CBCS SCHEME

USN | | | | | | | | | | |

22MCA12

First Semester MCA Degree Examination, Dec.2024/Jan.2025
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.	Discuss in detail any four types of system call.	10	L2	CO1
	b.	Explain different types of service provided by the operating systems.	10	L2	CO1
		OR			
Q.2	a.	Briefly explain the following: i) Multiprogramming ii) Time sharing iii) Real time iv) Distributed.	10	L2	CO1
	b.	Describe multiprocessor system and clustered system.	10	L2	CO1
		Module – 2			
Q.3	a.	Describe briefly PCB, with a neat diagram explain the 5 state process model.	9	L2	CO1
	b.	Explain briefly short term scheduler, long term scheduler and medium term scheduler.	5	L2	CO1
	c.	Write a C program to simulate FCFS CPU scheduling algorithm to find turnaround time and waiting time.	6	L3	CO5
		OR			
Q.4	a.	Explain with a neat diagram multithreading models.	9	L2	CO1
	b.	Explain briefly single thread and multithreaded process.	5	L2	CO1
	c.	Write a C program to simulate SJF non-preemptive CPU scheduling algorithm to find turnaround time and waiting time.	6	L3	CO5
		Module – 3			
Q.5	a.	Explain readers writers problem and write the solution using semaphore.	10	L3	CO2
	b.	Describe the Dinning philosophers problem.	4	L2	CO2
	c.	Write a C program to simulate dinning philosophers problem.	6	L3	CO4

		OR			
Q.6	**a.**	Solve the following using Banker's algorithm: Process Allocation MAX Available A B C D A B C D A B C D P_0 0 0 1 2 0 0 1 2 1 5 2 0 P_1 1 0 0 0 1 7 5 0 P_2 1 3 5 4 2 3 5 6 P_3 0 6 3 2 0 6 5 2 P_4 0 0 1 4 0 6 5 6 i) What is the content of need matrix? ii) Whether the system is in safe state?	**10**	**L3**	**CO2**
	b.	Discuss the necessary condition for deadlock.	**4**	**L2**	**CO2**
	c.	Write a C program to simulate Bankers algorithm for the purpose of deadlock avoidance.	**6**	**L3**	**CO5**
		Module – 4			
Q.7	**a.**	Explain with a diagram, how TLB is used to solve the problem of simple paging scheme.	**10**	**L2**	**CO3**
	b.	With a neat diagram explain segmentation.	**6**	**L2**	**CO3**
	c.	Write a C program to simulate MVT memory management technique.	**4**	**L3**	**CO5**
		OR			
Q.8	**a.**	Consider the following page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. How many page faults would occur in the case i) FIFO ii) Optimal iii) LRU algorithm. Let us assume 3 frames are empty initially.	**10**	**L3**	**CO3**
	b.	Write a short note on virtual memory.	**6**	**L2**	**CO3**
	c.	Write a C program to simulate MFT memory management technique.	**4**	**L3**	**CO5**
		Module – 5			
Q.9	**a.**	List and explain different types of file attributes.	**10**	**L2**	**CO3**
	b.	Explain various file operations.	**10**	**L2**	**CO3**
		OR			
Q.10	**a.**	Explain with a neat diagram, contiguous and linked allocation method.	**10**	**L2**	**CO3**
	b.	With a neat diagram, explain single-level directory and two-level directory.	**10**	**L2**	**CO3**

* * * * *