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

Subject Code:3140702   **Date:07-07-2023**
Subject Name:Operating System
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)	Explain any three main functions of an Operating System.	03
	(b)	Describe the features of a distributed operating system.	04
	(c)	What is a process? Explain about various fields of process control block.	07
Q.2	(a)	Define multi-threading? Explain its benefits.	03
	(b)	Describe the differences among long-term scheduling. short-term, and medium-term scheduling.	04
	(c)	Demonstrate FIFO and Round Robin CPU scheduling algorithms with suitable example.	07
		OR	
	(c)	What is semaphore? Explain its implementation as wait and signal for providing process synchronization?	07
Q.3	(a)	What are the advantages of inter-process communication? How communication takes place in a shared-memory environment?	03
	(b)	What are the conditions under which a deadlock situation may arise?	04
	(c)	Explain the readers and writers problem.	07
		OR	
Q.3	(a)	What is race condition?	03
	(b)	What are the methods for handling deadlocks?	04
	(c)	Explain the dining-philosophers problem.	07
Q.4	(a)	Explain the difference between logical and physical addresses.	03
	(b)	When do page faults occur? Describe the actions taken by the operating system when a page fault occurs.	04
	(c)	Explain Banker's deadlock-avoidance algorithm with an illustration.	07
		OR	
Q.4	(a)	Explain the following allocation algorithms:	03
		1) First-fit 2) Best-fit 3) Worst-fit	
	(b)	Explain the difference between internal and external fragmentation.	04
	(c)	Explain the different file access methods in detail.	07
Q.5	(a)	Explain domain of protection.	03
	(b)	Write a short note on: system threats.	04
	(c)	Explain in detail Synchronization implementation in Linux.	07
		OR	
Q.5	(a)	What are the main difference between capability lists and access lists?	03
	(b)	Write a short note on: program threats.	04
	(c)	What is virtualization? Explain the benefits of virtualization.	07

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