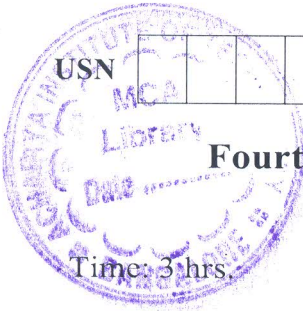


# CBCS SCHEME



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18CS43

## Fourth Semester B.E. Degree Examination, Jan./Feb. 2023 Operating Systems

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Define Operating System. Explain briefly multiprogramming and time sharing system. (08 Marks)
- b. Explain various OS services. (05 Marks)
- c. What are system calls? Briefly explain types of system call. (07 Marks)

OR

- 2 a. With a neat diagram, explain the different state of process. (07 Marks)
- b. Explain scheduler in a process execution. (05 Marks)
- c. Explain direct and indirect communication with respect to message passing systems. (08 Marks)

### Module-2

- 3 a. Discuss multithreading models. (05 Marks)
- b. Discuss the benefits of multithreaded programming. (05 Marks)
- c. Consider the following set of four process with length of CPU burst given in MS:

Process	Burst time
P1	24
P2	3
P3	3

Compute the waiting time and avg. turnaround time for the above process using FCFS scheduling algorithm. (10 Marks)

OR

- 4 a. Explain requirements must satisfy to critical section problem. (04 Marks)
- b. Illustrate with an example Peterson's solution problem. (08 Marks)
- c. Explain syntax and schematic view of monitors. (08 Marks)

### Module-3

- 5 a. What are necessary conditions for deadlock? (04 Marks)
- b. Explain different methods to recovery from deadlocks. (08 Marks)
- c. Consider the following snapshot of system:

Process	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

Find the need matrix and calculate safe sequence using bankers algorithm-mention the above is safe or not safe. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. What is paging hardware with TLB? (07 Marks)  
b. Explain structure of page table with respect to hierarchical paging. (08 Marks)  
c. Explain the process of segmentation. (05 Marks)

**Module-4**

- 7 a. Describe the steps in handling a page fault. (06 Marks)  
b. Explain copy on write process in virtual machine. (06 Marks)  
c. Explain FIFO and optimal page replacement algorithm. (08 Marks)

OR

- 8 a. Explain with a diagram any two disk allocation method in detail. (08 Marks)  
b. List the different operations performed on a directory. (06 Marks)  
c. Explain tree structured directory structure. (06 Marks)

**Module-5**

- 9 a. Explain SCAN, CSCAN and LOOK scheduling techniques. (08 Marks)  
b. Explain access matrix model of implementing protection in OS. (06 Marks)  
c. Explain bad-block recovery in detail. (06 Marks)

OR

- 10 a. With a diagram, explain the component of LINUX system. (08 Marks)  
b. Explain the IPC mechanisms in LINUX. (06 Marks)  
c. Discuss passing of data among process in LINUX system. (06 Marks)

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