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MCS-504

Operating System

(MCA/MSCIT)

Ist / 3rd Semester Examination, 2023 (June)

Time : 2 Hours]   **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 answer to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

SECTION–A
(Long Answer Type Questions)

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.

(2×19=38)

1. (a) Discuss the history of operating system.

   (b) Explain the different types of schedulers.

2. (a) Consider the following set of processes. Draw Gantt charts and calculate average waiting time & average turnaround time using preemptive and non-preemptive SJF algorithms.

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

(b) What is the difference between deadlock avoidance and deadlock prevention? How can you prevent the system from deadlock?

3. (a) Discuss the methods to implement message passing IPC in detail.

(b) What are system calls? With examples explain different categories of system calls.

4. (a) Given memory partitions of 100K,500K,200K,300K and 600K. How each of the first fit, best fit and worst fit algorithms place processes of 212KB,417KB,112 KB and 426 KB size? Which algorithm makes efficient use of memory?

(b) Explain binary and counting semaphore.

5. (a) Operating system is a resource allocator. Yes, or No? Justify your answer.

(b) Explain any two algorithm of disk scheduling.

SECTION–B

(Short Answer Type Questions)

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.   (4×8=32)

1. Differentiate between time sharing and real time operating system.

2. What is paging? Explain paging hardware with translation look-aside buffer (TLB).

3. Draw and explain the device driver block structure of Linux.

4. What do you mean by CPU scheduling? Explain FCFS and SJF scheduling.

5. What do you mean by segmentation? Explain it with suitable example.

6. Explain the various access methods of file.

7. Find out whether the system is in safe state or not:

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	0	2	0	0	4	1	0	2
P1	1	0	0	2	0	1			
P2	1	3	5	1	3	7			
P3	6	3	2	8	4	2			
P4	1	4	3	1	5	7			

8. Explain the following :

DMA, Fragmentation of memory, Thrashing.

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