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Subject Code: ACSE0403A / ACSE0403B

Roll No: | | | | | | | |

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY ,GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech (CSE, IT, AIML,AI,DS,CS, IOT)

(SEM:IV SESSIONAL EXAMINATION –II) (2021-2022)

Subject Name: Operating Systems

Time: 1.15Hours **Max. Marks:30**

[Set – B]

General Instructions:

- This Question paper consists of 3 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		
1.		**Attempt all parts**	[8]	
	a.	Control of the CPU to the process selected by the short-term scheduler is assigned by the module_____. a) interrupt b) scheduler c) dispatcher d) none of the mentioned	(4×1=4) (1)	CO CO2
	b.	In multilevel feedback scheduling algorithm a) a process can move to a different classified ready queue b) classification of ready queue is permanent c) processes are not classified into groups d) none of the mentioned	(1)	CO2
	c.	If no cycle exists in the resource allocation graph a) then the system will not be in a safe state b) then the system will be in a safe state c) all of the mentioned d) none of the mentioned	(1)	CO3
	d.	A solution to the problem of indefinite blockage of low – priority processes is _____ a) Starvation	(1)	CO2

		b) Wait queue c) Ready queue d) Aging		
2.		**Attempt all parts**	(2×2=4)	CO
	a.	What is starvation? Explain with example.	(2)	CO2
	b.	Define deadlock? Write down the necessary conditions to hold a deadlock in a system?	(2)	CO3
		SECTION – B		
3.		**Answer any two of the following-**	[2×5=10]	CO
	a.	Differentiate between the multilevel queue and multilevel feedback queue scheduling with their advantages and disadvantages?	(5)	CO2
	b.	Write in detail about deadlock avoidance and Bankers algorithm in detail.	(5)	CO3
	c.	What are the difference between process and thread? Explain the types of thread with their advantages and disadvantages.	(5)	CO2
		SECTION – C		
4		**Answer any one of the following-**	[2×6=12]	CO
	a.	Let us Consider the following set of five processes, with the length of CPU burst time given in milliseconds:-	(6)	CO2

ProcessName	Arrival Time	CPU Burst Time
P1	3	8
P2	2	5
P3	0	7
P4	1	4
P5	4	2

Draw the Gantt chart, calculate the average waiting time and turnaround time using the Round Robin CPU scheduling algorithm. (Given Time Quantum= 2 Milliseconds).

	b.	Let us consider the following snapshot:-	(6)	CO3

Process	Allocation				Maximum				Available			
	R1	R2	R3	R4	R1	R2	R3	R4	R1	R2	R3	R4
P1	0	0	1	2	0	0	1	2	1	5	2	0
P2	1	0	0	0	1	7	5	0				
P3	1	3	5	4	2	3	5	6				
P4	0	6	3	2	0	6	5	2				
P5	0	0	1	4	0	6	5	6				

i. What is the content of need matrix?

ii. Is the system in a safe state or not, if the system is in safe state then find the safe sequence?

5.	**Answer any <u>one</u> of the following-**			
	a.	Explain Deadlock prevention in detail.	(6)	CO2
	b.	Consider the following set of four processes, with the length of CPU burst time given in milliseconds:	(6)	CO3

<u>ProcessName</u>	<u>Arrival Time</u>	<u>CPU Burst Time</u>	<u>Priority</u>
P1	1	5	3
P2	0	6	4
P3	2	4	2
P4	3	7	1

Calculate the average waiting time and turnaround time by using the Pre-emptive SJF, Preemptive priority CPU Scheduling algorithms.(Given Minimum priority= 4, Maximum Priority = 1)