

Seat No./Enrollment No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BCA/MCA INTEGRATED – SEMESTER 3 – EXAMINATION – SUMMER 2026

Subject Code: BC03001011

Date: 13/05/2026

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. Use of simple calculators and non-programmable scientific calculators are permitted.**

- Q.1** (a) 1. Define page fault. **07**
2. Define the term swapping.
3. What is segmentation?
4. Define the term virtual memory.
5. Define the term race condition.
6. What is internal fragmentation?
7. List any 2 Disc scheduling techniques.
- (b) Explain Evolution of Operating System. **07**
- Q.2** (a) What is operating system? What are objectives and functions of operating system? **07**
(b) What is process? Explain five state processes in operating system. **07**
- OR
- (b) Explain process control block in detail. **07**
- Q.3** (a) What is thread? Explain the types of thread with appropriate diagram. **07**
(b) What is Deadlock? List the conditions that lead to Deadlock. How can be Deadlock prevented? **07**
- OR
- Q.3** (a) Write short note on principles of concurrency. **07**
(b) What is Dining Philosophers Problem? How it can be solved? **07**
- Q.4** (a) Write short note on Mutual Exclusion. **07**
(b) Discuss paging in terms of OS. Explain address translation in paging system with figure. **07**
- OR
- Q.4**

(a) Given the following information :

07

Process	Arrival Time	Burst Time
P1	0	14
P2	1	7
P3	3	9
P4	5	2

Draw the time line and calculate the average turnaround time and average waiting time using :

1. First Come First Serve (FCFS)
2. Round Robin Algorithm (Time Quantum = 5ms)

(b) Explain Dynamic Partitioning Techniques along with its advantages and disadvantages.

07

Q.5

(a) Consider the following reference string :

07

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

Find the page faults for 3 frames using FIFO and LRU page replacement Algorithms.

(b) Explain RAID with all its levels.

07

OR

Q.5

(a) Explain File allocation methods.

07

(b) Explain direct memory access with block diagram in detail.

07

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
BCA/MCA INTEGRATED - SEMESTER - III EXAMINATION - WINTER 2025

Subject Code: BC03001011

Date: 28-11-2025

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. Use of simple calculators and non-programmable scientific calculators are permitted.**

Marks

- Q.1 (a)** 1. What is an operating system? **07**
- a) interface between the hardware and application programs
 - b) collection of programs that manages hardware resources
 - c) system service provider to the application programs
 - d) all of the mentioned
2. Multiprogramming increases CPU efficiency by allowing multiple programs to be in memory simultaneously. (True/ False)
3. In a _____, the CPU rapidly switches between multiple processes, giving the illusion of simultaneous execution.
4. Which one of the following is the deadlock avoidance algorithm?
- a) banker's algorithm
 - b) round-robin algorithm
 - c) elevator algorithm
 - d) karn's algorithm
5. An operating system deadlock occurs when a set of processes are blocked. (True/False)
6. To create a file _____.
- a) allocate the space in file system
 - b) make an entry for new file in directory
 - c) allocate the space in file system & make an entry for new file in directory
 - d) none of the mentioned
7. Full form of FAT.

- (b)** Give the Difference Between Traditional UNIX Systems & Modern UNIX Systems. **07**

- Q.2 (a)** Define Process. Explain Process state in detail. **07**

- (b)** Define Thread. Explain Types of Threads in detail. **07**

OR

- (b)** What is need of Execution of the OS? Explain in brief. **07**

- Q.3 (a)** Explain Principles of Concurrency in detail. **07**
- (b)** What is deadlock? How it detects and how it can be prevented? **07**

OR

- (a)** Discuss Readers/Writers Problem. **07**
- (b)** Explain Dining Philosophers Problem with example. **07**
- Q.4 (a)** Explain Memory Paging & Segmentation in detail. **07**
- (b)** Explain Page Replacement Algorithm. **07**

OR

- (a)** Define Swapping. What is need of it in the Operating System? **07**
- (b)** Explain CPU Scheduling Algorithm in detail. **07**
- Q.5 (a)** Discuss the importance and application of buffering in File I/O. **07**
- (b)** What do you mean by RAID Structure? Also discuss different types of RAID levels. **07**

OR

- (a)** Explain how the operating system manages File I/O operations? **07**
- (b)** What do you mean by directory structure? Also discuss different types of directory structures. **07**
