

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

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

Section A

Answer the following (Attempt any three) (30)

1. Explain the services provided by an Operating System.
2. Explain Threads and Concurrency in Operating Systems.
3. What is CPU Scheduling? Explain SJF and Round Robin Scheduling with suitable examples.
4. Explain Deadlocks in Operating Systems. Discuss the necessary conditions for deadlock, deadlock prevention, avoidance, detection, and recovery techniques.
5. Discuss file allocation methods, free-space management techniques, and their advantages and limitations.

Section B

Answer the following (Attempt any four) (20)

1. Explain the evolution of Operating Systems.
2. Write a short note on Virtual Machines.
3. Differentiate between User Mode and Kernel Mode.
4. Explain Context Switching.
5. Write a short note on Device Management.
6. Explain the objectives of Operating System Security.

Section C

Part – A (Multiple Choice Questions) (10)

Q.1 Which Operating System service is responsible for allocating CPU time and memory to running programs?

- | | |
|------------------------|--------------------|
| A) Resource Allocation | B) File Management |
| C) Error Detection | D) Accounting |

Q.2 Which Operating System structure minimizes kernel functionality and moves many services to user space?

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

Q.3 Which process state indicates that a process is waiting for an external event to occur?

- | | |
|----------------------|---------------|
| A) Ready | B) Running |
| C) Waiting (Blocked) | D) Terminated |

Q.4 Which scheduling algorithm assigns CPU time to each process for a fixed time interval?

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

Q.5 Which synchronization mechanism is commonly used to control access to shared resources?

- A) Semaphore
- B) Scheduler
- C) Loader
- D) Buffer

Q.6 Which memory management technique divides a program into logical units of different sizes?

- A) Paging
- B) Segmentation
- C) Swapping
- D) Caching

Q.7 Which device is primarily responsible for managing communication between the CPU and peripheral hardware?

- A) Bootstrap Loader
- B) Device Controller
- C) Shell
- D) Scheduler

Q.8 Which file allocation method stores a table of block addresses separately from the file data?

- A) Linked Allocation
- B) Indexed Allocation
- C) Contiguous Allocation
- D) Sequential Allocation

Q.9 Which security principle ensures that users receive only the permissions necessary to perform their assigned tasks?

- A) Resource Sharing
- B) Least Privilege
- C) Multiprogramming
- D) Spooling

Q.10 During Operating System installation, which partition is generally used to store the operating system files?

- A) Recovery Partition
- B) System Partition
- C) Temporary Partition
- D) Cache Partition

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

(10)

- 1 Operating System services simplify interaction between users and computer hardware.
- 2 A thread represents a lightweight unit of execution within a process.
- 3 Context switching enables the CPU to alternate execution among multiple processes.
- 4 Round Robin scheduling is particularly suitable for time-sharing systems.
- 5 Deadlocks may occur when competing processes permanently wait for shared resources.
- 6 Segmentation divides memory according to the logical structure of a program.
- 7 Device management coordinates communication between the operating system and hardware devices.
- 8 Indexed file allocation maintains a separate index block containing addresses of data blocks.
- 9 User authentication is one of the basic security functions of an Operating System.
- 10 Proper partition planning should be completed before installing an Operating System.
