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Question Paper Code

12712

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Fourth Semester

Computer Science and Business Systems 20CBPC403 - OPERATING SYSTEMS

Regulations - 2020

Dui	Duration: 3 Hours Max.					
PART - A $(10 \times 2 = 20 \text{ Marks})$ Answer ALL Questions				Marks K- CO		
1.	What	is Kernel? Mention its types.	2	<i>K1</i>	CO1	
		is meant by virtualization?	2	<i>K1</i>	CO1	
	Quote the four situations under which CPU scheduling decisions take place.				CO2	
	List out the merits and demerits of thread handling.				CO2	
	What are the requirements that a solution to the critical section problem must satisfy?					
6.	What is resource allocation graph?				CO3	
7.	What are the different accessing methods of a file?				CO4	
8.	State Internal Fragmentation.				CO4	
9.	What is meant by Kernel in Linux system?				CO5	
10.	. What is thrashing?				CO5	
11.	a)	PART - B (5 × 13 = 65 Marks) Answer ALL Questions State the purpose of interrupts. How does an interrupt differ from a trap? Explain in detail.	13	K2	CO1	
	OR					
	b)	Discuss about the different operating system structure with the help of neat sketch.	13	K2	CO1	
12.	a) i)	What is a process? Explain the different process states.	7	K2	CO2	
	, ,	Explain process scheduling. Discuss about the different types of schedulers in short.	6	K2	CO2	
		OR	1.2	77.0	G02	
	b)	Consider the following set of processes, with the length of the CPU burst time given in milliseconds. Draw the Gantt chart illustrating the execution of these processes using FCFS, SJF (preemptive), Round Robin (time quantum=2), Priority. Calculate the average turnaround time, average waiting time.		K3	CO2	

Process	Arrival Time	Burst time	Priority
P1	0	10	2
P2	1	6	3
P3	2	12	1
P4	3	15	4

13. a) What is message passing? Discuss procedure consumer problem with 13 K2 CO3 message passing.

OR

b) Demonstrate the classical problems of synchronization.

- 13 K3 CO3
- 14. a) Consider the reference string 6, 1, 1, 2, 0, 3, 4, 6, 0, 2, 1, 2, 1, 2, 0, 3, 13 K3 CO4 2, 1, 2, 0 for a memory with three frames and calculate number of page faults by using FIFO,LRU and Optimal Page replacement algorithms. Also calculate the hit ratio and miss ratio.

OR

- b) Explain with the help of examples FIFO and LRU, optical page 13 K2 CO4 replacement algorithms with example reference string. Mention the merits and demerits of each of the above.
- 15. a) Suppose the order of request is- 82,170,43,140,24,16,190. Total ¹³ ^{K3} ^{CO5} 200 Tracks and current position of Read/Write head is: 50 moving in left direction. Find the number of head movements in cylinders using FCFS, SCAN, SSTF and LOOK.

OR

b) Illustrate various file allocation methods with their relative advantages 13 K2 CO5 and disadvantages.

 $PART - C (1 \times 15 = 15 Marks)$

16. a) Consider the following system structures in the Banker's algorithm 15 K3 CO3 with resources A, B, C and process P0 to P4:

Allocation Available Max Need A B C A B C A B C A B C 7 5 3 **P0** 0 1 0 3 3 2 2 0 0 3 2 **P1** 2 9 0 2 3 0 2 **P2** 2 2 2 **P3** 2 1 1 **P4** 0 0 2 4 3 3

Using Banker's algorithm ,answer the following questions:

- (ii) What are the contents of the need matrix?
- (iii) Is the system in a safe state? Why?
- (iv) If a request from process P4 arrives for additional resources of
- (1, 2, 0) can the banker's algorithm grant their request immediately? Show the new system state.

OR

b) i) Demonstrate the methods for handling deadlock.

9 K3 CO3

ii) Classify deadlock and starvation.

K3 CO3