

**DETAILED SYLLABUS  
FOR  
MASTER IN COMPUTER APPLICATIONS (MCA)  
(FOR BATCH 2002-2005)**



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**MASTER IN COMPUTER APPLICATIONS (MCA)  
SCHEME FOR THE BATCH 2002-2005**

**SEMESTER-I****THEORY PAPERS:**

1MCA1-FUNDAMENTAL OF INFORMATION TECHNOLOGY  
 1MCA2-DIGITAL ORGANISATION  
 1MCA3-PROGRAMMING IN 'C'  
 1MCA4-PRINCIPLES OF MANAGEMENT  
 1MCA5-DISCRETE MATHEMATICS

**PRACTICALS & SESSIONALS:**

1MCA6-COMPUTER LAB  
 1MCA7-INTERNAL ASSESSMENT & TERM WORK

**SEMESTER-II****THEORY PAPERS:**

2MCA1-COMPUTER ARCHITECTURE  
 2MCA2-PROGRAMMING IN VISUAL BASIC  
 2MCA3-DATA STRUCTURES AND ALGORITHMS USING C  
 2MCA4-COMPUTER ORIENTED NUMERICAL METHOD  
 2MCA5-PRINCIPLES OF PROGRAMMING LANGUAGES

**PRACTICALS & SESSIONALS:**

2MCA6-COMPUTER LAB  
 2MCA7-INTERNAL ASSESSMENT & TERM WORK

**SEMESTER-III****THEORY PAPERS:**

3MCA1-DATABASE MANAGEMENT SYSTEM  
 3MCA2-CLIENT SERVER TECHNOLOGY WITH ORACLE  
 3MCA3-OBJECT ORIENTED PROGRAMMING IN C++  
 3MCA4-COMPUTER NETWORKS  
 3MCA5-OPERATING SYSTEMS

**PRACTICALS & SESSIONALS:**

3MCA6-COMPUTER LAB  
 3MCA7-INTERNAL ASSESSMENT & TERM WORK

**SEMESTER-IV****THEORY PAPERS:**

4MCA1-WINDOWS NT ADMINISTRATION  
 4MCA2-JAVA  
 4MCA3-INTERNET AND E-COMMERCE  
 4MCA4-LINUX AND WEB SERVER ADMINISTRATION  
 4MCA5(A)-THEORY OF COMPUTATION  
 4MCA5(B)-MICROPROCESSOR AND ASSEMBLY LANGUAGE PROGRAMMING  
 4MCA5(C)-ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM

**PRACTICALS & SESSIONALS:**

4MCA6-COMPUTER LAB  
 4MCA7-INTERNAL ASSESSMENT & TERM WORK

**SEMESTER-V****THEORY PAPERS:**

5MCA1-COMPONENT ARCHITECTURE AND PROGRAMMING (COM, DCOM)  
 5MCA2-COMPUTER GRAPHICS  
 5MCA3-SOFTWARE ENGINEERING  
 5MCA4-PROGRAMMING IN VC++  
 5MCA5(A)-HARDWARE MAINTENANCE  
 5MCA5(B)-MULTIMEDIA AND VIRTUAL REALITY  
 5MCA5(C)-DATA WAREHOUSING AND MINING  
 5MCA5(D)-PRINCIPLES OF COMPILER DESIGNING

**PRACTICALS & SESSIONALS:**

5MCA6-COMPUTER LAB  
 5MCA7-INTERNAL ASSESSMENT & TERM WORK

**SEMESTER-VI**

6MCA1-MAJOR PROJECT  
 6MCA2-INTERNAL ASSESSMENT & TERM WORK

## **DETAILED SYLLABUS OF MCA YEAR 2002-2005**

### **1MCA-FUNDAMENTAL OF INFORMATION TECHNOLOGY**

#### **UNIT-I**

Computer system concept, computer system characteristics, capabilities and limitations, types of computers – analog, digital, hybrid, general, special purpose, micro, mini, mainframe, super. generations of computers, personal computer (PC) - IBM PC, characteristics, PC/PCXT/PCAT - configurations, Pentium and newer PC specifications and main characteristics. Types of PC- desktop, laptop, notebook, palmtop, workstations etc, their characteristics, add on cards on PC : sound card, video card, network card etc.

Basic components of a Computer System - Control Unit, ALU, Input / Output functions and Characteristics, Memory – RAM, ROM, EPROM, PROM and other types of memory.

#### **UNIT-II**

Input devices-Keyboards, Mouse, Trackball, Joystick, Digitizing Tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light Pen, Touch Screen – Working Principles, Areas of use & characteristics.

Output Devices – Monitors, Characteristics and Types of Monitor – Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard – VGA, SVGA, XGA etc.

Printers - Daisy Wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter

Storage Devices –Fundamentals, Primary Vs Secondary, Data Storage and Retrieval Methods - Sequential, Direct and Index Sequential, Various storage devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks(Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive.

#### **UNIT-III**

Need, Types of Software - System Software, Application Software, System Software - Operating System, Utility Program, Programming Languages, Assemblers, Compilers and Interpreter, Operating Systems - Functions, Types - Batch, Single, Multiprogramming, Multiprocessing, Programming Languages- Machine, Assembly, High

Level, 4GLs, Their merits and demerits, Application Software – Word Processing, Spreadsheet, Presentation Graphics, Data Base Management Software, Characteristics, Uses and examples and area of applications of each of them.

Virus, Types of Viruses, Virus detection and prevention Viruses on Network. Introduction to Multimedia.

#### **UNIT-IV**

Data communication and networks, Types of Network – LAN, WAN, MAN, Networks Models – Client Server, Peer - to - Peer, Intranet, Internet. Topologies of LAN - Ring, Bus, Star, Mesh and Tree Topologies, Components of LAN – Cable & Wireless Media, Network Interface Card Hub, Routers, Repeater . Communication Protocols. Analog and Digital Signals. Modem - Working and characteristics, Types of connections - Dialup, Leased Lines, ISDN

#### **UNIT-V**

Programming techniques Various Stages in Program development . Algorithms, Flow Charts - Symbols, Rules for Making Flow Chart, Types of Flow-Chart, Advantage & disadvantage, Pseudo codes, Programming Techniques – Top Down, Bottom up, Modular, Structured - Features, Merits & demerits, Comparative study. Programming Logic- Simple, Branching, Looping, Recursion.

