



COMSATS University Islamabad

Department of Computer Science

Mid Term Examination – Fall 2024

Class: (BS) CS/SE/IT/CYS/DS

Semester: 5th

Course Code & Title: CSC323 Principles of Operating Systems Date: 8-10-2024

Time Allowed: 1.5 hrs

Max Marks: 25

Instructors: Mr. Haris, Ms. Madiha, Ms. Ayesha, Ms. Zahida, Dr. Memoona

Name: _____

Registration # _____

CLO1

Marks [4+3+4]

CLO1 : Elaborate concepts and principles of operating systems.

Q1) Discuss at least four different computing environments and the diverse role of operating systems in their varied conditions.

Q2) Explain the use of direct memory access (DMA) controller?

Q3) Hybrid kernels are better than monolithic and micro kernels. Justify the statement.

CLO- 2

Marks [7+3+2+2]

CLO2: Analyze various operations performed by operating system for process management.

Q4) Suppose, in an OS multilevel-feedback queue scheduling is implemented. There are three queues to hold the ready processes. In Q1, RR scheduling algorithm is used to schedule processes (quantum is 6, assigned on FCFS basis). While in Q2 and Q3, priority-based scheduling and SJF preemptive scheduling is used respectively. When a process arrives, it is kept in Q1. If a process in Q1, does not complete in one quantum it is moved to Q2 if its priority is less 10 otherwise it is sent to Q3. When the Q1 gets empty, processes from Q2 are executed and then Q3 processes are executed. Considering this scheduling system, draw a Gantt chart showing the execution order of the following processes.

Process ID	Priority	Burst Time	Arrival Time
P0	12	4	0
P1	8	24	3
P2	16	15	1
P3	24	14	6
P4	6	18	2

P5	4	12	4
P6	20	14	5
P7	1	12	7

Note: Smaller priority number means higher priority

Q5: Analyze and illustrate examples of data-level and task-level thread parallelism with a corresponding Gantt charts.

Q6: Analyze how Process Control Blocks (PCBs) assist the CPU in managing context switching when an interrupt occurs.

Q7: Analyze how the main memory block is allocated to a new process during its creation.