Register Number:……..

B.E/B.TECH DEGREE EXAMINATIONS: NOV / DEC 2024

(Regulation 2018)

Fourth Semester

COMPUTER SCIENCE AND ENGINEERING

U18CSI4202**:** Operating System

COURSE OUTCOMES

CO1: Apply the concepts of CPU scheduling and Process synchronization.
CO2: Experiment creation of different virtual machines in a hypervisor.
CO3: Simulate the principles of memory management.
CO4: Identify appropriate file system and disk organizations for a variety of computing scenario.
CO5: Examine the features of various open source operating systems.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	List any two major activities of an operating system with regard to process management.	CO1	[K_1]
2.	What do you mean by system calls?	CO1	[K_1]
3.	Compare user threads and kernel threads.	CO1	[K_2]
4.	List some classic problem of synchronization.	CO1	[K_1]
5.	Evaluate the maximum number of pages needed, for a system that supports 16 bit address line and 1K page size.	CO3	[K_5]
6.	What are the conditions under which a deadlock situation may arise?	CO3	[K_1]
7.	State the cause of Thrashing.	CO4	[K_2]
8.	Consider a logical address space of 64 pages of 1024 words each, mapped onto a physical memory of 32 frames. a. How many bits are there in the logical address? b. How many bits are there in the physical address?	CO4	[K_3]
9.	Do FAT file system is advantageous? Justify.	CO5	[K_5]
10.	Why rotational latency is not considered in disk scheduling?	CO5	[K_1]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	In a scenario where two processes need to exchange data in real-time, which IPC mechanism would you choose and why?	8	CO1	[K_4]
	b)	Assess the importance of the memory management service in optimizing system performance and resource utilization.	8	CO1	[K_5]
12.		Illustrate how the FCFS (First-Come, First-Served) scheduling algorithm SIF algorithm and round robin algorithm (time slice = 2 ms) works for the given four processes arriving at time 0 with the following burst times:	16	CO2	[K_3]

Process	Burst Time
P1	6
P2	3
P3	7
P4	2

i) Calculate waiting time
ii) Calculate turnaround time
iii) Calculate average waiting time
iv) Calculate average turnaround time

13.	a)	Suppose that we have free segments with sizes: 6, 17, 25, 14, and 19. Create a table with size 13 K in the free segment using first-fit, best-fit and worst fit?	8	CO3	[K_3]
	b)	Compare paging and segmentation table with suitable diagram.	8	CO3	[K_4]
14.		Consider the following page reference using three frames that are initially empty. Find the page faults using LRU and optimal page replacement algorithm, where the page reference sequence: 7,0,1, 2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1?	16	CO3	[K_3]
15.		Suppose a disk drive has 400 cylinders , numbered 0 to 399.The driver is currently serving a request at cylinder 143 and previous request was at cylinder 125.The queue of pending request in FIFO order is: 86,147,312,91,177,48,309,222,175,130. Starting from the current head position what is the total distance in cylinders that the disk to satisfy all the pending request for each of the following disk scheduling algorithms? 1] SSTS 2] SCAN 3] C-SCAN	16	CO4	[K_4]
16.		Evaluate the impact of directory structure design on system performance, storage efficiency, and user experience.	16	CO4	[K_4]

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