PVP 20

Code: 20AM3301, 20DS3301

II B.Tech - I Semester – Regular/Supplementary Examinations
DECEMBER 2024

OPERATING SYSTEMS
(Common for AIML, DS)

Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

		UNIT – I	
1.	a)	Illustrate the system view of Operating System.	7 M
	b)	Elaborate the following: i) Single Processor Systems ii) Multi Processor Systems iii) Clustered Systems.	7 M
		OR	
2.	a)	Explain the layered approach of operating system structure with a supporting diagram.	7 M
	b)	What are system calls? Briefly point out its types with illustrations.	7 M
		UNIT – II	
3.		Assume the following workload in a system. All jobs arrive at time 0 in the order given.	14 M

	Process	Burst time	Priority
	P1	9	5
	P2	4	3
	P3	5	1
	P4	7	2
	P5	3	4
	Draw a Gantt chart illustrating the execution of these jobs using Priority CPU scheduling algorithm and also Calculate the average completion time, average waiting time and average turnaround time.		
	OR		
4.	a)	What is inter-process communication? Discuss message passing and the shared memory concept of IPC.	7 M
	b)	With a neat diagram, explain the states of a process with a transition diagram and process control block.	7 M
	UNIT-III		
5.	a)	Explain deadlock Detection in single Instance resource types.	7 M
	b)	How to Recover from Deadlock situations? Discuss in detail.	7 M
	OR		
6.	a)	Demonstrate Dining Philosopher's problem with necessary diagram and algorithms.	7 M
	b)	What is readers-writers problem? How it can be considered as synchronization problem? Explain its solution with semaphore	7 M

UNIT – IV			
7.		Consider the following : 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. Assuming three frames and all frames are initially empty. i) Solve by using FIFO page replacement algorithm. ii) Solve by using LRU page replacement algorithm. iii) Solve by using Optimal page replacement algorithm	14 M
OR			
8.		Develop and Explain clearly the following algorithms for Contiguous Memory Allocation for the given input: First Fit , Best Fit and Worst Fit Block Size[] = {100, 500, 200, 300, 600} Process Size[] = {212, 417, 112, 426}	14 M
UNIT – V			
9.	a)	What is Disk scheduling? Explain different Disk scheduling algorithms?	7 M
	b)	Given the following sequences 95, 180, 34, 119, 11, 123, 62, 64 with the track 50 and ending track 199. What is the total disk travelled by the disk arm using FCFS, SSTF and LOOK scheduling algorithm.	7 M
OR			
10.	a)	Explain the system calls for file I/O operations open(), create(), read(), write(),close(),lseek(), stat() and ioctl()	7 M

	b)	Explain the advantages and disadvantages of different directory structures.	7 M