

Dr. Babasaheb Ambedkar Open University, Ahmedabad

Term-End Examination : January-2026

Course Name : MSCIT

Date : 19-02-2026

Subject Name : Fundamental of Operating System

Time : 11:30AM TO 01:45PM

Subject Code : MSCIT-104

Max Marks : 70

Section A

Q.-1. Answer the following. (Attempt any three) (30)

- (1) Explain the Multilevel Feedback Queue Scheduling algorithm and the parameters used to define its behavior.
- (2) Compare the three multithreaded models: Many-to-One, One-to-One, and Many-to-Many.
- (3) Explain Paged Memory Allocation (Paging) and how the Page Map Table (PMT) maps logical addresses to physical addresses.
- (4) Describe the Demand Paging mechanism and the step-by-step procedure for handling a Page Fault.
- (5) Detail the different Inter-Process Communication (IPC) mechanisms: Shared Memory, Message Passing, and Semaphores.

Section B

Q.-2. Write short notes on any four of the following topics. (20)

- (1) Discuss the unique features and scheduling requirements of a "Real Time System."
- (2) Identify and explain four critical issues of Multicore Programming.
- (3) Differentiate between Deadlock Avoidance and Deadlock Detection.
- (4) Explain the difference between Logical and Physical addresses and the role of the Memory Management Unit (MMU).
- (5) What is the Translation Look-aside Buffer (TLB) and how does it reduce memory access time?
- (6) Discuss the "Belady's Anomaly" in the context of page replacement policies.

Section C

Q.-3. Select the correct response for each of the following questions. (10)

(1) Which register is used to generate the next instruction address?

- | | |
|------------------------------|-----------------------|
| A) Instruction Register (IR) | B) Data Register (DR) |
| C) Program Counter (PC) | D) Accumulator (AC) |

(2) In the memory hierarchy, which is the fastest storage component?

- | | |
|--------------|------------------|
| A) RAM | B) Cache Memory |
| C) Registers | D) Magnetic Disc |

(3) Performance of cache memory is measured in terms of ____.

- | | |
|----------------|--------------------------|
| A) Speed ratio | B) Hit ratio |
| C) Access time | D) Locality of reference |

(4) The first state of a process when it is born in the environment is ____.

- | | |
|------------|------------|
| A) Running | B) Ready |
| C) Created | D) Waiting |

(5) PCB stands for ____.

- | | |
|--------------------------|-------------------------|
| A) Process Control Block | B) Process Center Board |
| C) Program Control Block | D) Program Center Board |

(6) Number of processes completed per given time unit is called ____.

- | | |
|--------------------|------------------|
| A) Turnaround time | B) Waiting time |
| C) Throughput | D) Response time |

(7) Wasted memory within a fixed-sized partition is called ____.

- A) Internal fragmentation
- B) External fragmentation
- C) Swapping
- D) Segmentation

(8) Belady's Anomaly is generally found in which algorithm?

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

(9) Which directory structure allows a file or directory to be shared at two places?

- A) Single level
- B) Two level
- C) Tree structured
- D) Acyclic graph

(10) Which VI editor mode is used to insert text into a file?

- A) Command Mode
- B) Insert Mode
- C) Command line Mode
- D) Default Mode

Section D

Q.-4. Decide whether the statements given below are True or False. (10)

- (1) The Data Register (DR) in a processor is used to generate the next instruction address.
- (2) Interrupt routines allow the computer to handle other utilities while pausing regular tasks.
- (3) A hit ratio higher than 0.9 is generally considered a good rate for a processor's cache memory.
- (4) Throughput refers to the number of processes completed per given time unit.
- (5) Shortest-Job-First (SJF) scheduling is proven to give the minimal average waiting time.
- (6) Round-Robin scheduling is primarily designed for batch processing systems.
- (7) Multi-level feedback queue scheduling allows processes to move between different queues.
- (8) In the Many-to-One thread model, a single blocking system call blocks the entire process.
- (9) A page-fault occurs when a requested page is not currently present in the main memory.
- (10) Belady's Anomaly describes a situation where increasing the number of page frames also increases the number of page faults.
