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Paper III – Operating Systems

Unit I

Introduction: What is an operating system? Mainframe, desktop, multiprocessor, distributed, clustered, real-time and handheld systems.

Operating System Structures: System components, operating system services, system calls, systems programs, system structure, virtual machines.

Unit II

Process: Process concept, process scheduling, operations on processes, cooperating processes. Inter process communication.

CPU Scheduling: Basic concepts, scheduling criteria, scheduling algorithms, algorithm evaluation.

Unit III

Process Synchronization: The critical section problem, semaphores, classical problems of synchronization.

Deadlocks: Deadlock characterization, methods for handling deadlocks. Deadlock prevention, avoidance and detection. Recovery from deadlocks.

Unit IV

Memory Management: Swapping, contiguous memory allocation, paging, segmentation, segmentation with paging.

Virtual Memory: Demand paging, page replacement, allocation of frames, thrashing.

Unit V

Linux: History, design principles, kernel modules, process management, scheduling, memory management, file systems, input and output, inter process communication, network structure, security.

Suggested Book

1. Silberschatz G.G., Operating System Concepts, John Wiley & Sons Inc.