

1C8112

Roll No.

Total No. of Pages: **2**

1C8112
M.C.A. I-Sem. (Main / Back) Exam., 2026
MCA-103 Operating System

Time: 3 Hours

Maximum Marks: 70
Min. Passing Marks: 28

Instructions to Candidates:

Attempt all Ten questions from Part A. All five questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

***Use of following supporting material is permitted during examination.
(As mentioned in form No. 205)***

1. NIL2. NIL**PART - A****[10×2=20]****(Word limit 25)**

- Q.1 Define a process. How does it differ from a program?
- Q.2 Differentiate between preemptive and non-preemptive scheduling.
- Q.3 What is a semaphore? Differentiate between binary and counting semaphores.
- Q.4 What is a Deadlock? List the necessary conditions for a deadlock to occur.
- Q.5 Differentiate between Linux and UNIX. Briefly explain the evolution of Linux.
- Q.6 Name any two Linux system calls for files, process management and signals.
- Q.7 What is the difference between if-then-else and case-switch statements?

- Q.8 What are filters in Linux? Give two examples.
- Q.9 Name commands used to create, delete and move files and directories.
- Q.10 What is the purpose of a boot loader? Name two popular Linux boot loaders.

[5×4=20]

PART – B

(Word limit 100)

- Q.1 Discuss process scheduling, its importance, and the different types of schedulers.
- Q.2 Explain the following classical synchronization problems:
- (a) The Producer-Consumer
 - (b) Readers-Writers
 - (c) Dining Philosophers problem
- Q.3 Explain the Linux architecture with a diagram showing its main layers. Describe the steps involved in installing Linux on a system.
- Q.4 Write and explain a sample shell script to automate a simple task, such as creating backups of a directory.
- Q.5 Describe file ownership and access permissions. Explain the numeric and symbolic representations.

PART – C

[3×10=30]

(Attempt any three questions)

- Q.1 Consider three processes with burst times 10, 5 and 8 ms. Draw Gantt charts and compute waiting and turnaround times for FCFS, SJF and RR (time quantum=4ms) scheduling.
- Q.2 Explain Page Replacement Algorithms with examples. Also discuss the page faults associated with it.
- Q.3 Demonstrate the use of Linux commands to create a file, change permissions and view process status.
- Q.4 Write a shell script to search for a particular word in all text files of a directory using *grep* and display the file names containing that word.
- Q.5 Write a shell script that prompts the admin to reboot or shutdown the system safely, logging the action in a file.