100	NO	-----
3	290	YES	10
4	293	YES	7

Memory is Full. Remaining Processes cannot be accommodated Total Internal Fragmentation is 42
Total External Fragmentation is 100

Question-02: **[Marks: 25]**

CLO:7; Bloom Taxonomy Level: Applying

Write a C or C++ program that implements the concept of Priority CPU Scheduling Scheme. The program must ask the number of processes, their burst time, priority number, and the type of process from the user (as given in a sample table).

There are three types of processes such as System Processes (SP), Interactive Processes (IP), and Batch Process (BP) in the queue. System processes have higher priority than interactive

processes, and interactive processes have higher priority than batch processes. If there are two or more than two same types of processes having different priority numbers, then the process having higher the priority number would be executed first. It means that the process that has higher the priority number has higher the priority.

Sample Table of Processes

Processes	Process Type	Priority	Burst Time
P1	SP	3	5
P2	BP	7	6
P3	SP	5	9
P4	IP	9	5
P5	BP	4	3
P6	SP	6	2
P7	IP	8	7
P8	BP	1	1
P9	IP	2	4
P10	SP	4	6

Do your own work, some One is watching.

Best of luck!