Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–IV EXAMINATION – WINTER 2025

Subject Code:3140702 Date:13-11-2025

Subject Name:Operating System

Time:02:30 PM TO 05:00 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)**	Explain the uses of Operating system.	**03**
	(b)	Explain multiprogramming and multiprocessing operating system.	**04**
	(c)	What is process? Explain process state transition diagram.	**07**
Q.2	**(a)**	What is thread? Explain user level and kernel level thread.	**03**
	(b)	What is critical section? Explain race condition with example.	**04**
	(c)	What is Semaphore? Solve dinning philosopher problem using semaphore.	**07**
		OR	
	(c)	What is Binary Semaphore? Solve Reader and Writer problem using semaphore.	**07**
Q.3	**(a)**	Differentiate between preemptive and non preemptive scheduling algorithm.	**03**
	(b)	Explain Principles of Concurrency with example.	**04**
	(c)	Explain Round robin scheduling algorithm with example.	**07**
		OR	
Q.3	**(a)**	Explain the scheduling criteria for a good scheduling algorithm.	**03**
	(b)	Explain segmentation with example.	**04**
	(c)	Explain Shortest Job scheduling algorithm with example.	**07**
Q.4	**(a)**	Explain page fault.	**03**
	(b)	What is deadlock? Explain the condition that leads to deadlock.	**04**
	(c)	Explain Banker algorithm for deadlock avoidance with example. 7	**07**
		OR	
Q.4	**(a)**	Explain Resource allocation graph.	**03**
	(b)	Explain different paging techniques.	**04**
	(c)	Differentiate between External Fragmentation and Internal Fragmentation.	**07**
Q.5	**(a)**	Explain major goals of I/O software.	**03**
	(b)	Differentiate between fixed and variable partitioning technique for memory management.	**04**
	(c)	Explain Disk arm scheduling algorithm.	**07**

OR

Q.5	**(a)**	Explain DMA with block diagram.	**03**
	(b)	Explain swapping in operating system.	**04**
	(c)	Explain RAID level system.	**07**

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