

Dr. Babasaheb Ambedkar Open University
Term End Examination July – 2026

Course	: BSCIT	Date	: 17/07/2026
Subject Code	: BSCITRMA-102	Time	: 11:30am to 01:45pm
Subject Name	: Fundamental of Operating System	Duration	: 02.15 Hours
		Max. Marks	: 70

Section A

Answer the following (Attempt any three) (30)

1. Discuss the characteristics of Batch, Multiprogramming and Time-Sharing Operating Systems.
2. Explain the structure of an Operating System. Compare Monolithic, Layered and Microkernel architectures.
3. Explain Shortest Job First (SJF), Priority Scheduling and Round Robin Scheduling.
4. What is Process Synchronization? Explain Critical Section Problem and the methods used to solve it.
5. Explain the concepts of Operating System Security and Protection. State the common security threats and protection mechanisms.

Section B

Answer the following (Attempt any four) (20)

1. Differentiate between Multiprogramming and Multitasking.
2. Differentiate between Process and Thread.
3. Write a short note on Deadlock.
4. Explain First Come First Serve (FCFS) Scheduling Algorithm.
5. What is Virtual Memory? State its advantages.
6. Explain Authentication and Authorization in Operating System Security

Section C

Part – A (Multiple Choice Questions) (10)

Q.1 Which type of Operating System allows multiple users to share CPU time simultaneously?

- | | |
|-------------------------------|----------------------------------|
| A) Batch Operating System | B) Time-Sharing Operating System |
| C) Real-Time Operating System | D) Embedded Operating System |

Q.2 Which Operating System structure organizes functions into hierarchical layers?

- | | |
|-------------------------|----------------------|
| A) Monolithic Structure | B) Layered Structure |
| C) Exokernel | D) Virtual Machine |

Q.3 Which scheduling algorithm assigns CPU based on the highest priority?

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|------------------------|----------------|
| A) FCFS | B) Round Robin |
| C) Priority Scheduling | D) FIFO |

Q.4 Which of the following is mainly responsible for executing process instructions?

- | | |
|---------------------|------------------|
| A) Secondary Memory | B) CPU |
| C) Compiler | D) Device Driver |

Q.5 Which memory allocation technique divides memory into variable-sized logical units?

- | | |
|-------------|-----------------|
| A) Paging | B) Segmentation |
| C) Swapping | D) Buffering |

Q.6 Which page replacement algorithm replaces the page that has not been used for the longest period?

- A) FIFO
- B) LRU
- C) Optimal
- D) Random

Q.7 Which of the following is an example of secondary storage?

- A) Cache Memory
- B) RAM
- C) Hard Disk
- D) Register

Q.8 Which component manages files and directories in an Operating System?

- A) File System
- B) CPU Scheduler
- C) Boot Loader
- D) BIOS

Q.9 Which security mechanism verifies a user's identity before granting access?

- A) Backup
- B) Authentication
- C) Compression
- D) Scheduling

Q.10 Which program is generally executed first during the Operating System boot process?

- A) Word Processor
- B) Boot Loader
- C) Spreadsheet
- D) Device Driver

Part – B (State whether the following statements are true or false) (10)

- 1 A Time-Sharing Operating System allows multiple users to use the system interactively.
- 2 Layered Operating System architecture improves modularity.
- 3 Round Robin Scheduling assigns CPU based on process priority.
- 4 Segmentation divides memory into logical segments of varying sizes.
- 5 LRU is a page replacement algorithm.
- 6 Threads belonging to the same process share common resources.
- 7 Device management is one of the responsibilities of an Operating System.
- 8 A directory is used to organize files.
- 9 Authorization is performed before authentication.
- 10 A boot loader helps load the Operating System into memory.
