

CBCS SCHEME

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22MCA12

First Semester MCA Degree Examination, Dec.2023/Jan.2024 Operating System Concepts

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C																																																																					
Q.1	a.	What is an Operating System? Explain with a neat diagram the components of computer systems.	10	L2	CO1																																																																					
	b.	Explain various services provided by the operating system.	10	L2	CO1																																																																					
OR																																																																										
Q.2	a.	Explain with the neat diagram the memory hierarchy.	10	L2	CO1																																																																					
	b.	Explain different types of system program.	10	L2	CO1																																																																					
Module – 2																																																																										
Q.3	a.	Illustrate with a neat sketch, the process state and process control block.	10	L3	CO2																																																																					
	b.	Discuss the various multithreading models. Also mention the benefits of multithreading.	10	L2	CO2																																																																					
OR																																																																										
Q.4	a.	Calculate the Average Waiting Time by drawing Gantt chart for	10	L3	CO2																																																																					
		i) Round robin method with the time quantum (q) = 2 ms.																																																																								
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		ii) Shortest Remaining Time First (SRTF) with preemptive mode																																																																								
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b.	Explain the various operations of the processing with a neat diagram.				10	L2	CO2																																																																			
Module – 3																																																																										
Q.5	a.	Explain Dining Philosopher's problem, illustrate using semaphore, how to handle it.	10	L3	CO3																																																																					
	b.	Considering the following example of a system, check whether the system is safe or not using Banker's Algorithm. Also determine the sequence of if it is safe.	10	L3	CO3																																																																					
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OR					
Q.6	a.	What is deadlock? Explain the necessary conditions for the deadlock in detail.	10	L2	CO3
	b.	Illustrate with example Peterson's solution for critical section problem and prove that the mutual exclusion property is preserved.	10	L4	CO3
Module – 4					
Q.7	a.	Consider the following page reference string 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2,3,7,6,3,2,1,2,3,6. How many page faults would occur, assuming three frames for FIFO, LRU and Optimal Page Replacement?	10	L3	CO4
	b.	Write short note on : i) Internal and external fragmentation ii) Dynamic loading and linking.	10	L2	CO4
OR					
Q.8	a.	Explain contiguous memory allocation.	10	L2	CO4
	b.	Illustrate with a help of supporting diagram TLB improves the performance of demand paging.	10	L3	CO4
Module – 5					
Q.9	a.	Explain the following terms briefly. i) File attributes ii) File type	10	L2	CO5
	b.	With a neat diagram illustrate the working of various file access methods.	10	L3	CO5
OR					
Q.10	a.	Explain the following terms briefly. i) File operations ii) File system mounting	10	L2	CO5
	b.	Illustrate the various directory structures and discuss in detail.	10	L3	CO5
