BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
Computer Science & Engineering-AI&ML
B. Tech. Sem - IV :SUMMER : 2023
SUBJECT : OPERATING SYSTEM

Day : Saturday
Time : 10:00 AM-01:00 PM

Date : 27-05-2023
S-23947-2023
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 is Operating System? Explain various system components with a neat diagram. **(10)**

OR

Define essential properties of the following operating system
Batch 2. Interactive 3. Time Sharing 4. Real time.

Q.2 What is Context Switching? Also describe the scheduler. **(10)**

OR

What is Cooperative Process? Explain its Operation.

Q.3 **(10)**

Calculate Avg. Waiting and avg. Turnaround time using SJF, Priority Pre-emptive CPU Scheduling.

Process	Arrival Time	Priority	Burst Time
P1	0 ms	3	3 ms
P2	1 ms	2	4 ms
P3	2 ms	4	6 ms
P4	3 ms	6	4 ms
P5	5 ms	10	2 ms

OR

What are the criteria for CPU Scheduling? Describe in detail.

Q.4 What is semaphore? What operations are performed on semaphore? Give an implementation of semaphore and explain how it avoids busy waiting? **(10)**

OR

Consider a system that contains five processes P1, P2, P3, P4, P5 and the three resource types A, B and C. Following are the resources types: A has 10, B has 5 and the resource type C has 7 instances.

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.
3) What will happen if the resource request (1,0,0) for process P1 can the system accept this request immediately?

(P.T.O.)

Q.5 Consider the Pages reference by the CPU in the order are 6,7,8,9,6,7,1,6,7,8,9,1. 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

OR

What is Belad's Anomaly.? Explain in detail using suitable example.

Q.6 What is File Management? Explain File Access mechanism in detail. (10)

OR

Consider a disk with 200 tracks and the queue has random requests from different processes in the order:
55,58,39,18,90,160,150,38,184
Initially arm is at 100. Find the total Seek time using FIFO, SSTF,SCAN and C-SCAN algorithm.

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