



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

Marks: - 25
Time: - 1.5 Hours

Class: - BSCS-4, BSSE-4
Subject: - Operating Systems (CSC322)
Dated: - November 19, 2022

Name: _____ Reg # _____

Marks [3+3+4=10]

Question 1

CLO- 1: Elaborate concepts and principles of operating systems.

Part 1: Explain the following terms and their objectives: multi-programming, multi-tasking; and multi-processing. (3)

Part 2: Why dual-mode operation is required in Operating Systems? What is the role of system-calls in dual-mode operation? (3)

Part 3: What is the mechanism-policy principle for designing an OS? Explain the micro-kernel approach for structuring an OS along with its advantages and disadvantages. (4)

Marks [2+2+3+5+3=15]

Question 2

CLO- 2: Analyze various operations performed by operating system for process management.

Part 1: Suppose an OS uses rendezvous communication in message-passing service. Then how much buffering is required to implement this service (Explain) (2)

Part 2: Some operating systems uses a medium-term scheduler for managing processes. What is this scheduler and why it is required? (2)

Part 3: If during the execution one thread is blocked then what will be its impact on other threads under the following models (give reasons as well): many-to-one, one-to-one and many-to-many (3)

Part 4: Consider the following set of processes given in the following table. Draw a Gantt chart showing their execution using the SJF preemptive scheduling. Also find the waiting time of process P3 and P4. (5)

Process ID	Burst Time	Arrival Time
P0	8	2
P1	10	0
P2	6	4
P3	12	5
P4	12	6
P5	2	7
P6	6	8
P7	2	10

Part 5: Consider the methods used by processes P1 and P2 for accessing their critical sections whenever needed, as given below. The initial values of shared Boolean variables S1 and S2 are randomly assigned.

Method Used by P1	Method Used by P2
while (S1 == S2) ; Critical Section S1 = S2;	while (S1 != S2) ; Critical Section S2 = not (S1);

Keeping in mind the methods used by both processes, figure out why process p1 cannot re-enter its critical section immediately after executing once in its critical section. (3)