#### **TEXT & REFERENCE BOOKS:**

- ❑ **INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY** BY ANURAG SEETHA, RAM PRASAD & SONS, BHOPAL.
- ❑ **COMPUTERS TODAY** BY S.K.BASANDRA, GALGOTIA PUBLICATIONS.
- ❑ **FUNDAMENTALS OF INFORMATION TECHNOLOGY** BY ALEXIS LEON & MATHEWS LEON, VIKAS PUBLISHING HOUSE, NEW DELHI.

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**1MCA2-DIGITAL ORGANISATION****UNIT-I**

Data representation Data Types and Number Systems, Binary Number System, Octal & Hexa-Decimal Number System, Fixed Point Representation, 1's & 2's Complement, Binary Fixed- Point Representation, Arithmetic Operation on Binary Numbers, Overflow & Underflow, Floating Point Representation, Codes, ASCII, EBCDIC Codes, Gray Code, Excess-3 & BCD, Error Detection & Correcting Codes Binary Storage and Registers.

**UNIT-II**

Boolean algebra and digital logic circuits -Logic Gates, AND, OR, NOT Gates and their Truth Tables, NOR, NAND & XOR Gates, Boolean Algebra, Basic Definition and Properties, Basic Boolean Law's, Demorgan's Theorem Map Simplification, Minimization Techniques, K Map – Two, Three and More variables maps, Sum of Product & Product of Sums, Don't care conditions, Combination & Sequential Circuits, Half adder & Full adder, Full subtractor, Full subtractor and decimal adder, Code Conversion, Multilevel NAND and NOR Circuits, Multiplexers and Demultiplexers, RAM and ROM Working & Circuit

**UNIT-III**

Sequential logic- Flip-Flops - RS, D, JK & T Flip-Flop, Triggering in flip flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, flip flop excitation tables, Design procedure and design of counters. Design with equations, Registers, Counters and the memory unit, Shift registers, Ripple counters and Synchronous counters, Timings sequence digital logic families.

**UNIT-IV**

Registers transfer logic, Intel Register Transfer, Arithmetic Logic and Shift Micro Operation, Conditional, Constant Statement, Fixed Point Binary Data Floating Point Data, Instruction Codes.

Input-output organizations- I/O Interface, Properties of simple I/O Devices and their controller, Isolated Vs Memory-mapped I/O, Modes of data transfer, Synchronous & Asynchronous data transfer

**UNIT-V**

Memory organization - Auxiliary Memory, Magnetic Drum, Disk & Tape, Semi-conductor memories, memory, Hierarchy, Associative memory, Virtual memory, Address space & memory space, Address mapping, page table, Page replacement, segmentation, Cache memory, Hit ratio, Mapping techniques, Writing into cache .

**TEXT & REFERENCE BOOKS:**

- ❑ COMPUTER SYSTEM ARCHITECTURE BY MORRIS MANO
- ❑ DIGITAL LOGIC AND COMPUTER DESIGN BY MORRIS MANO

**1MCA3-PROGRAMMING IN 'C'****UNIT-I**

Overview of C, Feature of C, Structure of program, Variables, Expression, Identifiers, Keywords, Data types, Constants.

Operator: Arithmetic, Logical, Relational, Conditional and Bitwise operators, Precedence and associativity of operators, Types conversion in expression

Basic input/output and library functions Single Character Input/Output i.e. getch(), getchar(), getche(), putchar(), Formatted input/output i.e. printf() And scanf(), Library Functions – concepts mathematical and character functions.

Control structures- If Statement, If.....Else Statement, Nesting Of If .....Else Statement, Else If Ladder, ? : Operator, Switch Statement, Compound Statement, Loop Controls – For, While, Do-While Loops, Break Continue, Exit, Goto Statement .

**UNIT-II**

The Need of a Function, User Defined and Library Function, Prototype of a Function, Function Argument, Return Values and Nesting of Function, main(), Command Line Argument, Recursion, Calling of Functions, Array as Function Argument, Scope and Life of Variables - Local and Global Variable, Storage Class specifier – Auto, Extern, Static, Register, Preprocessor Directive.

**UNIT-III**

Arrays-Single And Multidimensional Arrays, Array Declaration And Initialization Of Arrays, String : Declaration, Initialization, String Functions

Structure and union-Defining Structure, Declaration Of Structure Variable, Accessing Structure Members, Nested Structures, Array Of Structures, Structure Assignment , Structure As Function Argument, Function That Return Structure, Union

**UNIT-IV**

Pointers- The & And \* Operators, Pointers expressions, Pointers V/s Arrays, Pointer to functions, Functioning returning pointers.

Dynamic memory allocation Introduction, Malloc, Calloc, Sizeof, Free, Ralloc Functions

Bitwise operator

**UNIT-V**

File management-Defining, Opening a File & Closing a File, Text file, Binary file, Functions for File Handling: fopen, fclose, gets, puts, fprintf, fscanf, getw, putw, fputs, fgets, fread, fwrite, Random access to files : fseek, ftell, rewind, file name as Command Line Argument.

Graphics on your PC, Initialize Graphics Mode, Functions used In Graphics - Drawing a Point on The Screen, Drawing – lines, rectangle, ovals, circles, arcs, polygon, filling colors, Using Text in Graphics Display.

**TEXTS & REFERENCE BOOKS:**

- ❑ **PROGRAMMING IN C** BY E. BALAGURUSWAMI, TMH PUBLICATIONS
- ❑ **PROGRAMMING WITH C** BY GOTTFRIED, SCHAUMS OUTLINE SERIES, TMH PUBLICATIONS
- ❑ **THINKING IN C** BY MAHAPATRA, PHI PUBLICATIONS
- ❑ **GRAPHICS PROGRAMMING IN C** BY STEVENS, BPB PUBLICATION
- ❑ **PROGRAMMING IN C** BY R SUBBURAJ, VIKAS PUBLISHING

**1MCA4-PRINCIPLES OF MANAGEMENT****UNIT-I**

Management practices- Meaning and Functions, Development of Management Thought, F. W. Taylor And Henry Fayol's Theories of Management, Qualities of an Efficient Management, Management Principles Of Modern Times (Empowerment, Kaizen, Quality Circles, Total Quality Management).

