



# **ABV- Indian Institute of Information Technology & Management, Gwalior**

## **Operating Systems (IT207)**

Major Examination (Session 2023–24)

Maximum Time: 3 Hours

Max Marks: 70

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**Note: Answer all questions. Assume suitable data wherever required.**

### **Section A (Short Answer Questions)**

1. Explain multiprogramming and multiprocessing with examples. (5 Marks)
2. What are system protection goals in an Operating System? (5 Marks)
3. Describe different types of Operating Systems with suitable examples. (5 Marks)

### **Section B (Long Answer Questions)**

4. (a) Explain the concept of deadlock with a real-life analogy.  
(b) Discuss methods of deadlock prevention and avoidance. (10 Marks)
5. (a) Differentiate between paging and segmentation.  
(b) Explain the concept of virtual memory and demand paging. (10 Marks)
6. (a) What are semaphores? Explain how they solve synchronization problems.  
(b) Demonstrate the use of monitors with an example. (10 Marks)
7. (a) Describe the file system structure in modern Operating Systems.  
(b) Explain directory implementation methods. (10 Marks)

### **Section C (Problem Solving)**

8. Consider three processes P1, P2, P3 with burst times 5, 9, and 6 units respectively. Calculate the average waiting time and turnaround time using: (i) FCFS (ii) SJF. (10 Marks)
9. Explain different disk scheduling algorithms (FCFS, SSTF, SCAN, C-SCAN) with an example queue of requests: 82, 170, 43, 140, 24, 16, 190 (Assume initial head = 50). (10 Marks)