

MCA-14-35**OPERATING SYSTEMS**

Maximum marks: 100 (External: 80, Internal: 20)

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Introductory Concepts: Operating system functions, structure, types viz. distributed systems, special-purpose systems, open-source operating systems; Operating system services, system calls, system programs.

CPU Scheduling: Process concepts, process operations, inter-process communication, scheduling criteria, scheduling algorithms, Comparative study of scheduling algorithms, Multiple processor scheduling.

UNIT – II

Concurrent Processes: Critical section problem, Semaphores, Classical process co-ordination problems and their solutions, monitors, synchronization examples.

Deadlocks: Deadlock characterization, Deadlock prevention and avoidance, Deadlock detection and recovery.

UNIT – III

Memory Management: Swapping, Paging, Segmentation, Virtual memory concepts: Demand Paging, Page replacement Algorithms, Thrashing.

Storage Management: File concepts, File access and allocation methods, File-system mounting, sharing, protection, structure and implementation. Directory Systems: Structured Organizations, directory protection mechanisms, recovery. Disk scheduling.

UNIT – IV

Protection & Security: Goals & principles of protection, domains of protection, access matrix, access controls. Security: Security problem, threats, security tools, classification.

Distributed Systems: Types of network-based OS, Network structure and topologies, Communication structure & Protocol, design issues. Distributed File-system: Remote file access, File replication, examples.

Distributed synchronization: Mutual exclusion, Concurrency control, deadlock handling.

Text Books:

1. Silberschatz A., Galvin P.B., and Gagne G., Operating System Concepts, Wiley India Pvt. Ltd.
2. Godbole, A.S. Operating Systems, Tata McGraw-Hill, New Delhi.
3. Tanenbaum, A.S., Operating System- Design and Implementation, Prentice Hall of India.

Reference Books:

1. Deitel, H.M., Operating Systems, Addison- Wesley Publishing Company, New York.
2. Stalings William, Operating System, Prentice Hall of India, New Delhi.