

CBCS SCHEME

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18MCA25

Second Semester MCA Degree Examination, Aug./Sept.2020 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, its goals and also discuss the services of operating system. (10 Marks)
b. Explain any two I/O communication techniques with flow chart. (10 Marks)

OR

- 2 a. Classify the types of system calls, how does system call work? Discuss with neat diagram. (10 Marks)
b. Explain the following types of OS: i) Real time ii) Clustered system. (10 Marks)

Module-2

- 3 a. Describe briefly PCB. Explain 2-state process model and 5-state process model with neat diagram. (10 Marks)
b. What is thread? With neat diagram explain User Level Thread (ULT) and Kernel Level Thread (KLT) and also list the advantages and disadvantages. (10 Marks)

OR

- 4 a. Consider the following set of processes with given length of CPU burst.

Processes	P ₁	P ₂	P ₃	P ₄	P ₅
Burst time	6	2	8	3	4
Arrival time	2	5	1	0	4

Draw Gantt chart for SJF (preemptive) and SJF (Non-preemptive). Find the average waiting time, for each scheduling algorithm. (10 Marks)

- b. What is critical section? Explain reader's writer's problem and write the solution using semaphore. (10 Marks)

Module-3

- 5 a. What do you mean by demand paging? Discuss the procedure for handling page faults, with neat diagram. (10 Marks)
b. Consider the following snapshot of a system:

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P ₀	0	1	0	7	5	3	3	3	2
P ₁	2	0	0	3	2	2			
P ₂	3	0	2	9	0	2			
P ₃	2	1	1	2	2	2			
P ₄	0	0	2	4	3	3			

Answer the following questions using banker's algorithm:

- i) What is the content of the matrix need?
ii) Is the system in a safe state?
iii) If a request from process P₁ arrives for (1, 0, 2) can this request be granted immediately? (10 Marks)

OR

- 6 a. Write short notes about: i) Fragmentation ii) Thrashing (10 Marks)
b. Consider the following page reference strings: 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1 for a memory with 3 frames how many page faults would occur for
i) LRU Algorithm
ii) FIFO algorithm
iii) Optimal page replacement algorithm which is the most efficient among them. (10 Marks)

Module-4

- 7 a. Why is file protection needed? Briefly explain the different types of file access methods. (05 Marks)
b. Explain the tree structured directories with neat diagram. (05 Marks)
c. Write a short note on:
i) Directory Implementation
ii) Free space management. (10 Marks)

OR

- 8 a. List and explain different file allocation method. (10 Marks)
b. Consider a disk queue with request for I/O to block on cylinders 98, 183, 37, 122, 14, 124, 65, 67 in that order, if the disk head is initially at cylinder 53. Find the number of head movements using the following algorithms: i) FCFS ii) SSTF iii) SCAN iv) LOOK. (10 Marks)

Module-5

- 9 a. Discuss about process management in LINUX operating system. (10 Marks)
b. Explain the components of LINUX operating system. (10 Marks)

OR

- 10 a. What are the different file system types in LINUX OS? (10 Marks)
b. Define Inter process communication and explain how it is handled in LINUX OS. (10 Marks)
