GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023

Subject Code:3141601   **Date:07-07-2023**

Subject Name:Operating System and Virtualization

Time:10:30 AM TO 01:00 PM   **Total Marks:70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define (i) Operating systems (ii) Tightly coupled Systems (iii) Loosely Coupled Systems.	03
	(b)	Define Process. And Write various states of process with diagram.	04
	(c)	Describe the services an Operating System provides to users, processors and other systems.	07
Q.2	**(a)**	Define Thread. And write usage of threads.	03
	(b)	Write about Process Control block.	04
	(c)	Define Scheduler. Discuss Types of Schedulers.	07
		OR	
	(c)	Write about Multithreading models.	07
Q.3	**(a)**	What is buffering? Write various types of buffers.	03
	(b)	Write about various Scheduling criteria.	04
	(c)	Explain preemptive Shortest Job First and preemptive priority scheduling algorithm with proper example and gantt chart. Example must show waiting time, turnaround time of each process. And also average waiting time and average turn around time.	07
		OR	
Q.3	**(a)**	Define Mutual Exclusion, Critical Section and Race Condition.	03
	(b)	Write Peterson's Solution for avoiding race condition.	04
	(c)	Explain how Dining philosopher problem can be solved using Semaphore.	07
Q.4	**(a)**	Discuss priority Inversion problem.	03
	(b)	Define Deadlock. And also write condition responsible for deadlock.	04
	(c)	Write Banker's Algorithm for avoiding Deadlock for allocation of multiple instances of resource type.	07
		OR	
Q.4	**(a)**	Discuss what is safe state.	03
	(b)	Write about Resource allocation graph algorithm.	04
	(c)	Explain LRU and MRU page replacement algorithm with proper example showing number of page faults for 3 frames as well as 4 frames. (one can assume page sequence as their own)	07
Q.5	**(a)**	Define Internal and External Fragmentation.	03
	(b)	Discuss paging in Detail.	04
	(c)	Explain RAID in detail.	07
		OR	
Q.5	**(a)**	Write Types of access methods.	03

(b) Discuss TLB. **04**

(c) Explain SSTF, SCAN, LOOK Disk Scheduling algorithm with proper example **07**
showing which algorithm needs to traverse less number of cylinders. (Assume
cylinder sequence as your own)

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