A–0825

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MCS-504/MIT(CS)-304

OPERATING SYSTEM/INTRODUCTION TO OPERATING SYSTEM

(MCA/MSCIT/MSCCS)

Examination, June 2025

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. Explain the evolution of operating systems and discuss the operational view of an operating system in detail.

2. What are the key differences between paging and segmentation in memory management ? Describe the implementation of paging with the TLB scheme.

3. Explain the various disk scheduling algorithms with suitable examples.

4. Explain first fit, best fit and worst fit memory management algorithms. Consider the following memory partitions (in KB) available in the memory :

   100, 500, 200, 300, 600.

   The following processes (in KB) need to be allocated :

   212, 417, 112, 426

   Using the First Fit, Best Fit, and Worst Fit memory allocation strategies compute the total internal and external fragmentation.

5. Describe the structure and purpose of the Linux kernel. Discuss its components, including process management, memory management, and file systems.

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. What are the primary goals of an operating system ?
2. Explain Inode in Unix and its role in file management.
3. What is mutual exclusion ? Explain any one method for achieving it.
4. Write a short note on device drivers and their importance in I/O management.
5. Describe the differences between fixed and variable memory partitions.
6. Explain how semaphore is used to achieve synchronization.
7. Briefly describe the concept of shell programming and give an example of a simple shell script in Unix.

8. Consider the following set of processes with their arrival times and burst times :

Process	Arrival Time (ms)	Burst Time (ms)
P1	0	8
P2	1	4
P3	2	9
P4	3	5

Draw the Gantt chart and compute the average waiting time and turnaround time for FCFS, SJN, and RR (time quantum = 4 ms).

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