BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)

B. Tech. Sem - IV COMPUTER SCIENCE & ENGINEERING-A&M : SUMMER : 2024

SUBJECT: OPERATING SYSTEM

Day : Monday
Date : 27/05/2024

S-23947-2024

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data if **NECESSARY**.

Q.1 What are the foal of operating system? What is kernel? What is the type of kernel? **(10)**

OR

What are the components of Operating system? **(10)**

Q.2 What is PCB? Describe schedular in detail. **(10)**

OR

Differentiate Thread vs process? Explain life cycle of thread? Also describe its benefits. **(10)**

Q.3 Calculate Avg Waiting time and avg Turnaround time using SJF Non Preemptive and Preemptive Algorithm. **(10)**

PID	Arrival Time	Burst Time
P1	1	7
P2	3	3
P3	6	2
P4	7	10
P5	9	8

OR

Q.3 3 Calculate Avg. Waiting time and avg. Turnaround time using FCFS, SJF, NP & Pre-emptive CPU scheduling. **(10)**

Process	Burst Time	Arrival Time
P1	6 ms	2 ms
P2	2 ms	5 ms
P3	8 ms	1 ms
P4	3 ms	0 ms
P5	4 ms	4 ms

Q.4 What is Race Condition? How to avoid it. **(10)**

OR

Q.4 Consider a system that contains five processes P1, P2, P3, P4, P5 and the thee resource types A, B and C. Following are the resources types:A has 10, b has 5 and the resource types C has 7 instances. **(10)**

P.T.O.

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P1	0	1	0	7	5	3	3	3	2
P2	2	0	0	3	2	2			
P3	3	0	2	9	0	2			
P4	2	1	1	2	2	2			
P5	0	0	2	4	3	3			

Answer the following questions using the banker's algorithm :

1. What is the reference of the need matrix?
2. Determine if the system is safe or not.

Q.5 What is thrashing? What are the causes of thrashing? How it can be limited? **(10)**

OR

Consider a reference string : 4,7,6,1,7,6,1,2,7,2. The number of frames in the memory is 3. Find out the number of page faults respective to **(10)**

1. Optimal page Replacement Algorithm
2. FIFO page Replacement Algorithm
3. LRU Page Replacement Algorithm

Q.6 What is meant by RAID? Which Raid structure is mostly useful in real time application? **(10)**

OR

Consider a disk with 200 tracks and the queue has random requests from different processes in the order: **30, 55, 58, 39, 18, 90, 160, 29, 38, 184,** Initially arm is at 100. Find the total Seek time using FIFO, SSTF, SCAN and C-SCAN, LOOK and CLOOK algorithm. **(10)**

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