**UNIT-II**

Planning -Plan, policies, strategies and programs, steps in planning & decision making, forecasting, qualities of an effective planner, relevant case study

**UNIT-III**

Organizing-Organizational Design, Organizational Structure, Centralization & Decentralization, Delegation, Gantt chart and PERT/CPM, Relevant Case Study

**UNIT-IV**

Directing-Motivation and team building, theories of motivation, factors affecting motivation. Leadership, leadership styles, theories of leadership, qualities of a effective leader, effective communication and presentation skills, relevant case studies.

**UNIT-V**

Controlling Meaning and basic principles, types of controls, budget and budgetary control, inventory control and quality control, relevant case studies.

**TEXTS & REFERENCE BOOKS:**

- ❑ ESSENTIALS OF MANAGEMENT BY H. KOONZ & H. WEHRICH TMH PUBLICATION
- ❑ PRINCIPLES OF MANAGEMENT BY O.P. KHANNA

**1MCA5-DISCRETE MATHEMATICS****UNIT- I**

Sets & preposition - Introduction, combinations of sets, finite and infinite sets, unacceptable indefinite sets, principles of inclusion and exclusion, propositions.

Relations and functions- introduction, a relation model for database. Properties of binary relations. Equivalence relations and lattices, partial ordering relations and lattices. Chain and antichains, a job scheduling problems and the pigeonhole principles.

**UNIT- II**

Recurrence relations and recursive algorithm-Introduction, Recurrence, Relations, Linear Recurrence With Coefficient Solutions, particular solutions, Total Solutions.

**UNIT-III**

Groups and ring-Groups and Subgroups, Generators and Evaluations of Powers, Cosets and Lagrange Theorem, Permutation, Groups and Codes, Isomorphism and Automorphisms, Homomorphism and Normal Groups, Rings, Integral Domains and Fields, Polynomial Ring and Cyclic Codes.

**UNIT- IV**

Boolean algebra's-Lattices and Algebraic System, Principles of Duality, Basic Properties of Algebra's of System, Defined by Lattices, Distributive and Complemented Lattices, Boolean Lattices and Boolean Algebra's. Uniqueness Finite Boolean Algebra's. Boolean Functions and Boolean Expressions, Propositional Calculus.

**UNIT-V**

Finite state machines-Introduction, Finite State Machines, Finite State Machine as Model of Physical System, Equivalent Machines, Finite State Machine as Language Recognizers.

**TEXTS & REFERENCE BOOKS:**

- ❑ ELEMENTS OF DISCRETE MATHEMATICS BY C.L.LIU-MCGRAW-HILLS PUB.
- ❑ APPLIED DISCRETE STRUCTURE FOR COMPUTER SCIENCE BY ALAN DOERR AND KENNETH LEVASSUR-GALGOTIA PUBLICATION

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**2MCA1-COMPUTER ARCHITECTURE****UNIT-I**

Introduction to organization and architecture System Buses : Computer Components, Computer Function, Interconnection Structures, Bus Interconnection, PCI.

Input/Output - External Devices, I/O Modules, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access, I/O Channels and Processors

The External Interface.

**UNIT-II**

Computer memory, Internal memory - Computer Memory System Overview, Semiconductor Main Memory, Cache Memory, Advanced DRAM Organization.

External Memory - Magnetic Disk, RAID, Optical Memory, Magnetic Tape

Computer Arithmetic and Instruction - The Arithmetic and Logic Unit ( ALU ), Integer Representation, Integer Arithmetic, Floating – Point Representation, Floating-Point Arithmetic.

**UNIT-III**

Instruction sets Characteristics and Functions, Machine Instruction Characteristics, Types of Operands, Types of Operations, Assembly Language

Instruction Sets : Addressing Modes and Formats, Addressing, Instruction Formats

**UNIT-IV**

CPU structure and function Processor Organization, Register Organization, The Instruction Cycle, Instruction Pipelining,

The Pentium Processor, The PowerPC Processor

**UNIT-V**

Reduced instruction set computers (RISC), Instruction Execution Characteristics, Reduced Instruction Set Architecture

Control Unit Operation - Micro - operations, Control of the CPU, Hardwired Implementation

**TEXTS & REFERENCE BOOKS :**

- ❑ **COMPUTER ORGANIZATION AND ARCHITECTURE** BY WILLIAM STALLINGS TMH PUBLICATION
- ❑ **COMPUTER SYSTEM ARCHITECTURE:** BY M. MORRIS MANO
- ❑ **DIGITAL LOGIC AND COMPUTER DESIGN** BY M. MORRIS MANO



**2MCA2-PROGRAMMING IN VISUAL BASIC****UNIT-I**

Integrated Development Environment of VB, User Interface Designing, Basics of Event driven programming.

Form- Designing, Showing & Hiding

VB language -Data Types, Variables & Constant, Arrays, Dynamic Arrays, Array as function, Collections, Procedures, Arguments passing, Functions, Returning Values. Control flow Statements: if-then, if-then-else, Select case, looping statement: Do-Loop, For-Next, While-Wend, Nested Control Structure, Exit statement.

**UNIT-II**

Basic Active X Control, Properties & Methods - Text box, List box, combo box, Scroll bar, Slider & Fire Controls. Advance Active X Control - Common Dialog controls, Color, font, File open, file save, print help, tree View & list View Controls.

Graphics controls - ImageBox & PictureBox, Coordinate System, Graphics methods- Text Drawing, Lines & Shape, Filling Shapes, Grid methods

Menu editor: Pull-down, Pop-up and Dynamic menus

**UNIT-III**

Multiple Document Interface - Parent & Child Forms & Methods.

OLE - Basics, OLE control Properties & Methods, Developing applications with OLE control, OLE at Runtime.

Error handling in VB - Types of Errors, Error handling methods and functions

**UNIT-IV**

Database Programming with VB – Database Models, Visual data manager, DATA Control- methods, Properties, Connectivity with database, DATA bound controls

RDO Data control, creating & using database with object model.

