ABV- Indian Institute of Information Technology & Management, Gwalior

Operating Systems (IT207)

Major Examination — Session 2024

Time: 3 Hours **Max Marks: 70**

Note: Attempt all questions. Be clear and precise in your answers.

Section A (Short Answer Questions)

1. Explain the differences between multiprogramming, multitasking, and multiprocessing. (5 Marks)

2. What are system calls? Discuss their role in operating systems with examples. (5 Marks)

3. Define deadlock. State necessary conditions for its occurrence. (5 Marks)

Section B (Long Answer Questions)

4. (a) Discuss the Banker's Algorithm for deadlock avoidance.
   (b) Apply it on a system with 3 processes and 3 resource types of your choice. (10 Marks)

5. (a) Explain contiguous and non-contiguous memory allocation.
   (b) Compare paging and segmentation. (10 Marks)

6. (a) Discuss producer-consumer problem.
   (b) Solve it using semaphores. (10 Marks)

7. (a) Explain I/O buffering.
   (b) Discuss device management techniques. (10 Marks)

Section C (Problem Solving)

8. Consider processes P1, P2, P3 with burst times 7, 4, and 10 respectively. Calculate average waiting and turnaround time using: (i) SJF (non-preemptive) (ii) Round Robin (quantum = 3). (10 Marks)

9. A disk has tracks requested in the order: 95, 180, 34, 119, 11, 123, 62, 64. The head starts at 50. Compute the total head movement using: (i) FCFS (ii) SCAN. (10 Marks)