

GANPAT UNIVERSITY, KHERVA

M.C.A. SEM-IV

MCA 401: OPERATING SYSTEM

Teaching Scheme (Hrs Per Week)	
Th.	Pr.
4	3

Examination scheme (Marks)					
INTERNAL		EXTERNAL		TOTAL	
Th.	Pr.	Th.	Pr.	Th.	Pr.
30	20	70	30	100	50

UNIT: I

[25%]

- **Operating System Overview and Process Management:**
Introduction to Operating System, Types of Operating system, Operating System Services, Process, Process Control Block (PCB), Process States, Scheduling – Types of Schedules, Scheduling and Performance Criteria, Scheduling Algorithms – FCFS, SJF, Priority, Round Robin (RR) Scheduling.
- **Inter process Synchronization:** Mutual exclusion, Semaphore, Classical Problems in Synchronization, Inter process Communication and Synchronization: Critical Region, Deadlocks, Deadlock Detection, Deadlock Prevention, Deadlock Avoidance, Recovery

UNIT: II

[25%]

- **Memory Management:**
Background, Logical versus Physical Address space, Partitioning, Fixed and variable size partitioning, Swapping, Contiguous Allocation, Paging, Segmentation
- **Virtual Memory:** Background, Demand Paging, Page Replacement, Page Replacement Algorithms: FIFO, LRU, OPTIMAL.

UNIT: III

[25%]

- **File Management:**
File concept, Access method, Directory structure, Disk Space Management - Contiguous allocation, Non contiguous allocation, File related system services
- **Security:**
The Security Problem, Authentication, One-Time Passwords, Program Threats, System Threats, Threat Monitoring, Encryption, Computer –Security Classification

UNIT: IV

[25%]

- **Shell Programming:**

Features of Unix, Types of shell, Unix commands: cat, grep family, cut, paste, tr, history, date, cal, who, echo, directory command, file commands, head, tail, sort, bc, ftp, ping, Unix file system: inodes, data blocks, boot block, super block, Editors of Unix shell programming (Vi / PICO), Shell programming: variable, conditional instruction, expr, argument, redirection, looping.

- **Case Studies:** Unix and Windows NT

Reference Books:

- (1) Operating System Concept by Silberschatz & Galvin - Wiley, Fifth Edition
- (2) Operating System, Second Edition by Milan Milenković - TMH
- (3) Operating System, Fourth Edition by William Stallings - PHI
- (4) Unix Shell Programming, by Yashavant Kanetkar - BPB
- (5) Unix Concepts and Applications by Sumitabha das -TMH

Question Paper Scheme:

University Examination Duration: 3 Hours.

Section-I

- Q.1 - Unit-I & II (11 Marks)
Objective/ Short Questions
- Q.2 - Unit-I (12 Marks)
Descriptive/ Long questions
- Q.3 - Unit-II (12 Marks)
Descriptive/ Long questions

Section-II

- Q.4 - Unit-III & IV (11 Marks)
Objective/ Short Questions
- Q.5 - Unit-III (12 Marks)
Descriptive/ Long questions
- Q.6 - Unit-IV (12 Marks)
Descriptive/ Long questions

Note: Options should be given in all questions

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