

Enrolment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
M.SC INTEGRATED - SEMESTER - VIII EXAMINATION - SUMMER 2025

Subject Code: 1380301

Date: 08-05-2025

Subject Name: Advanced 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. Use of simple calculators and non-programmable scientific calculators are permitted.**

	Marks
Q.1 (a) Define Micro Kernel and state with advantage.	03
(b) Describe the architecture of a modern operating system.	04
(c) Write a short note on concurrency models and impact on system.	07
Q.2 (a) What is a monolithic kernel? Explain in detail.	03
(b) Discuss the techniques for deadlock detection and prevention.	04
(c) Discuss various types of operating system architectures and evaluate their design trade-offs.	07
OR	
(c) Explain multithreading with an example.	07
Q.3 (a) What is a distributed system? Give one real-life example.	03
(b) Compare NFS and HDFS in terms of structure and use-cases.	04
(c) Describe fault tolerance in distributed systems with an example scenario.	07
OR	
(a) What are the key principles of distributed computing?	03
(b) Describe performance of distributed file systems.	04
(c) Discuss the architecture and working of HDFS.	07
Q.4 (a) Define hypervisor. Give its types with examples.	03
(b) Describe the key benefits of virtualization in modern operating systems.	04
(c) Compare virtual machines and containers in terms of performance, overhead, and security.	07
OR	
(a) Explain the concept of paging with a diagram.	03
(b) Explain memory allocation strategies with suitable example.	04

- (c) Describe the process of page replacement algorithms with one suitable example. **07**
- Q.5 (a)** What is the role of encryption in OS security? **03**
- (b) Describe different authentication techniques used in operating systems. **04**
- (c) Explain in detail how RAID improves fault tolerance and performance. **07**

OR

- (a) Define Access Control Lists (ACLs) with an example. **03**
- (b) What are the potential threats to an operating system and how can they be mitigated? **04**
- (c) Discuss how modern operating systems prevent unauthorized access using RBAC and ACLs. **07**