ADO data control, creating & using database with object model, Attaching Queries with database.

DATA Report Designer

**UNIT-V**

Visual Basic & Internet programming- HTML Pages Basics, Server Client Interactions, DHTML Basics, Accessing Internet in VB using Web browser control and Internet Explorer Object.

Introduction to VB SCRIPT

**TEXTS & REFERENCE BOOKS:**

- ❑ **SPECIAL EDITION USING VISUAL BASIC 6.0** BY BRIAN SILER PRENTICE HALL(2000)
- ❑ **MASTERING VISUAL BASIC 6** BY EVANGELOS PETROUTSOS BPB PUBLICATIONS
- ❑ **BEGINNER'S GUIDE TO VISUAL BASIC 6** BY REETA SAHOO & G.B. SAHOO, KHANNA PUBLISHING HOUSE
- ❑ **PETER NORTON'S GUIDE TO VISUAL BASIC 6** BY PETER NORTON
- ❑ **BEGINNING VISUAL BASIC 6** BY PETER WRIGHT, SHROFF PUBLISHERS
- ❑ **PROGRAMMING IN VISUAL BASIC 6.0** BY MOHAMMED AZAM, VIKAS PUBLISHING HOUSE
- ❑ **VISUAL BASIC 6 SUPER BIBLE** BY DAVID JUNG, BOUTAIN, PARDUM, TECHMEDIA PUBLICATIONS



**2MCA3-DATA STRUCTURES AND ALGORITHMS USING C****UNIT-I**

Introduction to data structures, Abstract data types

Stacks - Introduction to stack & primitive operation on stack, Stack as an abstract data type, Stack's applications - Infix, post fix & Prefix expressions, Recursion, Multiple stacks

Queues -Introduction to queues, Primitive Operations on the Queues, Queue as an abstract data type, Circular queue, Dequeue, Priority queue.

**UNIT-II**

Linked List - Introduction to the Linked List, Operation on Linked List, Linked List representation of stack and Queue, Header nodes.

Types of Linked List - Doubly Linked List, Circular Linked List

Application of Linked List.

**UNIT-III**

Trees -Basic Terminology of Trees, Binary Trees, Tree Representations as Array & Linked List

Binary tree representation, Traversal of binary trees - In order, Preorder & post order, Application of Binary tree, Threaded binary tree

Balanced tree, AVL tree, B-tree, B+ & B\* trees, Conversion of General Tree to Binary Tree, Counting Binary Trees, 2-3 Trees, algorithm for manipulating 2-3 Trees.

**UNIT-IV**

Searching - Sequential Searching, Binary search and their Comparison.

Sorting - External & Internal sorting, Insertion sort, Selection sort, Quick sort, Bubble sort, Heap sort, Merge sort, Comparison of sorting methods Algorithms of sorting and searching in Linked list and Arrays.

**UNIT-V**

Tables - Hash table, Collision resolution Techniques.

Graphs - Introduction to graphs, Basic Terminology, Directed, Undirected & Weighted graph, Representation of graphs, Warshall's algorithm for path matrix and shortest path

Graph Traversals-Depth first & Breadth first search.

Spanning Trees, minimum spanning Tree, The basic Greedy Strategy for computing Algorithm of Kruskal, and Prim

Applications of Graphs : Shortest path and Longest Path Problems.

**TEXTS & REFERENCE BOOKS:**

- ❑ **FUNDAMENTALS OF DATA STRUCTURE** BY S. SAWHNEY & E. HOROWITZ
- ❑ **DATA STRUCTURE** BY TREMBLAY & SORRENSON
- ❑ **DATA STRUCTURE** SCHAUM'S OUTLINE SERIES, MCGRAW HILL PUBLICATION

**2MCA4-COMPUTER ORIENTED NUMERICAL METHOD****UNIT-I**

Solving Non linear Equations - Computer & Arithmetic Errors, Method of Bisection, The Secant Method, Newton – Raphson Method, Newton's Method for Polynomial, Horner's Method, Muller's Method Order of Convergence of other method.

**UNIT-II**

Solving sets of Equations - Matrix Notation, Determinants and Matrix inversion, Norms, The Elimination Method, Gauss and Gauss-Jordan Method, Iterative Method.

**UNIT-III**

Interpolation - Forward Differences, Lagrangian Polynomial, Divided Differences for a Polynomial Error of Interpolation, Least Square Approximation.

**UNIT-IV**

Numerical Differentiation and Integration - Derivatives from difference table, High order Derivatives, Extrapolation Techniques, Newton cotes Integration Formula, The trapezoidal Rule, Simpson's Rule.

**UNIT-V**

Numerical Solution of Ordinary differential Equations - The Taylor-series Method, Euler and Modified Euler Methods, Runge-Kutta Method

**TEXT & REFERENCE BOOKS:**

- ❑ **APPLIED NUMERICAL ANALYSIS(VTH EDITION) BY F.GERALD, PITRICK O.WHEATLEY**

**2MCA5-PRINCIPLES OF PROGRAMMING LANGUAGES****UNIT-I**

Criteria for the design of a good programming language, Defining Syntax - The character Set, BNF, Syntax Graphs, Syntax and Program Reliability

Variables, Expressions and statements - Variables and the Assignment statements, Binding time & the Storage Allocation, Constants and Initialization, Expressions, Conditional statements, Iterative Statements, The GOTO Statements and Labels.

**UNIT-II**

Data types and Typing, Enumerated Data types, Elementary Data types, Type Coercion, Type Equivalence, Binding Scope and Extent Revisited.

**UNIT-III**

Procedures - General Features, Parameter Evaluation and Passing, Call-by-name, Call by value, Call by reference, Call by text, Specifications of Objects in a Procedure, Aliasing, overloading, Generic Functions, overloading, Generic Functions, Coroutine, Data Abstraction.

**UNIT-IV**

Concurrency - Basic Concepts, Monitors, Message Passing, Concepts of Input - output.

Functional Programming - The Basics of LISP, The LIST Interpreter, FUNARGs and FEXPRs, the PROG Features, Data Flow, Programming Languages, The Data Flow Model, and Language Design Goals.

