

CBCS SCHEME

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18CS43

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

Time: 3 hrs.

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)

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)
