CCCS-1-05T Operating Systems

Total Marks: 100
External Marks: 70
Internal Marks: 30
Credits: 4
Pass Percentage: 40%

Objective

Understanding basics of operating system viz. system programs, system calls, user mode and kernel mode. Working with CPU scheduling algorithms for specific situation, and analyze the environment leading to deadlock and its rectification. Exploring memory management techniques viz. caching, paging, segmentation, virtual memory, and thrashing.

SECTION A

UNIT- I: Introduction and System Structures: Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Computing Environments, Operating-System Services, User and Operating-System Interface, System Calls, Types of System Calls, System Programs.

UNIT II: Process Management: Process Concept, Process Scheduling, Operations on Processes, Multi-threaded programming: Multithreading Models, Process Scheduling: Basic Concepts, Scheduling Criteria, and Scheduling Algorithms.

Unit III: Deadlock: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

UNIT IV: Memory Management: Basic Hardware, Address Binding, Logical and Physical Address, Dynamic linking and loading, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Demand Paging, Page Replacement algorithms

SECTION B

UNIT V: File Systems: File Concept, Access Methods, Directory and Disk Structure, File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

UNIT VI: **Introduction to Linux:** Linux's shell, Kernel, Features of Linux, Using file system: Filenames, Introduction to different types of directories: Parent, Subdirectory, Home directory; rules to name a directory, Important directories in Linux File System,

UNIT VII: Linux Commands: cal, date, echo, bc, who, cd, mkdir, rmdir, ls, cat cp, rm, mv, more, gzip, tar, File ownership, file permissions, chmod, Directory permission, change file ownership,

UNIT VIII: Shell Scripting: Creating and Executing Shell Programs, Using variables: Assigning a value to a variable, Accessing the value of a variable, Positional Parameters and other Built-In Shell Variables; Special Characters, Conditional Statements : if Statement, case Statement; Iteration Statements : for Statement, while Statement, until Statement

Suggested Readings

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications, 2009
2. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education, 2014
3. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education, 2000
4. S. Das, Unix Concepts and Applications, 4th edition, McGraw Hill Education, 2017