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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Supplementary Examinations, June/July 2024
Operating Systems
(CSE, IT & CSE-AIML)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 A List four services provided by an operating system, and explain how each of these creates convenience for users. In which cases would it be impossible for user-level programs to provide these services? Explain your answer. **[10M]**

  B With suitable example describe the following commands of UNIX: **[4M]**
  i. ls   ii. mv   iii. cat   iv. cp

OR

2 A Compare and contrast Multiprogramming, Multitasking and Multiprocessing. **[10M]**

  B Briefly discuss the view of an OS as a Resource Manager. **[4M]**

SECTION-II

3 A Demonstrate and Compare various Multi-Threaded Models with neat diagram. **[4M]**

  B Consider the following set of processes, with the arrival times and the length of the CPU-burst times given in milliseconds. **[10M]**

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	1
P4	5	4

Calculate the average waiting time and average turnaround time using SJF scheduling algorithms.

OR

4 A What is a shell? Explain types of shells. **[7M]**

  B Discuss scheduling criteria suggested for comparing CPU scheduling algorithms. **[7M]**

SECTION-III

5 A Explain the various strategies for dealing with the deadlocks prevention. **[7M]**

  B What is semaphore? Write the algorithm for readers-writers problem with semaphore. **[7M]**

OR

6 A Considering a system with five processes P0 through P4 and three resources of type A, B, C. Resource type A has 10 instances, B has 5 instances and type C has 7 instances. Suppose at time t0 following. snapshot of the system has been taken: **[10M]**

Processes	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

Answer following questions using Bankers algorithm:
   i.   Is the system in a safe state
   ii. Can request for (0, 2, 0) by P0 be granted immediately? Give reason

B   What are the necessary conditions to occur deadlock.   **[4M]**

SECTION-IV

7   A   Explain the following IPC models used by operating systems.   **[7M]**
       i.   Pipes   ii. Shared Memory Model

   B   Explain about   **[7M]**
       i.   First fit
       ii. Best fit
       iii. Worst fit
       Which algorithm makes the most efficient use of the memory?

OR

8   A   A small computer has 4 page frames. A process makes the following list of   **[10M]**
       page references:
       1, 2, 3, 4, 0, 3, 2, 1, 5, 2, 3, 1, 2, 5, 0
       How many page faults occur, using LRU and Optimal page replacement
       algorithms?

   B   Describe the following system calls with prototypes: **[4M]**
       i. msgget()   ii. semop()   iii. shmat()

SECTION-V

9   A   Discuss various file allocation methods in detail.   **[4M]**
   B   Discuss SSTF disk scheduling algorithm for the following sequence if the   **[10M]**
       head is at 64 and moving to higher 78, 16, 24, 41, 80, 91, 72, 30 if disk
       contains 100 tracks.

OR

10 A   Explain e various directory structures supported by operating systems.   **[4M]**
   B   Suppose that a disk drive has 200 cylinders, numbered 0 to 199. The drive is   **[10M]**
       currently serving a request at cylinder 50, The queue of pending requests, in
       FIFO order, is 95, 180, 34, 119, 11, 123, 62, 64 Starting from the current
       head position, what is the total distance (in cylinders) that the disk arm
       moves to satisfy all the pending requests, for each of the following disk-
       scheduling algorithms:
       i. FCFS   ii. SCAN

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