

Name:	Printed
Student University Roll No.:	Pages: 1
School of Engineering 1st Sessional Examination, Even Semester (AS: 2023-24) B. Tech: CSE, CSE-AI, CSE-CCML, CSE-IOTBC	
Year: 2 nd	Semester: 4 th
Course Title: Operating System	M.M.: 30
Course Code: BCS 3402	Time: 1 hr

Instructions if any: Read the question Carefully.

SECTION 'A'		Course Objective	Mark s															
Q.N.1. Attempt all parts of the following:																		
a)	Define the Operating System and the services provided by the operating system.	CO1	1															
b)	Write a short note on SPOOLING.	CO1	1															
c)	Explain the Process Synchronization.	CO2	1															
d)	Differentiate between User address space and Kernel address space.	CO1	1															
e)	How do you recover a system from deadlock?	CO2	1															
SECTION 'B'		Course Objective	Marks															
Q.N.2. Attempt any two parts of the following:																		
a)	Define Deadlock. List four necessary conditions for the occurrence of deadlock.	CO2	7.5															
b)	Write and explain Peterson's solution to the Critical Section Problem.	CO2	7.5															
c)	Consider the following processes:	CO1	7.5															
	<table><tr><td>PROCESS</td><td>ARRIVAL TIME</td><td>BURST TIME</td></tr><tr><td>P1</td><td>0</td><td>8</td></tr><tr><td>P2</td><td>1</td><td>4</td></tr><tr><td>P3</td><td>2</td><td>9</td></tr><tr><td>P4</td><td>3</td><td>5</td></tr></table>			PROCESS	ARRIVAL TIME	BURST TIME	P1	0	8	P2	1	4	P3	2	9	P4	3	5
	PROCESS			ARRIVAL TIME	BURST TIME													
	P1			0	8													
	P2			1	4													
	P3			2	9													
P4	3	5																
Draw a Gantt Chart and find the Average Waiting Time and Average Turnaround Time using SRTF Scheduling.																		

d)	What do you mean by Process? Explain the Process State Diagram.	CO1	7.5
SECTION 'C'			
Q.N.3. Attempt any one part of the following		Course Objective	Marks
a)	State and describe the Dining Philosopher Problem with its suitable solution using Semaphores.	CO2	10
b)	Consider the following snapshot of the system:	CO2	10
	PROCESS ALLOCATED MAX NEED AVAILABLE		
	R1 R2 R3 R1 R2 R3 R1 R2 R3		
	P1 2 2 3 3 6 8 2 3 0		
	P2 2 0 3 4 3 3		
	P3 1 2 4 3 4 4		
	Answer the following question using the banker's algorithm: i) What is the content of matrix NEED? ii) Is the system in a safe state? If yes, then also write the safe sequence.		
c)	What is PCB? List of various criteria for measuring the performance of scheduling algorithms.	CO1	10

Table 1: Mapping between Cos and questions

(Number of Cos may vary from course to course)

Cos	Questions Numbers	Total Marks
CO1	1(a, b, d), 2(c, d), 3(c)	28
CO2	1(c, e), 2(a, b), 3(a, b)	37