B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

August 2024 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 23CS4PCOPS **Max Marks: 100**
Course: Operating Systems

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

			UNIT - I	CO	PO	Marks
1	a)		Define Operating Systems and discuss different OS structures.	CO1	PO1	10
	b)		Explore the structure of process in the memory and highlight the importance of data structures used for storing process information. Provide the memory layout of process for simple C-program.	CO1	PO1	10
			UNIT - II			
2	a)		Discuss Multithreading concepts highlighting threading models and issues.	CO1	PO1	10
	b)		Consider the set of 5 processes whose arrival time and burst time are given below	CO2	PO2	10

Process ID	Arrival time (ms)	Burst time (ms)
P1	3	4
P2	5	2
P3	0	2
P4	5	4
P5	4	2

If the CPU scheduling policies are SJF, SRTF, calculate the average waiting time and draw the Gantt chart for each case.

			UNIT - III	CO	PO	Marks
3	a)		In brief explore classic problems of synchronization and give solution for Critical Section problem using Semaphores with no busy waiting.	CO2	PO2	10
	b)		Discuss the necessary conditions for deadlock and Resource Allocation Graph (RAG).	CO1	PO1	10
			UNIT – IV			
4	a)		Explain paging and segmentation of the memory management System.	CO1	PO1	10
	b)		Represent the steps to handle a page fault by the operating system with necessary explanation.	CO1	PO1	10
			OR			

	5	a)	Consider the following reference string, 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. Assuming three frames all initially empty how many page faults would occur for : (i)LRU (ii) FIFO (iii) optimal page replacement. Which of these is the most efficient in this case?	CO3	PO3	10
		b)	Discuss the different structures of page table with advantages and disadvantages.	CO1	PO1	10
			UNIT - V			
	6	a)	Explain the disk structure with respect to the file system and File Allocation Table.	CO1	PO1	10
		b)	Consider a disk with 200 cylinders, disk queue with requests for I/O to blocks on cylinders 99, 180, 36, 126, 15. If the initial position of the head is at cylinder 50 and Shortest Seek Time First disk scheduling algorithm is used, calculate the total number of head movements.	CO3	PO3	5
		c)	Develop the lock-key scheme of checking access rights.	CO1	PO1	5
			OR			
	7	a)	Discuss the different file allocation methods.	CO1	PO1	10
		b)	Define the following with respect to disk scheduling. (a) Seek time (b) Access time (c) Latency (d) Rotational Latency (e) Swap space.	CO1	PO1	10

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