

Roll No.

Total No. of page(s) 1.

MCA/DII: 4529(R)
MCA-304 : Operating System

Time: Three hours

Sr. No.	Note: Q. No. 1 is compulsory. In addition, attempt four more questions selecting exactly one question from each unit.	[Maximum Marks: 80]	Marks allotted
Compulsory Question			
I(a)	List the major characteristics of operating system.		
(b)	Differentiate between preemptive scheduling and non-preemptive scheduling.		
(c)	What are the benefits of processes being co-operative?		
(d)	State the various methods for handling a deadlock.		
(e)	Differentiate between logical address space and physical address space.		
(f)	State the various file access methods.		
(g)	Why rotational latency is usually not considered in disk scheduling?		
(h)	Differentiate between Unix and Linux.		
UNIT - I			
II(a)	Discuss following in brief. (i) Batch Systems (ii) Multiprogrammed Systems (iii) Multiprocessor Systems (iv) Distributed Systems (v) Real-Time Systems	10	
(b)	How interrupts are handled by operating system? Explain	4	
III	Discuss various algorithms for CPU-Scheduling. Explain with suitable examples. Also describe various methods for evaluating the algorithms.	14	
UNIT - II			
IV(a)	What is a semaphore? How semaphores can be implemented? Discuss various types of semaphores along with their usage.	7	
(b)	Explain Readers-Writers problem along with its solution in detail.	7	
V	How can we perform following: (i) Deadlock Prevention (ii) Deadlock Detection (iii) Deadlock Recovery	14	
UNIT - III			
VI(a)	Consider the following page-reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 5 How many page faults would occur for the following replacement algorithms, assuming three, four or five frames? Remember that all frames are initially empty, so your first unique pages will cost one fault each. (i) LRU replacement (ii) FIFO replacement (iii) Optimal replacement.	9	
(b)	What is segmentation? Discuss segmentation hardware with the help of diagram. What type of fragmentation can be caused by segmentation?	5	
VII(a)	Consider a system that supports the strategies of contiguous, linked, and indexed allocation. What criteria should be used in deciding which strategy is best utilized for a particular file?	5	
(b)	Explain various attributes and operations of a file. Also discuss the protection mechanism in a file system.	9	
UNIT - IV			
VIII(a)	Suppose a disk drive has 5,000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 85, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 Starting from the current head position, what is the total distance (in cylinder) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms? (i) FCFS (ii) SSTF (iii) SCAN (iv) C-SCAN (vi) C-LOOK.	9	
(b)	State three advantages and disadvantages of placing functionality in a device controller, rather than in the kernel.	5	
IX(a)	In a dynamic protection what are the various questions that may arise about revocation of access rights. Explain various schemes for implementing revocation for capabilities.	1	
(b)	What are the various components of a Window system? How processes are managed in Windows? Describe in brief.	2	