

# UNIT-III: Process Management and Synchronization

## Multiple Choice Questions (MCQs)

**1. The Critical Section Problem deals with:**

- a) Memory management
- b) Process synchronization
- c) File management
- d) CPU scheduling

**Answer:** b) Process synchronization

**2. A critical section is a segment of code where:**

- a) Files are created
- b) Shared resources are accessed
- c) Memory is allocated
- d) Processes are terminated

**Answer:** b) Shared resources are accessed

**3. Which of the following is a requirement for a solution to the Critical Section Problem?**

- a) Mutual Exclusion
- b) Multiprogramming
- c) Swapping
- d) Paging

**Answer:** a) Mutual Exclusion

**4. Which hardware instruction is commonly used for synchronization?**

- a) Read
- b) Write
- c) Test-and-Set
- d) Compile

**Answer:** c) Test-and-Set

**5. A semaphore is mainly used for:**

- a) Memory allocation
- b) Process synchronization

- c) File protection
- d) CPU scheduling

**Answer:** b) Process synchronization

**6. The operations associated with semaphores are:**

- a) Open and Close
- b) Read and Write
- c) Wait and Signal
- d) Send and Receive

**Answer:** c) Wait and Signal

**7. A binary semaphore can have values:**

- a) 0 and 1
- b) 0, 1, and 2
- c) Any positive integer
- d) Only 1

**Answer:** a) 0 and 1

**8. Which of the following is a classical synchronization problem?**

- a) Paging Problem
- b) Producer-Consumer Problem
- c) Deadlock Detection Problem
- d) File Allocation Problem

**Answer:** b) Producer-Consumer Problem

**9. The Dining Philosophers problem illustrates issues related to:**

- a) File management
- b) Process synchronization and deadlock
- c) Memory management
- d) CPU scheduling

**Answer:** b) Process synchronization and deadlock

**10. Monitors are:**

- a) Hardware devices
- b) High-level synchronization constructs
- c) Scheduling algorithms
- d) Memory allocation techniques

**Answer:** b) High-level synchronization constructs

**11. Which of the following is true about monitors?**

- a) They allow only one process at a time to execute within them
- b) They allow unlimited concurrent access
- c) They are hardware components
- d) They replace CPU scheduling

**Answer:** a) They allow only one process at a time to execute within them

**12. IPC stands for:**

- a) Internal Process Communication
- b) Inter Process Communication
- c) Integrated Program Control
- d) Internal Program Communication

**Answer:** b) Inter Process Communication

**13. Pipes are generally used for communication between:**

- a) Unrelated processes on different systems
- b) Related processes on the same system
- c) Threads only
- d) CPUs only

**Answer:** b) Related processes on the same system

**14. FIFO in IPC stands for:**

- a) First In First Out
- b) Fast Input Fast Output
- c) File In File Out
- d) First Input First Output

**Answer:** a) First In First Out

**15. Which IPC mechanism allows unrelated processes to communicate?**

- a) Ordinary Pipe
- b) FIFO (Named Pipe)
- c) Thread
- d) Semaphore

**Answer:** b) FIFO (Named Pipe)

**16. Which IPC mechanism stores messages in a queue?**

- a) Shared Memory
- b) Pipe

- c) Message Queue
- d) Monitor

**Answer:** c) Message Queue

**17. Shared memory communication is generally:**

- a) Slower than message passing
- b) Faster than message passing
- c) Not used for IPC
- d) Used only in distributed systems

**Answer:** b) Faster than message passing

**18. Communication between processes on different systems usually requires:**

- a) Network communication
- b) Shared memory only
- c) Semaphores only
- d) Monitors only

**Answer:** a) Network communication

**19. Which synchronization mechanism is implemented entirely in software?**

- a) Semaphore
- b) Test-and-Set instruction
- c) Compare-and-Swap instruction
- d) Interrupt controller

**Answer:** a) Semaphore

**20. The bounded-buffer problem is also known as the:**

- a) Readers-Writers Problem
- b) Producer-Consumer Problem
- c) Dining Philosophers Problem
- d) Sleeping Barber Problem

**Answer:** b) Producer-Consumer Problem

# Fill in the Blanks

1. The section of code where shared data is accessed is called the \_\_\_\_\_ **section**.  
**Answer:** critical
2. The primary goal of synchronization is to ensure \_\_\_\_\_ **exclusion**.  
**Answer:** mutual
3. A hardware instruction commonly used for synchronization is \_\_\_\_\_ **-and-Set**.  
**Answer:** Test
4. A synchronization tool used to control access to shared resources is called a \_\_\_\_\_.  
**Answer:** semaphore
5. The two operations on semaphores are **wait** and \_\_\_\_\_.  
**Answer:** signal
6. A semaphore that takes values only 0 and 1 is called a \_\_\_\_\_ **semaphore**.  
**Answer:** binary
7. The Producer-Consumer problem is a classical problem of \_\_\_\_\_.  
**Answer:** synchronization
8. The Dining Philosophers problem demonstrates synchronization and \_\_\_\_\_ issues.  
**Answer:** deadlock
9. A high-level synchronization construct is called a \_\_\_\_\_.  
**Answer:** monitor
10. IPC stands for **Inter Process** \_\_\_\_\_.  
**Answer:** Communication
11. An ordinary pipe provides communication between related \_\_\_\_\_.  
**Answer:** processes
12. FIFO stands for **First In First** \_\_\_\_\_.  
**Answer:** Out
13. A named pipe is also called a \_\_\_\_\_.  
**Answer:** FIFO
14. An IPC mechanism that stores messages in a queue is called a \_\_\_\_\_ **queue**.  
**Answer:** message
15. The fastest IPC mechanism on a single system is \_\_\_\_\_ **memory**.  
**Answer:** shared
16. Communication between processes on different systems usually requires a \_\_\_\_\_.  
**Answer:** network
17. In monitors, only \_\_\_\_\_ process can execute at a time.  
**Answer:** one
18. The Readers-Writers problem is a classical synchronization \_\_\_\_\_.  
**Answer:** problem
19. Shared memory allows multiple processes to access a common memory \_\_\_\_\_.  
**Answer:** region
20. Synchronization hardware helps prevent \_\_\_\_\_ **conditions** in concurrent processes.  
**Answer:** race