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Enroll No.

LNCTU

Class Roll No.....

I- Mid Semester Exam October 2024

Branch: CSE/AIML Semester: III

CS-302/AL-302

OPERATING SYSTEM

Time 1:30 Hrs

Max. Marks 20

Note: All questions are compulsory and have internal choice.

Ques.1: What is Operating System? Explain different types of Operating System with example. (CO1 5 Marks)

OR

What is process state? Explain process state transition diagram.

Ques.2: What is Process Control Block? Give the difference between a process and a program. (CO1 5 Marks)

OR

Consider the set of processes whose arrival time and burst time are given below:

Process	Arrival Time	Burst Time
P ₀	0	3
P ₁	1	6
P ₂	2	2
P ₃	3	7
P ₄	4	4

Develop a Gantt Chart and calculate the Average waiting time & average turnaround time using: a. FCFS b. SJF c. ROUND ROBIN (TIME QUANTUM = 2)

Ques 3: What do you mean by Deadlock Avoidance? Explain the use of Banker's Algorithm for Deadlock Avoidance with illustration. (CO2 5 Marks)

OR

What is Deadlock? List the conditions that lead to deadlock. How Deadlock can be prevented?

Ques 4: What is Race condition? Explain Producer Consumer problem. (CO2 5 Marks)

OR

Consider a system that contains five processes P₁, P₂, P₃, P₄, P₅ and the three resource types A, B and C. Following are the resources types: A has 10, B has 5 and the resource type C has 7 instances

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P ₁	0	1	0	7	5	3	3	3	2
P ₂	2	0	0	3	2	2			
P ₃	3	0	2	9	0	2			
P ₄	2	1	1	2	2	2			
P ₅	0	0	2	4	3	3			

Answer the following questions using the banker's algorithm:

1. What is the reference of the need matrix?
2. Determine if the system is safe or not.