## C Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Operating System

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

## PART - A

- 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. Explain Process State with diagram. What is the need for context switch? Explain fields of PCB. (06 Marks)
  - b. Consider four jobs as following. Find waiting time, turnaround time and hence average waiting time and average turnaround time using preemptive SJF and RR (with quantum time = 1) scheduling algorithms. If quantum time is set to 2, what is the behavior of RR? Comment on this.

Jobs	P <sub>1</sub>	P <sub>2</sub>	$P_3$	P <sub>4</sub>
Arrival time	0	0.2	0.6	1.2
Burst time	5	2	8	4

(10 Marks)

- c. Why thread is called LWP? Describe anyone threading model and threading issue. (04 Marks)
- 3 a. Explain the critical section problem. List and explain the requirements to be met by a solution to critical section problem. (08 Marks)
  - b. Describe the monitor solution to the classical dining-philosopher's problem. (08 Marks)
  - c. What do you mean by a binary semaphore and a counting semaphore? (04 Marks)
- 4 a. List briefly the methods to recover from the deadlocks.

(05 Marks)

b. Consider the following snapshot of a system

Allocation				
	A	В	C	D
$P_0$	0	0	1	2
$P_1$	1	0	0	0
P <sub>2</sub>	1	3	5	4
$P_3$	0	6	3	2
P <sub>4</sub>	0	0	1	4

	*	$\mathbf{M}_{A}$	AX	
gr f	A	В	C	D
	0	0	1	2
	1	7	5	0
	2	3	5	6
	0	6	5	2
	0	6	5	6

Available					
A	В	C	D		
1	5	2	0		

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. Explain File Attributes and File operations.

(12 Marks)

b. Explain different file access methods.

(08 Marks)

- 7 a. What is disk scheduling? Explain the following with diagram:
  - i) FCFS ii) SSTF iii) SCAN.

(10 Marks)

- b. What is an access matrix? Explain the following operations in access matrix with an example for each:
  - i) Copy ii) Transfer iii) Limited copy.

(10 Marks)

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- 8 a. Discuss the design goals for Microsoft Windows XP. RANGALORE 560 037 (10 Marks)
  - b. What is Slab Allocation? Discuss the Slab allocation in Linux Operating System. (10 Marks)