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

Instructions if any: Read the question Carefully.

	SECTION 'A' Q.N.1. Attempt all parts of the following:	Course Objective	Marks
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' Q.N.2. Attempt any two parts of the following:	Course Objective	Marks
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: 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.	CO1	7.5

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: 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.	CO2	10
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