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10CS53

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022
Operating Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. What is meant by a System Call? Briefly describe any 4 types of System Calls. **(10 Marks)**

b. Define Operating System. List and explain briefly any four services provided by an Operating System. **(10 Marks)**

2 a. How do threads differ from processes? Describe the different Threading models. **(10 Marks)**

b. Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. In answering the questions, use non – preemptive scheduling and base all decisions on the information you have at the time the decision must be made.

Process	Arrival Time	Burst Time
P_1	0.0	8
P_2	0.4	4
P_3	1.0	1

i) What is the Average turnaround time for these processes with the FCFS scheduling algorithm?

ii) What is the Average turnaround time for these processes with the SJF scheduling algorithm? **(10 Marks)**

3 a. Define Critical section problem with a general structure of a process. Explain the different requirements to solve the critical section problem. **(10 Marks)**

b. What is meant by Process Synchronization? Briefly discuss the classic problems of Process Synchronization. **(10 Marks)**

4 a. List briefly the methods to recover from the deadlocks. **(05 Marks)**

b. Consider the following snapshot of a system :

	Allocation				MAX				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P_0	0	0	1	2	0	0	1	2	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

Answer the following using the Banker's algorithm :

i) What is the content of the matrix need?

ii) Is the system in a Safe state? **(06 Marks)**

c. Describe about Monitors. Provide a monitor solution to the Dining – Philosopher problem. **(09 Marks)**

PART – B

5 a. When do a Page fault occurs? Draw and describe the steps involved in handling a page fault. **(10 Marks)**

b. Explain the different factors considered in comparing different Memory Management Strategies. **(10 Marks)**

6 a. Describe in detail about Directory Structure and any four operations that are performed on a directory. **(07 Marks)**

b. Consider a system that supports 5000 users. Suppose that you want to allow 4990 of these users to be able to access one file.

i) How would you specify this protection scheme in UNIX?

ii) Could you suggest another protection scheme that could be used more effectively for this purpose than the scheme provided by UNIX? **(07 Marks)**

c. Draw and describe the file allocation table. **(06 Marks)**

7 a. Suppose that a disk drive has 5000 cylinders , numbered 0 to 4999. The drive is currently serving a request at cylinder 143 and the previous request was at cylinder 125. The queue of pending requests in FIFO order is :

86, 1470 , 913 , 1774 , 948 , 1509 , 1022 , 1750 , 130

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk scheduling algorithms?

i) FCFS ii) SSTF iii) SCAN iv) LOOK v) C – SCAN. **(10 Marks)**

b. What is Access Matrix? Discuss the access matrix with copy rights and owner rights. **(10 Marks)**

8 a. Discuss the design goals for Microsoft Windows XP. **(10 Marks)**

b. What is Slab Allocation? Discuss the Slab allocation in Linux Operating System. **(10 Marks)**

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