Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U4C03

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2024

Fourth Semester

Computer Science and Business Systems

21UCB403-OPERATING SYSTEM

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1.	What is the Kernel?	CO1- U
2.	Compare and contrast DMA and cache memory.	CO1- U
3.	What is a semaphore?	CO1- U
4.	Define Critical section problem.	CO1- U
5.	DefineStarvationindeadlock?	CO1- U
6.	Program containing relocatable code was created, assuming it would be loaded at address 0. In its code, the programrefers tothe following addresses: 50, 78, and 150,152,154.Ifthe program is loadedinto memory starting atlocation250, howdothoseaddresseshavetobeadjusted?	CO2- App
7.	What are the various disk-scheduling algorithms?	CO1- U
8.	Ifthe average page faults service time of30ms and a memory access time of 100ns.Calculate the effective access time.	CO2- App
9.	List the advantages of Virtualization.	CO1- U
10.	What are the Components of a Linux System?	CO1- U

PART – B (5 x 16= 80 Marks)

11.	(a)	Explain the concept of multiprocessor and Multicore organization.	CO1- U	(16)
		Or		
	(b)	What is a Process? Explain the Process Control Block and the various Process States.	CO1- U	(16)

12.	(a)	Define Semaphore? and Explain the Readers Writers Problem and its solution using the Concept of Semaphore.	CO1- U	(16)
		Or		
	(b)	(i) Illustrate about critical-section problem and Peterson's solution in concurrency.	CO1- U	(10)
		(ii) Describe about Multithread Programming Model	CO1- U	(6)
13.	(a)	Given six memory partitions of 300 KB, 600 KB, 350 KB, 200 KB,750 KB, and 125 KB (inorder), how would the first-fit, best-fit, and worst-fit algorithmsplace processesofsize115 KB, 500 KB, 358KB, 200KB, and375 KB(inorder)?Rank the algorithms in terms of how efficiently they use memory Most systems allow programs to allocate more memory to its address space during execution. Data allocated in the heap segments of programs is an example of such allocated memory. What is required to support dynamic memory allocation in the scheme?	CO2-App	(16)
		Or		
	(b)	Consider the following page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 How many page faults would occur for the following replacement algorithms, assuming three frames that all frames are initially empty? a. LRU page replacement. b. FIFO page replacement c. Optimal page replacement	CO2- App	(16)
14.	(a)	Explain an organization of I/O functions with neat sketch.	CO1- U	(16)
		Or		
	(b)	Discuss various disk scheduling techniques with examples.	CO1- U	(16)
15.	(a)	Briefly explain the architecture of androidOS?	CO1- U	(16)
		Or		
	(b)	Explain about Linux kernel and virtualization with neat sketch	CO1- U	(16)