**UNIT-V**

Object Oriented Programming Language - Object Oriented Programming Concepts, Object Oriented Programming Compared to Traditional Programming Objects, Messages, Methods and Classes. Control Structures, Classes Compared to Abstract Data Type, Inheritance and Polymorphism.

**TEXT & REFERENCE BOOKS:**

- ❑ FUNDAMENTAL OF PROGRAMMING LANGUAGE BY ELLIS HOROWITZ  
GALGOTIA PUBLICATION
- ❑ PROGRAMMING LANGUAGES BY ALLEN B.TUCKER, TMH  
PUBLICATION
- ❑ PROGRAMMING DESIGN BY PETER JULIFF (4<sup>TH</sup> EDITION)
- ❑ CONCEPTS OF PROGRAMMING LANGUAGES BY ROBERT W. SEBESTA :  
LOW PRICED EDITION(4<sup>TH</sup> EDITION)

**3MCA1-DATABASE MANAGEMENT SYSTEM****UNIT- I**

Introduction to database systems-Operational Data, File Management Vs Data Management, characteristics of Database approach, An Architecture for a Database System, Advantages and Disadvantages of DBMS, Data associations - Entities, Attributes and Associations, Relationship among Entities, Representation of Associations and Relationship, Data Model Classification, Entity Relationship Model, Relational Data Model, Network Data Model, Hierarchical Data Model .Objects – Relational Model Objects, Relationship, Composite Objects, Procedures, Types and Inheritance.

**UNIT-II**

Relational data structure-A Review of Set Theory, Relations, Domains and Attributes, Tuples, Keys. Integrity Rules Extensions And Intensions, Base Tables, Indexes Relational Algebra and Operations, Retrieval Operations, Relational Calculus and Domain Calculus,.

**UNIT-III**

Relational database design-Universal Relation, Anomalies in a Database, Normalization Theory, Functional Dependencies. Closure of a Set of F.D Covers, Non Redundant and Minimum Cover, Canonical Cover, First, Second and Third Normal Forms, Relations with more than one Candidate Key, Good and Bad Decompositions, Boyce Codd Normal Form, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

**UNIT-IV**

Query processing-Query Processing Stages, Query Interpretation, Equivalence of Expression, Query Execution Statistics. Query Execution Plan, Query Estimation, Query Evaluation, View Processing, Integrity & Security, Need for Integrity and Security Integrity Constraints.

**UNIT-IV**

The distributed databases -Motivation for Distributed Database . Distributed Database concepts, Types of Distribution Architecture of Distributed Databases, The Design of Distributed Databases,

Distributed Query Processing, Recovery In Distributed Systems, Commit Protocols for Distributed Databases, Multi Database System. Distributed Databases feature in Contemporary Database Management System.

### TEXTS & REFERENCE BOOKS:

- ❑ **AN INTRODUCTION TO DATABASE SYSTEM** (3rd ED.) BY C. J. DATE
- ❑ **DATABASE SYSTEM CONCEPTS** BY HENRY F. KORTH
- ❑ **DATABASE MANAGEMENT SYSTEMS** BY LEON & LEON, VIKAS PUBLICATIONS.
- ❑ **AN INTRODUCTION TO DATABASE SYSTEM** BY BIPIN C. DESAI
- ❑ **FUNDAMENTALS OF DATABASE SYSTEM** (2<sup>nd</sup> ED.) BY ELEMESRI AND S. NAVATHE

## 3MCA2-CLIENT SERVER TECHNOLOGY WITH ORACLE

### UNIT-I

Mainframe architecture, file sharing architecture, client server architecture, Purpose and origin of client server architecture, advantages and disadvantages

Remote procedure calls

Two tire architecture, three tire architecture with transaction, processing and monitor techniques, three tire architecture with application server, message server ORB architecture, distributed / collaborating architecture

Oracle as enterprise database server.

### UNIT- II

Client and server communication (SQL) Data Definition Language (DDL) - Creating, Altering & Dropping Tables, Integrity Constant,

Data Manipulation Language (DML) - Select Insert, Update, Delete Commands

Transaction Control Using SQL - Commit, Rollback, Savepoint Command, Data Controlling Using SQL - Grant, Revoke, Set Role,

SQL functions

Indexes and views

### UNIT- III

PL/SQL, SQL & PL/SQL, Differences, Blocking Code for Clarity, Using Variables, Constant and Data Types, Assigning Data Base Values to Variables, Select Into ..... Cursors using Flow Control and Loop Statements, Goto Statement. Error handling built in PL / SQL Exceptions, User - Defined Exceptions, Unhandled

Exception, the Raise - Application - Error Procedure.

PL / SQL Programs Anonymous PL / SQL Blocks, Stored Procedure, Function & Packages, Using Database Triggers.

**UNIT-IV**

Database Administration, Managing the Database- Creating a new Database Startup & Shutdown Startup Stages Shutdown Stages, Redo Logs, Control files.

Tablespace : Creating Tablespace , Adding Files to Table Space, Increasing The Size Of Database Files, Dropping Tablespace, Using Temporary Segment.

Import & Export

SQL Loader.

**UNIT-V**

Obtaining Object Storage: Oracle Blocks in the Database Files, Segment And Extents, Forcing Additional Extents, managing disk spaces.

Rollback Segment : Creating Additional Rollback Segment, Enabling & Disabling Rollback Segment, Expanding & Monitoring Rollback Segments, Maintaining Rollback Segment

Maintaining database user Accounts : Creating Modifying & Deleting User Accounts, Changing User Passwords

Backup & Recovery

Database security

**TEXTS & REFERENCE BOOKS:**

- ❑ CLIENT SERVER TECHNOLOGY at :  
www.sei.cmu.edu/str/description/index.html
- ❑ ORACLE A BEGINNERS GUIDE BY MICHAEL ABBEY & MICHAEL J. COREY TMH PUBLICATIONS
- ❑ ORACLE & CLIENT/SERVER BY BOBROSKI
- ❑ UNLEASHED ORACLE
- ❑ THE ORACLE COOK BOOK BY LIEBSCHUTY, BPB PUBLICATIONS

**3MCA3-OBJECT ORIENTED PROGRAMMING IN C++****UNIT-I**

Overview Of C++ : Object Oriented Programming, Introducing C++ Classes, Concepts of Object Oriented Programming.

