

MARIS STELLA COLLEGE, VIJAYAWADA-8
(An autonomous college affiliated to Krishna University)

Department of Computer Science

Academic Year 2019 - 2020

Title : Operating Systems
Semester : III
Paper Code : COMPC072

Course Outcomes: At the end of the course, students are able to

1. Understand the services provided by and the design of an operating system.
2. Understand what the process is and how processes are synchronized and scheduled.
3. Understand different approaches to memory management.
4. Use system calls for managing processes and memory.

UNIT – I

10 Hours

OPERATING SYSTEM INTRODUCTION:

Operating Systems Objectives and functions, Computer System Architecture, Operating Systems Structure, OS Operations, Evolution of Operating Systems- Simple Batch, Multi programmed, Time Shared, Parallel, Distributed System, Real-time Systems.

UNIT –II

10 Hours

OPERATING SYSTEM ORGANIZATION:

Operating System services, User Operating System Interface, Process Modes, System Calls, Types of System Calls, System Programs, Operating Systems Structure, and System Boot.

UNIT – III

PROCESS MANAGEMENT:

10 Hours

Processes: The Process Model, Process Creation, Process Termination, Process Hierarchies, Process States, Process Control Block (PCB), Interprocess Communication, Communication in Client-Server Systems, Thread Model.

Scheduling: Basic Concepts: CPU-I/O Burst Cycle, CPU Scheduler, Preemptive Scheduling and NonPreemptive scheduling, Scheduling Criteria, Scheduling Algorithms.

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks and Deadlocks prevention.

UNIT – IV

10 Hours

MEMORY MANAGEMENT:

Memory Management Strategies:

Mapping address space to memory space, Memory Allocation Strategies: Contiguous Memory Allocation, Paging, Structure of Page Table, Segmentation.

Virtual Memory Management: Background, Demand Paging, Page Replacement, Allocation of frames, Thrashing.

UNIT – V

10 Hours

SHELL INTRODUCTION AND SHELL SCRIPTING:

What is Shell and various types of Shell, various editors present in Linux, Different modes of operations in vi editor, What is Shell Script, Writing and Executing the Shell script, Shell Variables (user defined and System variables), Pipes and Filters, Decision making in shell scripts(If else, Switch), Loops in Shell, Functions, Utility Programs (cut, paste, join, tr, uniq utilities), Pattern matching Utility(grep).

Prescribed Book:

1. Title: Operating System Principles
Author: Abraham Silberchatz, Peter Baer Galvin, Greg Gagne
Edition: 8th
Publication: Wiley India Edition
2. Title: Modern Operating Systems
Author: Andrew S Tanenbaum
Edition: 3rd
Publication: PHI Learning Private Limited
3. Title: Linux Unleashed
Author: Tim Parker
Edition: 3rd
Publication: Macmillan Computer Publishing

Reference Books:

1. William Stallings, Operating Systems Internals and Design Principles, 5th edition, Pearson Education.
2. Red Hat Linux, 2nd Edition, David Pitts Et Al

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BLUE PRINT OF MODEL PAPER

- ❖ The paper consists of two sections.
- ❖ All questions are compulsory from all parts.

SECTION – A

- ❖ Consists of Ten short answer questions from five units.
- ❖ Each question carries **1 Mark**.

SECTION – B

- ❖ Consists of five essay answer questions from **five units** with internal choice.
- ❖ Each question carries **10 Marks**.

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Model Question Paper

Title : Operating Systems
Paper Code: COMPC072
Semester : III

Max. Marks: 60
Time: 3 Hrs

Section – A

Answer all the questions.

10*1=10M

- a. What are the components of Operating System?
- b. What is DMA?
- c. What are the different types of Process Modes?
- d. What is System Boot?
- e. Write a Short note on PCB.
- f. What is Preemptive Scheduling?
- g. Define Swapping.
- h. Write a short note on Thrashing.
- i. What is the usage of the following commands 1) mv 2)cp.
- j. Explain in brief any two Iterative Statements in Linux.

Section – B

Answer the following

5*10=50M

2. (a) Write about System Architecture and Operating System Operations.
(b) Write briefly about the Storage Management and Protection and Security.

OR

(c) Write in detail about the Evolution of Operating System

3. (a) Write briefly about the services provided by Operating Systems
(b) Write briefly about the User Operating System Interface

OR

(b) What is a System call? Explain the types of System Calls

4. (a) Explain in detail about Interprocess Communication

OR

- (b) Write in brief about Basic Concepts of Scheduling.
- (c) Explain FIFO and Round-Robin Scheduling Algorithms.

5. (a) Write about Paging In detail with its Structure.

OR

- (b) Explain FIFO and Optimal Page Replacement Algorithms.

6. (a) What is a Shell. Explain the different types of Shell

- (b) How to do the Writing and Executing of the Shell script. Also write a short note on Shell Variables.

OR

- (c) Explain the Decision making in shell scripts.
- (d) Write a shell script program for displaying 'sum of digits'