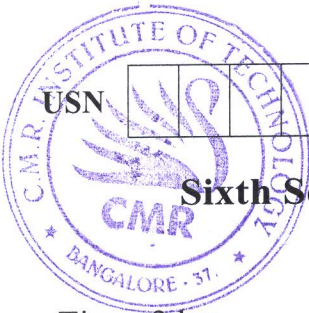


CBCS SCHEME

17CS64



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Sixth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Operating Systems

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- What is Operating System? What are its goals? Discuss its roles from different perspectives. (10 Marks)
 - List out three main advantages of multi processor system. Distinguish between symmetric and asymmetric multiprocessing. (10 Marks)

OR

- What is a process? Draw and explain the process state diagram. (10 Marks)
 - Explain the implementation of inter process communication using shared memory and message passing. (10 Marks)

Module-2

- What is a thread? What is the need for multithreaded processes? Explain 3 models of multithreaded programming. (10 Marks)
 - What is semaphore? How it can be used to solve mutual exclusion problem? Give solution to bounded buffer problem using semaphore. (10 Marks)

OR

- What are the necessary and sufficient conditions for deadlocks? Briefly explain. (10 Marks)
 - Define Dining Philosopher's problem and give solution for the same using monitor. (10 Marks)

Module-3

- Describe a resource allocation graph
 - With a deadlock
 - With a cycle but no deadlock.(08 Marks)
 - Determine whether the following system is in safe state by using Banker's algorithm.

Process	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
P ₀	0	1	0	7	5	3	3	3	2
P ₁	2	0	0	3	2	2			
P ₂	3	0	2	9	0	2			
P ₃	2	1	1	2	2	2			
P ₄	0	0	2	4	3	3			

If a request for P₁ arrives for (1 0 2), can the request be granted immediately? (12 Marks)

OR

- 6 a. Explain in detail internal and external fragmentations. How these problems are overcome? (10 Marks)
- b. With an example, explain the concept of paging in paging what is the worst case and avg internal fragmentation per process. (10 Marks)

Module-4

- 7 a. What is virtual memory? How can it be implemented? What are its benefits? (10 Marks)
- b. Explain: i) Demand paging ii) Dynamic linking iii) Copy-on-write iv) Thrashing. (10 Marks)

OR

- 8 a. List and explain different file types, file attributes and file operations. (10 Marks)
- b. Explain different types of directory structures with examples and their advantages and disadvantages. (10 Marks)

Module-5

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- 9 a. Explain contiguous allocation of disk space methods. BANGALORE - 560 037 (08 Marks)
- b. Describe Bit vector and linked list, grouping approaches to managing free space on a disk. (06 Marks)
- c. What is a boot block and bad block? Explain the techniques used for handling bad blocks. (06 Marks)

OR

- 10 a. Define the following terms with ref to scheduling: (10 Marks)
- Constant Linear Velocity (CLV)
 - Constant Angular Velocity (CAV)
 - Seek time
 - Rotational latency.
- b. Explain the following disk scheduling in brief with examples: (10 Marks)
- FCFS
 - SSTF
 - SCAN
 - LOOK.