C++ as a superset of C, New style comments, main function in C++, meaning of empty argument list, function prototyping, default arguments and argument matching.

User defined data types: enumerated types, use of tag names, anonymous unions, scope of tag names

Classes & Objects :Classes, Structure & Classes, Union & Classes, Inline Function, Scope Resolution operator, Static Class Members: Static Data Member, Static Member Function, Passing Objects to Function, Returning Objects, Object Assignment. Friend Function, Friend Classes

**UNIT-II**

Array, Pointers References & The Dynamic Allocation Operators: Array of Objects, Pointers to Object, Type Checking C++ Pointers, The This Pointer, Pointer to Derived Types, Pointer to Class Members, References: Reference Parameter, call by reference and return by reference Passing References to Objects, Returning Reference, Independent Reference, C++'S Dynamic Allocation Operators, Initializing Allocated Memory, Allocating Array, Allocating Objects.

Constructor & Destructor : Introduction, Constructor, access specifiers for constructors, and instantiation, Parameterized Constructor, Multiple Constructor in A Class, Constructor with Default Argument, Copy Constructor, Destructor.

**UNIT-III**

Overloading as polymorphism

Function & Operator Overloading : Function Overloading, Overloading Constructor Function Finding the Address of an Overloaded Function, Operator Overloading: Creating A Member Operator Function, Creating Prefix & Postfix Forms of the Increment & Decrement Operation, Overloading The Shorthand Operation (I.E.

+=, -= Etc), Operator Overloading Restrictions, Operator Overloading Using Friend Function, Overloading New & Delete, Overloading Some Special Operators, Overloading [ ], ( ), -, Comma Operator, Overloading << And .

Namespaces: global namespace and namespace std, nested namespaces

#### UNIT-IV

Inheritance : Base Class Access Control, Inheritance & Protected Members, Protected Base Class Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors & Inheritance, When Constructor & Destructor Function are Executed, Passing Parameters to Base Class Constructors, Granting Access, Virtual Base Classes .

Virtual Functions & Polymorphism : Virtual Function, Pure Virtual Functions, Early Vs. Late Binding, Templates and Exception Handling.

#### UNIT-V

Exception handling in C++, try, throw, catch sequence, multiple catch blocks, uncaught exceptions, catch-all exception handler

Templates: Reason for templates compactness and flexibility, function template examples explicit specialization, class templates, out of class definition of member functions

The C++ I/O System Basics : C++ Streams, The Basic Stream Classes C++ Predefined Streams, Formatted I/O: Formatting Using The Ios Members, Setting The Format Flags, Clearing Format Flags, An Overloaded Form Of Setf ( ), Using Width() Precision() and Fill(), Using Manipulators to Format I/O, Creating Your own Manipulators.

#### TEXT & REFERENCE BOOKS:

- ❑ C++ THE COMPLETE REFERENCE BY HERBERT SEHILDT - TMH
- ❑ C++ BY BALGURUSWAMI – TATA MCGRAW HILLS
- ❑ C++ BY M. KUMAR, TATA MCGRAW HILLS

### 3MCA4-COMPUTER NETWORKS

#### UNIT-I

Analog & Digital signal. Electromagnetic spectrum, Asynchronous & Synchronous Transmission. Ideal channel, Band rate, Base band broad band channel, Multiplexer FDM, TDM, STDM, Carrier, Modulation, AM, FM, PCM, PwM, SWM, Encoding, Schemes, The needs and importance of networking, type of network, server based, peer based, hybrid, layered Architecture, LAN Topology. Network adopted card, logical topology. Modem

#### UNIT-II

Switching technique, message switching, circuit switching, packet switching, virtual circuit, transmission media, OSI reference model, IEEE standards, 802.3, 802.4, 802.5 ALOHA, SLOTTED ALOHA, CSMA, CSMA/CD Bimap CCITX.25, CCITT x.11 Token ring, Token bus.

#### UNIT-III

Fast Ethernet, FDDI Token ring, Wireless LAN, ATM Network, Principles of Internetworking Internetworking devices, Bridge, Routers Gateways, repeater, routing algorithms, distance vector routing, shortest path routing, Broadcast routing, Multicast routing, ICP/IP Protocol, IPV6 addressing, congestion control, Traffic Shapping.

#### UNIT-IV

TELNET, FTP, SMTP, MIME, SNMP, UDP, URL (Uniform Resource Locator) THTTP Source routing Bridge, Transport Bridge, ISDN Channel, ISDN services, base band ISDN, broadband ISDN.

#### UNIT-V

Different switches, PBX network, network securing application of cryptography to security, Data Encryption Transposition cipher, substitution cipher, PSA Algorithms, EDI layout Architecture, Function of Network operating system. Client OS, Server OS, idea about PSNT.

**TEXT & REFERENCE BOOKS:**

- ❑ **COMPUTER NETWORKING** BY ANDREWS TANANBAUM
- ❑ **UNDERSTANDING DATA COMMUNICATION OF NETWORKING** BY WILLIAM A SHAY
- ❑ **COMMUNICATION AND NETWORK** BY LEWIS MACHENZIE
- ❑ **DATA COMMUNICATION** BY PRAKASH C GPTA
- ❑ **DATA AND COMPUTER COMMUNICATION:** BY WILLIAM STALLINGS

**3MCA5-OPERATING SYSTEMS****UNIT- I**

Definitions, Components and types of Operating system,

Operating System Services, System Calls, System Programs, System Structure, System Design and Implementation, System Generations.

**UNIT-II**

Process Concepts, Process State & Process Control Block, Process Scheduling, Scheduling, Criteria, Scheduling Algorithms, Multiple-Processor Scheduling Real-Time Scheduling.

The Critical Sections Problem

**UNIT-III**

Semaphores, Classical Problem of Synchronization, Monitors, Atomic Transactions, System Model, Deadlock Characterizations, Method for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Combined Approach to Deadlock.

**UNIT-IV**

Storage management Logical Versus Physical Address Space, Swapping, Contiguous Allocating, Paging, Segmentation, Segmentation With Paging, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement, Page Replacement Algorithms, Allocation of Frames

**UNIT-V**

Thrashing, Demand Segmentation

I/o system Overview, I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Performance, Disk Structure, Disk Scheduling, Disk Management, Swap Space Management, Disk Reliability, Stable Storage Implementation.

