

Programme: BCA

Course: Operating System

Course Code: 3CCC203

Enrolment no. _____

Full Marks: 70

Time: 3 Hrs.

Q. No.	Questions	CO	Bloom Taxonomy Category	Marks															
Section I																			
1	Short Answer type questions			4 x 5 = 20															
a	State the various components of an operating system structure and explain the layered structure of an operating system.	CO1	Remember																
	or																		
b	Differentiate between i. Multiprogramming Operating System and Multitasking Operating System ii. Real time Operating system and Distributed system	CO1	Analyze																
	or																		
c	Explain critical section problem. Discuss the requirements that a solution to the critical section problem must satisfy.	CO2	Understand																
	or																		
d	Discuss the term swapping. Explain the concept of overlays.	CO2	Understand																
	or																		
e	State the difference between logical address and physical address.	CO3	Analyze																
	or																		
f	Explain thrashing. How it can be controlled?	CO3	Analyze																
	or																		
g	Differentiate between device driver and device controller.	CO4	Analyze																
	or																		
h	What is a file? What are its attributes? Explain file operations.	CO4	Remember																
	or																		
Section II																			
Long Answer type questions																			
2	<p>Consider the following set of processes with the CPU-burst time given in milliseconds.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Process ID</th> <th>Arrival Time</th> <th>Burst Time</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>0</td> <td>9</td> </tr> <tr> <td>P2</td> <td>1</td> <td>4</td> </tr> <tr> <td>P3</td> <td>2</td> <td>9</td> </tr> <tr> <td>P4</td> <td>3</td> <td>5</td> </tr> </tbody> </table> <p>Draw the Gantt charts explaining the execution of these processes using FCFS and RR (q=2ms) Scheduling. a) Find the average Turnaround Time b) Find the average Waiting Time</p>	Process ID	Arrival Time	Burst Time	P1	0	9	P2	1	4	P3	2	9	P4	3	5	CO2	Evaluate	3 x 10 = 30
Process ID	Arrival Time	Burst Time																	
P1	0	9																	
P2	1	4																	
P3	2	9																	
P4	3	5																	
	or																		
	Explain different methods to recover from deadlock.	CO2	Analyze																
	or																		
3	What is disk scheduling algorithm? Explain any two-disk scheduling algorithm.	CO4	Understand																
	or																		
4	Determine the most common schemes for defining the logical structure of a directory.	CO4	Understand																
	or																		
5	Define Semaphore. What are the different types of semaphore? Describe the properties of semaphores. How semaphores provide solution for the Reader Writer problem?	CO2	Understand																
	or																		
	Explain mutual exclusion. Explain Peterson's solution for mutual exclusion problem.	CO2	Analyze																

Section III			
	Application based questions		
5	Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB. How would each of the First fit, Best-Fit and Worst-Fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB? Analyze which one is the most appropriate one and why?	CO3	Analyze
	or		
	Consider the page reference string: 1,0,7,1,0,2,1,2,3,0,3,2,4,0,3,6,2,1 for a memory with three frames. Determine the number of page faults using the FIFO, Optimal, and LRU replacement algorithms. Explain which algorithm is most efficient.	CO3	Analyze
			1 x 20 = 20

COURSE OUTCOME

At the end the course the candidate will able to

CO1: Create processes and threads

CO2: Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time

CO3: For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time

CO4: Design and implement file management system