

Reg No.: \_\_\_\_\_



**Jyothi Engineering College(Autonomous)**

M.Tech Degree S2 (R) Examination, May 2026 (2025 Scheme)

**25PCST202 - ADVANCED OPERATING SYSTEMS**



**Total Mark: 60**

**PART A**

**Answer All Questions**

1. Describe how context switching occurs during process scheduling. CO1 (5)
2. Describe how a system call handler functions in an operating system. CO2 (5)
3. Describe the Big Kernel Lock (BKL) used in the Linux kernel and explain its importance in synchronization. CO3 (5)
4. Illustrate the importance of zones in Linux memory management. CO4 (5)
5. Apply the understanding of device structures to explain the anatomy of block devices and distinguish them from character devices. CO5 (5)

**PART B**

**Answer Any Five Question(s)**

6. Apply your understanding of thread management to explain the process of creating threads, associated operations, and the concept of kernel threads in Linux. CO1 (7)
7. In a high-interrupt system (e.g., network server or device driver), apply the concept of bottom halves to explain why they are required and how any two bottom-half mechanisms are used in practice. CO2 (7)
8. In a Linux kernel scenario where, multiple processes access a shared resource. Apply synchronization techniques using semaphores and mutexes to control access and illustrate why semaphores are referred to as sleeping locks. CO3 (7)
9. Apply the concept of the Virtual File System (VFS) in a file access scenario (such as opening and reading a file in Linux) to explain how file operations are handled and describe the role and properties of VFS objects. CO4 (7)
10. Analyze how buffer management techniques can be applied in a Linux system with frequent disk read/write operations to optimize block I/O performance, and examine the role of buffers and buffer heads in ensuring efficient data handling. CO5 (7)
11. In a Linux kernel module with frequent hardware interrupts, apply appropriate interrupt control techniques to ensure safe execution, and analyze how improper handling affects system performance and correctness. CO2 (7)

12. In a Linux system with multiple processes, apply the concept of paging to explain virtual memory management and examine how pages, memory allocation techniques, and kernel mechanisms ensure efficient memory utilization.

CO4 (7)

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