Printed page: 02 **Subject Code: ACSBS0403**

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P. J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

Course B.Tech Branch CSBS

Semester IV **Sessional Examination-II** **Year- (2021 - 2022)**

Subject Name: OPERATING SYSTEM

Time: 1.15 Hours **[SET- B]** **Max. Marks:30**

General Instructions:

- This Question paper consists of 2 pages & 5 questions. It comprises of three Sections, A, B, and C
- **Section A** -Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each. You are expected to answer them as directed.
- **Section B -** Question No-3 is Short answer type questions carrying 5 marks each. Attempt any two out of three questions given.
- **Section C** - Question No. 4 & 5are Long answer type (within unit choice) questions carrying 6 marks each. Attempt any one part *a* or *b*.

		SECTION – A	[08Marks]	
1.	**All questions are compulsory**		(4×1=4)	
	a.	What is a medium-term scheduler? 1) It selects which process has to be brought into the ready queue 2) It selects which process has to be executed next and allocates CPU 3) It selects which process to remove from memory by swapping 4) None of the mentioned	(1)	CO2
	b.	Consider the following three processes in the FCFS Process ID. Brust-time. Arrival-time P1 3 3 P2 6 6 P3 9 9 What is the average waiting time? 1) 3 2) 2 3) 4 4) 1.2	(1)	CO2
	c.	Which algorithm is defined in Time quantum? 1) banker's algorithm 2) round-robin algorithm 3) elevator algorithm 4) karn's algorithm	(1)	CO3
	d.	What are the two kinds of semaphore? 1) binary and counting 2) mutex and counting 3) mutex and Binary 4) none of the mentioned	(1)	CO3
2.	**All questions are compulsory**		(2×2=4)	

	a.	Define Critical Section and Binary Semaphore.	(2)	CO3
	b.	Define Response and Thread	(2)	CO2
		SECTION – B	[10Marks]	
3.		**Answer any two of the following-**	(2×5=10)	
	a.	Explain the differences between Long-term and short-term scheduler. (At least 5)	(5)	CO2

	b.	The following two functions P1 and P2 that share a variable B with an initial value of 2 execute concurrently-
		P1()
		{
		C = B -1;
		B = 2 × B;
		}
		P2()
		{
		D = 2 × B;
		B = D -1;
		}
		If B initialize with 2, then find number of distinct values
			(5)	CO3

	c.	Explain Deadlock Avoidance and conditions necessary for deadlock.	(5)	CO3
		SECTION – C	[12Marks]	
4		**Answer any one of the following-**	(1×6=6)	
	a.	All five processes arrive at time 0, in the order given, with the length of the CPU burst given in milliseconds: Process Burst Time P1 10 P2 29 P3 3 P4 7 P5 12 Consider the FCFS, SJF and RR (quantum = 10 milliseconds) scheduling for this set of processes. Which algorithm would give the minimum average waiting time?	(6)	CO2
	b.	Explain Earliest-Deadline-First Scheduling with an example.	(6)	CO2
5.		**Answer any one of the following-**	(1×6=6)	
	a.	Consider the following snapshot of a system: **Allocation Max Available** **A B C D A B C D A B C D** P0 0 0 1 2 0 0 1 2 1 5 2 0 P1 1 0 0 0 1 7 5 0 P2 1 3 5 4 2 3 5 6 P3 0 6 3 2 0 6 5 2 P4 0 0 1 4 0 6 5 6 Answer the following questions using the banker's algorithm 1) What is the content of the matrix Need? 2) Is the system in a safe state? If yes then what is the safe sequence?	(6)	CO3
	b.	Why is deadlock state more critical than starvation? Describe resource allocation graph with a deadlock, with a cycle but no deadlock.	(6)	CO3