U.S.N.										

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

Autonomous Institute Affiliated to VTU

August 2024 Supplementary Examinations

Programme: B.E. **Semester: IV**
Branch: Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 19CS4PCOPS **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.

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Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Define operating system. Explain different views of operating system.	*CO2*	*PO2*	**8**
	b)		What are system calls? Briefly explain each of its types.	*CO2*	*PO2*	**7**
	c)		Discuss the implementation of IPC using shared memory and message -passing approaches in detail.	*CO2*	*PO2*	**5**
			UNIT - II			
2	a)		Discuss scheduling criteria used in operating system.	*CO2*	*PO2*	**5**
	b)		Draw the Gantt chart illustrating the execution of these processes using FCFS, Non-Preemptive SJF, Preemptive Priority (larger priority is higher priority), and RR (with TQ = 2) scheduling. (i) What is the turn around time and waiting time of each process in all cases. (ii) At what time the ready queue has maximum number of processes in all the cases.	*CO1*	*PO1*	**10**
	c)		Give a brief description about multithreading and explain the different multithreading models.	*CO2*	*PO2*	**5**
			UNIT - III			
3	a)		What is deadlock? What are necessary conditions on operating system must satisfy for a deadlock to occur?	*CO2*	*PO2*	**5**

Process	Arrival Time	Burst Time	Priority
P1	0	10	3
P2	0	1	1
P3	3	2	3
P4	5	1	4
P5	10	5	2

	b)	Briefly explain which are the data Structure's required to implement Banker's Algorithm. Using Banker's algorithm, answer the following questions: - 1. What are the contents of need matrix? 2. Find if the system is in safe state? If it is, find the safe sequence. 3. If process P2 requests (0,1,1,3) resources can it be granted immediately.	***CO1***	***PO1***	**10**
	c)	Explain why tha dining philosopher problem is considered as a classical synchronization problem.	***CO2***	***PO2***	**5**
		UNIT - IV			
4	a)	What is paging? Explain paging hardware with translation look-aside buffer.	***CO2***	***PO2***	**5**
	b)	Consider the page reference string: **1, 0, 7, 1, 0, 2, 1, 2, 3, 0, 3, 2, 4,0,3,6,2,1** for memory with 3 frames. Apply FIFO, OPTIMAL and LRU replacement algorithms to determine the number of page faults. Which algorithm is most efficient?	***CO1***	***PO1***	**10**
	c)	What is thrashing? What is the cause of thrashing? How does the system detect thrashing? What can the system do to eliminate this problem?	***CO2***	***PO2***	**5**
		OR			
5	a)	Consider a logical address space of 64 pages of 1024 words each mapped onto a physical memory of 32 frames. How many bits are there in physical address and logical address respectively?	***CO1***	***PO1***	**6**
	b)	Given the 5 memory partitions 100KB, 500KB, 200KB, 300KB, and 600KB, how each of the best fit, first fit and worst fit algorithms place processes of 212KB, 417KB,112KB and 426KB size. Which algorithm makes efficient use of memory.	***CO1***	***PO1***	**6**
	c)	Discuss briefly Demand paging in memory management scheme.	***CO2***	***PO2***	**8**
		UNIT - V			
6	a)	Given the following sequences 95, 180, 34, 119, 11, 123, 62, 64 with the head initially at track 50 and ending at track 199. What is the total disk travelled by the disk arm to satisfy the request using FIFO, SSTF, SCAN, C-SCAN and LOOK.	***CO1***	***PO1***	**10**
	b)	Explain the access matrix method of system protection with domain as objects and discuss its implementation.	***CO2***	***PO2***	**10**

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

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			OR			
	7	a)	What is a file? Explain different allocation methods.	***CO2***	***PO2***	**10**
		b)	Consider a disk with 200 tracks and the queue has random requests from different processes in the order: 65, 58, 49, 28, 92, 145, 120, 78, 144 Initially arm is at 100. Find the average seek length using FCFS, SSTF, SCAN, and C-SCAN algorithm	***CO1***	***PO1***	**10**

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