



Department of Computer Science and Engineering

Program: BE

Date	17.12.2025	Maximum Marks	65
Course Code	CS235AI	Duration	120 Min
Sem	III	CIE - II	

OPERATING SYSTEMS
(Common to CSE/CD/CY/ISE)

Sl. No.	Quiz Questions	M	L	CO
1	Why does FCFS scheduling suffer from the convoy effect?	2	L2	CO2
2	Identify the drawbacks of spinlocks	2	L2	CO2
3	In Readers-Writers problem, what Does if (readcount == 1) Achieve? if (readcount == 1) sem_wait(&wrt);	2	L3	CO2
4	List two types of semaphores with an example for each.	2	L1	CO1
	What is the value of s after execution? sem_t s; sem_init(&s, 0, 3);			
5	sem_wait(&s); sem_wait(&s); sem_post(&s); sem_wait(&s);	2	L3	CO4

Sl. No.	Test Questions	M	L	CO																								
1	Consider the following set of processes with a length of the CPU burst time given in milliseconds <table border="1"> <thead> <tr> <th>Process</th> <th>Arrival Time</th> <th>Burst Time</th> <th>Priority</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>0</td> <td>11</td> <td>2</td> </tr> <tr> <td>P2</td> <td>5</td> <td>28</td> <td>0</td> </tr> <tr> <td>P3</td> <td>12</td> <td>2</td> <td>3</td> </tr> <tr> <td>P4</td> <td>2</td> <td>10</td> <td>1</td> </tr> <tr> <td>P5</td> <td>9</td> <td>16</td> <td>4</td> </tr> </tbody> </table> Draw Gantt charts illustrating the execution of these processes using Preemptive SJF, Preemptive Priority and Round Robin (Time slice=2ms). Compute the average waiting time, average turn around time and number of context switches in each approach.	Process	Arrival Time	Burst Time	Priority	P1	0	11	2	P2	5	28	0	P3	12	2	3	P4	2	10	1	P5	9	16	4	10		
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2a	Illustrate the various scheduling criteria for comparing CPU scheduling algorithms	6	L2	CO2																								

2b	Discuss Peterson's solution to the critical section problem	4	L1	CO1
3a	Write the pseudocode and the use of TestAndSet() and CompareAndSwap() hardware based synchronization primitives	6	L3	CO4
3b	Write the structure of a reader process in first readers writers problem using semaphores	4	L3	CO3
4a	Write the general structure of a process for critical section. Identify the requirements for the solution to a critical section problem	7	L2	CO1
4b	Differentiate between pre-emptive and non-preemptive scheduling	3	L2	CO2
5	With a suitable example explain race condition. Write a multithreaded program to solve producer consumer problem using Semaphores.	10	L3	CO5

Course Outcomes

CO 1	Demonstrate the fundamental concepts of operating system like process management, file management, memory management and issues of synchronization.
CO 2	Analyze and interpret operating system concepts to acquire a detailed understanding of the course.
CO 3	Apply the operating systems concepts to address related new problems in computer science Domain.
CO 4	Design or develop solutions to solve applicable problems in operating systems domain.
CO5	Extend the theoretical knowledge acquired through the course to demonstrate skills like investigation, effective communication, working in team/Individual, following ethical practices by implementing operating system concepts/applications and engage in lifelong learning.

Blooms' taxonomy

L1	L2	L3	L4	L5	L6	CO1	CO2	CO3	CO4	CO5	CO6
06	20	34				13	15	14	8	10	