

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
