**A–836**

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# MCS-504/MIT (CS)-304

## MCA/MSCIT/MSCCS

**(Operating System/Introduction to Operating System)**

1st/3rd Semester Examination, 2024 (June)

Time : 2:00 Hrs. Max. Marks : 70

***Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. ***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.***

### Section–A

**(Long Answer Type Questions)** 2×19=38

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. Provide a comprehensive overview of the historical development of operating systems, highlighting key milestones and the evolution from early batch processing systems to modern interactive and distributed operating systems.

2. Explain the fundamental concepts of a file system. What is the role of a file system in an operating system, and how does it organize and store data on storage devices ?

3. Discuss various process scheduling algorithms and compare their advantages, disadvantages, and suitability for different scenarios.

4. Provide a comprehensive overview of the shell scripts in Unix. Discuss the facilities offered by Unix Shells.

5. Explore the types of I/O devices commonly used in computing systems. Discuss the role of device drivers in interacting with hardware and facilitating communication between the operating system and peripherals.

## Section–B

**(Short Answer Type Questions)** 4×8=32

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Explain the concept of memory management and its significance in computer systems.

2. What do you mean by Interrupt ? What are the issues in handling the Interrupts ?

3. Consider a system using the Least Recently Used (LRU) page replacement algorithm with a page frame size of 4 KB. If a process accesses pages in the order : 1, 2, 3, 4,1, 2, 5,1, calculate the number of page faults and the final content of the page table.

4. What do you mean by interprocess communication ? Discuss how to create a new process in brief.

5. Explain any *eight* commands of Unix with syntax.

6. What is Virtual memory ? Explain the concept of paying and page replacement policy.

7. Given the burst times of processes :

| Process | Burst Time |
|---|---|
| P1 | 6 |
| P2 | 8 |
| P3 | 4 |
| P4 | 3 |

Assuming that the processes arrive at time 0, calculate the average turnaround time and waiting time using FCFS and SJF scheduling algorithm.

8. What is Deadlocks ? Explain deadlock prevention method with proper example.

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