1C8112

Roll No. _____ Total No. of Pages: 3

1C8112

M.C.A. I - Sem. (Main / Back) Exam., - 2023

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 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. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

[10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1 What is a kernel in an operating system?

Q.2 Batch Systems are used for what type of jobs?

Q.3 Which three conditions must a solution to the critical section problem satisfy?

Q.4 Write the sequence in which a process may utilize a resource under normal mode of operation.

Q.5 What is Superblock in the Linux OS?

Q.6 What does the command "rm -r" command do?

Q.7 What are signals in Linux?

Q.8 What do the following two commands do? (i) $ cat > srijan (ii) $ cat file 1 >> file 2.

Q.9 Write the ownerships and access permissions for files in the Linux operating system.

Q.10 What is the function of GRUB?

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt all five questions

Q.1 What are threads? What advantages do threads have over multiple processes? What major disadvantages do they have?

Q.2 Differentiate between -

(i) Internal and External fragmentation

(ii) Paging and Segmentation

Q.3 Describe the architecture of the Linux Operating System.

Q.4 Write a Shell Script in Linux that accepts the names of two files, displays a menu with the following options –

(i) Copy

(ii) Rename

(iii) Delete

and depending on the option chosen by the user, copies the contents of first file to the second file, changes the name of the first file to the second, or deletes both the files.

Q.5 Explain the statement "In Linux, everything is a file". Describe three primary file types in Linux.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

Q.1 Consider the following table of arrival time and burst time for three processes P0, P1 and P2.

Process	Arrival Time	Burst Time
P0	0 ms	9 ms
P1	1 ms	4 ms
P2	2 ms	9 ms

The pre-emptive shortest job first scheduling algorithm is used. Scheduling is carried out only at arrival or completion of processes. What is the average waiting time for the three processes? Explain your answer.

Q.2 Explain Demand Paging and Thrashing in appropriate detail.

Q.3 What are System calls? Discuss their need and types in appropriate detail.

Q.4 Write a shell script to validate password strength. Requirements for the password string include -

- Length should have minimum of 8 characters.
- Should contain both, alphabet and number.
- Should contain both, small and capital case letters.

If the password doesn't comply with any of the above conditions, then the script should report it as a "Weak Password".

Q.5 Describe the Booting and Shutting down processes of Linux.