**TEXT & REFERENCE BOOKS :**

- ❑ **OPERATING SYSTEM CONCEPTS** BY SILBERSCHATZ & GALVIN, ADDISON WESLEY PUBLICATION
- ❑ **OPERATING SYSTEM CONCEPTS & DESIGN** BY MILAN MILEN KOVIC, TMH PUBLICATION



**4MCA1-WINDOWS NT ADMINISTRATION****UNIT-I**

Introduction to Windows NT, Various Features, Differences with other Windows Environment and other O.S., Windows NT workstations Versus Server.

Kernel and its Subsystems: Kernel/User Mode, Win32 Subsystem.

Security Models: System level restrictions, Server application security, Domain group access, Right and privilege verification, Application Support- Windows and Non Windows applications.

Installation: Requirement Analysis, Basic Hardware required, Workgroup and Domain concepts: PDC, BDC.

Network Configuration : Selecting NIC, Installing NIC driver, Choosing protocols and services

**UNIT-II**

NT Administration: User manager for domain, Disk administration, Backup, System policy editor, Remote access administration, Network clients administration.

Control panel- Start and stops services from control Panel, Adding/ Removing Hardware and Software with control panel.

Windows NT File systems: Physical file organization, Basic File systems: FAT, NTFS, CDFS, HPFS, The FAT file systems, The NTFS file systems, File systems Integrity and recoverability, File compression.

**UNIT-III**

Networking with TCP/IP: TCP/IP services in NT, Advantages of using TCP/IP in NT, TCP/IP installation and configuring DHCP and WINE services.

Remote Access Service: Remote access clients and servers, Installing and configuring Remote Access Server, Administration of RAS.

**UNIT-IV**

Setting and running up a web server – Windows NT web server - Internet Information Server, IIS setup, setting up a web site, Virtual

directories, Virtual Web Sites. Administration of Web Server with ISM.

Windows NT Registry – Registry working, Necessity of registry, Registry Database layout, Registry Editor and its working.

Diagnosis and troubleshooting NT hardware and software installation problems, startup problems, problems with Logon, accounts & password, Network HW and SW problems, performance problems. NT diagnostic tools: WINMSD, Network Monitor.

**UNIT-V**

HAL, Kernel and Executive: Hardware Abstraction Layer (HAL), Kernel – Kernel objects and Threads, NT Executives – I/O Manager and Device Drivers, Process Manager, Virtual Memory Manager, Object manager, LPC facility, Security Reference Monitor.

Protected Subsystems: NT Subsystem's working, Win32 Subsystem-difference between Win16 & Win32, Testing and Queuing Model, Win32 Programming Support, Windows on Windows- Starting win16 programs, Multitasking with WOW VDM, Thunking 16-bit to 32-bit runtimes, Interprocess Communication (IPC), MSDOS Emulation Layers.

Device Drivers: Windows device scheme, NT Drivers Models- Service Control Monitor, Kernel Mode, User modes, Virtual device mode, Driver requirements and operations.

**TEXTS & REFERENCE BOOKS:**

- ❑ **The Complete Reference: Windows NT 4** - Griffith Wm. Kadnier - Tata McGraw Hill. ISBN - 0-07-463222-1.
- ❑ **Windows NT 4 Unleashed** - Robert Cowart - Techmedia (BPB Publications), ISBN- 81-7635-074-5.
- ❑ **Windows NT Server 4: MCSE Training Guide** - Joe Casad, Wayne Dalton - Techmedia (BPB Publications), ISBN - 81-87105-45-3

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## 4MCA2-JAVA

**UNIT-I**

History and design features of JAVA, how java works, basics of JAVA, Applications and Applets, using the tools in JDK, javadoc, java, jdb etc.

Applet Programming - Creating and executing Java applets, inserting applets in a web page, Java security.

**UNIT-II**

JAVA Language- Keywords, Constants, Variables, and Data Types. Operators and Expressions, Decision making, Branching and Looping, Labeled Loops Statement, Jump statements: Break, Continue, and Return. Arrays and Strings-Creating an Arrays, one and two Dimension Arrays, String Array, String and String Buffer Classes, Wrapper Classes.

Classes, Objects and Methods Defining a class, adding variables and Methods, creating objects constructors, class inheritance

**UNIT-III**

Inheritance, Basics types, using super, multi level hierarchy, abstract and final classes, object class, packages and interfaces, Access protection, Extending interfaces, packages.

Exception Handling, Fundamentals exception types, uncaught exceptions, throws, throw, try -catch, final, built in exceptions, creating your own exceptions.

Multithreading Fundamentals, Java Thread model : priorities, synchronization, messaging, thread class, Runnable interface, Interthread communication, suspending, resuming and stoping threads.

**UNIT-IV**

Input/Output -Basics, Streams, Byte and Character streams, predefined streams, reading and writing from console and files .Using standard Java Packages (lang,util,io)

Networking -Basics, networking classes and interfaces, using java.net package, doing TCP/IP and Datagram programming.

**UNIT-V**

AWT Classes, Event Handling and Swing classes, AWT Programming, Working with windows, Graphics and Text, using AWT controls, Layout managers and menus, Handling image, animation, sound and video.

Event Handling-Different mechanism, the Delegation Event Model, Event Classes, Event Listener interfaces, Adapter and Inner Classes.

Java Swing -Japplet, Icons and Labels, Text fields, Buttons, Combo Boxes, Tabbed and Scroll Panes, Trees, Tables.

**UNIT-VI**

JDBC -Setting the JDBC connectivity with a backend database.

RMI -Two tier and Multitier Architecture, Object serialization, RMI Fundamentals, Programming using Java RMI Classes and interfaces .

Servlets-Background, Life Cycle, Java Servlet Development kit, Servlet API, Handling HTTP Requests and responding, Using Cookies, Session Tracking and security issues.

**TEXTS & REFERENCE BOOKS :**

- ❑ **JAVA THE COMPLETE REFERENCE** BY PATRICK NAUGHTON AND HERBERT SCHIELDT.
- ❑ **PROGRAMMING WITH JAVA** BY E. BALAGURUSWAMY.
- ❑ **USING JAVA 1.2** BY JOSEPH WEBER.

