



COMSATS UNIVERSITY ISLAMABAD
DEPARTMENT OF COMPUTER SCIENCE
Mid-Term Examination, Spring 2022

Class: - BSCS-4, BSSE-4
 Subject: - Operating Systems (CSC322)
 Dated: - May 09, 2022

Marks: -25
 Time: - 1.0 Hours

Name: _____ Reg # FA20-_____

Question 1

CLO- 1

Marks [5+5+10]

Part 1: Explain the impact of Direct-Memory-Access on memory operations. (5)

Part 2: Suppose you are designing an OS and you have to make it sure that OS never gets out of control of the system. Design a mechanism and policies for this problem and choose your policy. (5)

Part 3: Explain and compare the Layered and Modular approaches for structuring the OS. (10)

Question 2

CLO- 2

Marks [15+5+5+5]

Part 1: Suppose there are 7 processes that enter the system at different times and demand the CPU for their execution. Detail of these processes is provided below.

Process	Name	Type	Arrival Time	Priority	Burst Time
P ₁	OS update	Background	0	NORMAL	90s
P ₂	Antivirus update	Background	1	NORMAL	80s
P ₃	Network update	Background	2	NORMAL	50s
P ₄	MS-Paint	Foreground	3	HIGH	30s
Interrupt			4	HIGH	2s
P ₅	MS-WORD	Foreground	10	MEDIUM	15s
Interrupt			11	HIGH	2s
P ₆	Printer	Foreground	12	MEDIUM	20s
Interrupt			13	HIGH	2s
P ₇	C program	Foreground	20	LOW	10s

Provide a complete Gantt chart showing the scheduling of these processes using the SJF algorithm. Also find the average waiting time. (15)

Part 2: Differentiate Concurrency and Parallelism. Define different types of parallelism. (5)

Part 3: What are the necessary conditions for a correct solution to critical-section problem. (5)

Part 4: What is the difference between a normal integer and a semaphore? Which type of semaphore works like mutex (Explain)? (5)