

University of Mumbai

Program: Cyber Security

Curriculum Scheme: Rev2019

Examination: SE Semester :IV

Course Code: CSC404

Course Name: Operating System

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1. is a large kernel, including scheduling file system, networking, device drivers, memory management and more.
Option A:	Monolithic kernel
Option B:	Micro kernel
Option C:	Macro kernel
Option D:	Mini kernel
2.	Round robin scheduling falls under the category of _____
Option A:	Non-preemptive scheduling
Option B:	Preemptive scheduling
Option C:	All of the mentioned
Option D:	None of the mentioned
3.	A semaphore S is an integer variable that, apart from initialization, is accessed only through two standard atomic operations:
Option A:	exec() and exit()
Option B:	exec() and signal()
Option C:	wait() and exit()
Option D:	wait() and signal()
4.	Operating System maintains the page table for _____
Option A:	each thread
Option B:	each instruction
Option C:	each address
Option D:	each process
5.	Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?
Option A:	fragmentation
Option B:	mapping
Option C:	paging
Option D:	None of above
6.	_____ is a unique tag, usually a number identifies the file within the file system.
Option A:	File identifier

Option B:	File name
Option C:	File type
Option D:	None of the mentioned
7.	Mapping of file is managed by _____
Option A:	file metadata
Option B:	page table
Option C:	virtual memory
Option D:	file system
8.	The device-status table contains _____
Option A:	each I/O device type
Option B:	each I/O device address
Option C:	each I/O device state
Option D:	all of the mentioned
9.	Which buffer holds the output for a device?
Option A:	spool
Option B:	output
Option C:	status
Option D:	magic
10.	In Unix, Which system call creates the new process?
Option A:	fork
Option B:	create
Option C:	new
Option D:	none of the mentioned

Q2	Solve any Two Questions out of Three 10 marks each												
A	What is a deadlock? Explain the necessary and sufficient conditions for deadlock.												
B	<p>A system shares 9 tape drives. The current allocation and maximum requirement of tape drives for three processes are shown below:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Process</th> <th>Current Allocation</th> <th>Maximum Requirement</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>3</td> <td>7</td> </tr> <tr> <td>P2</td> <td>1</td> <td>6</td> </tr> <tr> <td>P3</td> <td>3</td> <td>5</td> </tr> </tbody> </table> <p>Which of the following best describes current state of the system?</p>	Process	Current Allocation	Maximum Requirement	P1	3	7	P2	1	6	P3	3	5
Process	Current Allocation	Maximum Requirement											
P1	3	7											
P2	1	6											
P3	3	5											
C	Explain interrupt driven IO & discuss the advantages of Interrupt Driven IO over the Programmed IO.												

Q3.	Solve any Four Questions out of Six 5 marks each
A	What is mutual exclusion ? Explain its significance.
B	Explain the following i) file types ii) file operation iii) file attributes
C	Discuss operating system as a resource manager.
D	Define Operating system. Brief the functions of OS.
E	Explain Thrashing.
F	What are the three methods for allocating disk space? Explain.

Q4.	
A	Solve any Two 5 marks each
i.	Differentiate between Fixed size partitioning & Dynamic Partitioning.
ii.	Draw a process state diagram & explain its states. New, Ready, Running, Wait, Suspended wait, Suspended ready.
iii.	Explain the following disk scheduling algorithm with examples. i) SSTF ii) SCAN iii) LOOK Comment on the selection of these scheduling methods.
B	Solve any One 10 marks each
i.	Consider a system having m resources of the same type. These resources are shared by 3 processes A, B, C, which have peak time demands of 3, 4, 6 respectively. The minimum value of m that ensures that deadlock will never occur is
ii.	Suppose Disk drive has 5000 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 is ordered as 80, 1470, 913, 1777, 948, 1022, 1750, 130. What is the total distance that the Disk arm moves for following by applying given algorithms? 1) FCFS 2) SSTF 3) LOOK 4) SCAN.