

CBCS SCHEME

22MCA12



First Semester MCA Degree Examination, June/July 2024 Operating System Concepts

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 Operating System? Explain multiprogramming and time sharing system. | 06 | L1 | CO1 | | | | | | | | | | | | | | | | | | | | |
| | b. | Explain dual mode operating system with a neat block diagram. | 10 | L1 | CO1 | | | | | | | | | | | | | | | | | | | | |
| | c. | Distinguish between the client – server and peer – to – peer models of distributed system. | 04 | L2 | CO1 | | | | | | | | | | | | | | | | | | | | |
| OR | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.2 | a. | What is Interprocess communication? Explain direct and Indirect communication with respect to message passing system. | 10 | L2 | CO1 | | | | | | | | | | | | | | | | | | | | |
| | b. | What are system calls? Briefly print out its types. | 04 | L2 | CO1 | | | | | | | | | | | | | | | | | | | | |
| | c. | Analyze modular kernel approach with layered approach with a neat sketch. | 06 | L2 | CO1 | | | | | | | | | | | | | | | | | | | | |
| Module – 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.3 | a. | What is process? What is PCB? What are the different states of a process? Explain using diagrams. | 10 | L2 | CO2 | | | | | | | | | | | | | | | | | | | | |
| | b. | Write a note on IPC. Explain two methods. | 04 | L2 | CO2 | | | | | | | | | | | | | | | | | | | | |
| | c. | Explain in detail direct and indirect communication. | 06 | L2 | CO1 | | | | | | | | | | | | | | | | | | | | |
| OR | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.4 | a. | What is a multithread programming? Explain multithreading models. | 08 | L1 | CO2 | | | | | | | | | | | | | | | | | | | | |
| | b. | What is CPU scheduler? Consider the following set of process, with the length of the CPU-burst time given in milliseconds. Find Turnaround Time and Waiting time. <table><tr><td>Process</td><td>Arrival Time</td><td>Burst Time</td></tr><tr><td>P1</td><td>0</td><td>7</td></tr><tr><td>P2</td><td>1</td><td>5</td></tr><tr><td>P3</td><td>2</td><td>3</td></tr><tr><td>P4</td><td>3</td><td>1</td></tr><tr><td>P5</td><td>4</td><td>2</td></tr><tr><td>P6</td><td>5</td><td>1</td></tr></table> | Process | Arrival Time | Burst Time | P1 | 0 | 7 | P2 | 1 | 5 | P3 | 2 | 3 | P4 | 3 | 1 | P5 | 4 | 2 | P6 | 5 | 1 | 12 | L3 |
| Process | Arrival Time | Burst Time | | | | | | | | | | | | | | | | | | | | | | | |
| P1 | 0 | 7 | | | | | | | | | | | | | | | | | | | | | | | |
| P2 | 1 | 5 | | | | | | | | | | | | | | | | | | | | | | | |
| P3 | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | |
| P4 | 3 | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| P5 | 4 | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| P6 | 5 | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Module – 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.5 | a. | What is monitor? With a neat diagram explain the working of monitor. | 06 | L2 | CO3 | | | | | | | | | | | | | | | | | | | | |
| | b. | What is a Semaphore? Define wait and signal operation. Explain the usage of semaphores. | 08 | L2 | CO3 | | | | | | | | | | | | | | | | | | | | |
| | c. | What is paging? Give advantages and disadvantages. | 06 | L2 | CO3 | | | | | | | | | | | | | | | | | | | | |
| OR | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.6 | a. | What are deadlocks? What are its characteristics? Explain the necessary condition for its occurrence. | 10 | L1 | CO3 | | | | | | | | | | | | | | | | | | | | |
| | b. | What is Resource Allocation Graph (RAG)? Explain how RAG is very useful in describing deadly embrace by considering your own example. | 10 | L1 | CO3 | | | | | | | | | | | | | | | | | | | | |

Module – 4

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| Q.7 | a. | Explain the multistep processing of a user program with a neat block diagram. | 06 | L2 | CO4 |
| | b. | Explain with a diagram, how TLB is used to solve the problem of simple paging scheme. | 06 | L2 | CO4 |
| | c. | Distinguish between: i) Logical address space and physical address space ii) Internal fragmentation and External fragmentation iii) Paging and Segmentation | 08 | L2 | CO4 |

OR

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|-----|----|---|----|----|-----|
| Q.8 | a. | Discuss in detail about contiguous memory allocation with a neat diagram. | 10 | L2 | CO4 |
| | b. | Explain basic method of implementing paging concept. | 10 | L2 | CO4 |

Module – 5

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|-----|----|--|----|----|-----|
| Q.9 | a. | What is File Concept? Discuss briefly about file attributes and operation. | 06 | L2 | CO5 |
| | b. | Explain various access methods in File System. | 06 | L2 | CO5 |
| | c. | What is a Directory Structure? Explain scheme for defining the logical of a directory. | 08 | L1 | CO5 |

OR

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|------|----|--|----|----|-----|
| Q.10 | a. | Explain about File System Mounting in detail. | 10 | L2 | CO5 |
| | b. | Explain about PROTECTION with types of access. | 10 | L3 | CO5 |

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