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END SEMESTER EXAMINATION – AUGUST 2025
COMPUTER SCIENCE- II SEMESTER MCA
24MCA23 – OPERATING SYSTEMS

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

Instruction: *Answer should be written completely in English.*

SECTION - A

Answer any **FIVE** questions. Each question carries **SIX** marks each. (5X6=30)

1. Describe any three major services provided by an operating system.
2. Explain process control block in detail.
3. Apply Peterson's solution to a two-process synchronization problem and explain how it meets the critical section requirements.
4. Explain the Round Robin algorithm and evaluate the average waiting time and turnaround time with a time quantum of 3 units.

Process ID	Burst Time
P1	5
P2	7
P3	4
P4	6

5. Explain directory structure with types used in file systems.
6. Draw a neat labelled diagram showing the steps involved in handling a page fault and explain each step.
7. What is thrashing? Explain how it affects system performance and discuss methods to control it.
8. Explain the key requirements of a database operating system.

SECTION - B

Answer any **FOUR** questions. Each question carries **TEN** marks each. (4X10=40)

9. Explain the concepts of IPC, shared memory and message passing.
10. Explain the Design-Based Classification of operating system structures.
11. Explain the Priority and SJF scheduling algorithms for the given problem.

Process ID	Burst Time	Priority
P1	5	2
P2	3	4
P3	8	1
P4	6	3

12. Apply semaphores to solve the bounded buffer (producer-consumer) problem.
13. What is disk scheduling? Explain various types of disk scheduling algorithms.
14. Using a diagram, apply the concepts of virtual machine building blocks to design a simple VM setup.