

Enrolment No./Seat No _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV EXAMINATION – SUMMER 2025

Subject Code: 3140702

Date:08-05-2025

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 in brief Program, Process and Thread.	03
(b) What is Process State? Explain different states of a process with various queues generated at each stage.	04
(c) Give the functions of Operating System and Explain following OS in detail. 1. Time Sharing 2. Real Time 3. Batch Operating System.	07
Q.2 (a) Define following with respect to CPU Scheduling Algorithms: 1. Turnaround Time 2.Waiting Time 3. Throughput	03
(b) Compare Round Robin, FCFS and Shortest Job First Algorithms for CPU Scheduling.	04
(c) What is Semaphore? Give the implementation of Readers-Writers Problem using Semaphore.	07
OR	
(c) What is Monitor? Give the implementation of Bounded Buffer Producer-Consumer Problem using Monitor.	07
Q.3 (a) What is Shell and Kernel in Unix?	03
(b) List the necessary conditions that lead to deadlock.	04
(c) Explain Banker's Algorithm for Deadlock Avoidance with illustration..	07
OR	
Q.3 (a) Give the difference between Deadlock and Starvation.	03
(b) What is Process Control Block (PCB)?Explain various entries in PCB.	04
(c) Draw the block diagram for DMA. Write steps for DMA data transfer.	07
Q.4 (a) Explain Internal and External Fragmentation in Memory Management.	03
(b) Explain the Linux/Unix Commands: cat, rmdir, sort, chmod.	04
(c) Explain FIFO, LRU and Optimal Page Replacement Algorithms with example.	07
OR	
Q.4 (a) Write a shell script to find a factorial of given number n.	03
(b) Compare Paging and Segmentation with reference to Memory Management.	04
(c) Explain various Disk Arm Scheduling Algorithms for Disk Space Management.	07
Q.5 (a) Explain difference between Security and Protection?	03
(b) What are the Allocation Methods of a Disk Space?	04
(c) Explain in Detail File and Directory Management of Unix/Linux Operating System in detail.	07
OR	
Q.5 (a) What is Access Control List?	03

- (b) Explain the concept of virtual machines and pure virtualization.
- (c) What is RAID? Explain various levels of RAID and its importance.

04
07

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: 1) First-fit 2) Best-fit 3) Worst-fit	03
	(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

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2022****Subject Code:3140702****Date:23-06-2022****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) List any four functions of operating system?	03
(b) Explain the essential properties of	04
i) Batch system ii) Time sharing	
iii) Real time iv) Distribute	
(c) Explain process states and process control block in details.	07
Q.2 (a) What are the various criteria for a good process scheduling algorithm?	03
(b) What is thread? Explain classical thread model.	04
(c) How semaphores can be used to deal with n-process critical section problem? Explain.	07
OR	
(c) What is monitor? Explain solution for producer-consumer problem using monitor.	07
Q.3 (a) Define preemption and nonpreemption.	03
(b) Explain the terms related to IPC:	04
i) Race condition ii) Critical section iii) Mutual exclusion iv) Semaphores	
(c) How does deadlock avoidance differ from deadlock prevention? Write about deadlock avoidance algorithm in detail.	07
OR	
Q.3 (a) Give the Difference between Thread and Process.	03
(b) Explain the Priority scheduling algorithm.	04
(c) How to characterize the structure of deadlock? Explain the two solutions of recovery from deadlock.	07
Q.4 (a) List out the seven RAID levels.	03
(b) Write short note on: Relocation problem for multiprogramming with fixed partitions.	04
(c) What is paging? Discuss basic paging technique in details.	07
OR	
Q.4 (a) What is the difference between logical I/O and device I/O?	03
(b) Write the first, best fit memory allocation techniques.	04
(c) Define Virtual Memory. Explain the process of converting virtual addresses to physical addresses with a neat diagram.	07
Q.5 (a) Explain access control list.	03
(b) Differentiate between Windows and Linux file system.	04
(c) Write about Least Recently Used page replacement algorithm all its variants with an example.	07

OR

- Q.5** (a) Explain domain protection mechanism. **03**
(b) Write a short note: Unix kernel. **04**
(c) Describe in detail about variety of techniques used to improve the efficiency and performance of secondary storage. **07**