**4MCA3-INTERNET AND E-COMMERCE****UNIT-I**

ELECTRONIC COMMERCE -Technology & Prospects, Internet Commerce Architecture, Internet Based E-Commerce : Issues, Problems & Prospects.

STRUCTURE OF ASP APPLICATION -Objects, Component, Integrating objects & components into ASP, Response Object, Request Object.

**UNIT-II**

HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of font size & Attributes

List types and its tags, Use of Frames and Forms in web pages, ASP & HTML Forms.

**UNIT-III**

Javascript Overview, Javascript and the WWW, Javascript vs. VBScript, Javascript vs. Java, Javascript versions, Script element, Inline Javascript, Including Javascript.

Functions : Functions introduction, Calling functions,

Javascript Comments : Comments overview, When to comment, Types of comments

Variables : Variables overview, Declaring variables, Types of variables, Casting variables, Alert box

Expressions : Arithmetic operators, Assignment operators, Logical operators, Expressions and precedence

Statements : If statement, For statement, While statement, Break/Continue

**UNIT-IV**

Working with asp application -Application Concept, Application & the Global.asa file using Application object & variables

USING ACTIVE SERVER PAGES WITH DYNAMIC HTML-Client-Side Form Validation

Working with the file system - Reading and Writing to a File, Working with Files, Working with Drives and Folders

**UNIT-V**

Using asp with databases -Creating Connections with OLE DB and ODBC Connecting to Microsoft Access Database, Executing a SQL Statement with the connection object, Advanced Methods & Properties of connection object

Working with Recordsets - Retrieving a Recordset, Recordset Cursor and Locking Types, Advanced Methods and Properties of the Recordset Object

Generating Dynamic Content From the Server - Detecting Browser Properties, Using the Content Rotator Component, The Content Linking Component

Case Study on creating a Job Site

**TEXTS & REFERENCE BOOKS :**

- ❑ **ACTIVE SERVER PAGES 2.0 (UNLEASHED)** BY STEPHEN WALTHER : TECHMEDIA
- ❑ **ASP 3 PROGRAMMING BIBLE** BY ERIC A. SMITH : IDG BOOKS(REPRINT2001)
- ❑ **TEACH YOURSELF ASP 3.0 IN 21 DAYS** BY SCOTT MITCHELL, JAMES ATKINSON : TECHMEDIA (1<sup>ST</sup> EDITION 2000)
- ❑ **MASTERING ACTIVE SERVER PAGES 3.0** BY RUSSELL JONES : BPB(1<sup>ST</sup> EDI 2000)

## 4MCA4-LINUX AND WEB SERVER ADMINISTRATION

### UNIT – I

Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell.

Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, more, less, creating and viewing files, using cat, file comparisons, View files, disk related commands, checking disk free spaces.

Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down.

### UNIT-II

Essential linux commands Understanding shells, Processes in linux-process fundamentals, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority, scheduling of processes at command, batch commands, kill, ps, who, sleep, Printing commands, grep, fgrep, find, sort, Cal, banner, touch, file, file related commands-ws, sat, cut, grep, dd, etc.

Mathematical commands- bc, expr, factor, units.

vi, joe, vim editor

### UNIT-III

Shell programming Basic of shell programming, Various types of shell, shell programming in bash, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, shell keywords, Creating Shell programs for automate system tasks and report printing, use of grep in shell, awk programming.

### UNIT-IV

System administration Common administrative tasks, identifying administrative files – configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing

groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, checking and monitoring system performance file security & Permissions, becoming super user using su.

Getting system information - host name, disk partitions & sizes, users, kernel.

Backup and restore files, linuxconf. utility in GUI, reconfiguration hardware with kudzu

Configure desktop-X configurator, understanding XF86config file, starting & using X desktop. KDE & Gnome graphical interfaces, changing X settings.

### UNIT-V

Basic networking administration Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to internet, administration in a networked environment, common networking administrative tasks, the network file system, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands a TCP/IP networks, DNS services, routing using Linux, SLIP & PPP services, UUCP.

Installation & Administration of mail server, ftp server and Apache web server.

### TEXTS & REFERENCES BOOKS :

- ❑ USING LINUX BY JACK TACKETT, DAVID GUNTER, PHI, EEE EDITION
- ❑ RED HAT LINUX 7.X BIBLE -CRISTOPHER NEGUS, IDG BOOKS INDIA LTD.
- ❑ LINUX INSTALLTION AND ADMINISTRATION, NICHOLAS WELLS, COURSE TECHNOLOGY (VIKAS PUBLISHING, NEW DELHI).
- ❑ UNIX - SUMITABA DAS
- ❑ UNIX SHELL PROGRAMMING - YASHWANT KANETKAR, BPB PUBLICATIONS,
- ❑ RED HAT LINUX UNLEASHED TECHMEDIA (BPB PUBLICATIONS)
- ❑ LINUX NETWORKING AND SECURITY - WELLS, COURSE TECHNOLOGY (VIKAS PUBLISHING, NEW DELHI).

**4MCA5(A)-THEORY OF COMPUTATION****UNIT-I**

Theory of Computation: Formal language, Need for formal computational models, Non-Computational problems, Diagonal argument and Russel's paradox

**UNIT-II**

Deterministic Finite Automaton (DFA), Non-deterministic Finite Automaton (NFA). Regular languages and regular sets, Equivalence of DFA and NFA, Minimizing the number of states of a DFA, Non-Regular languages

**UNIT-III**

Pushdown Automaton (PDA), Deterministic PushDown Automaton (DPDA), Non-equivalence of PDA & DPDA.

**UNIT-IV**

Context free grammars. Greibach Normal Form (GNF) and Chomsky Normal Form (CNF), Ambiguity, Parse tree representation of Derivations. Equivalence of PDA's and CFG's . Parsing techniques for parsing of general CFG's

**UNIT-V**

Turing machine( TM ): One tape, Multitape . The notions of time and space complexity in terms of TM. Construction of TM for simple problems. Computational complexity.

Chomsky Hierarchy of language : Recursive and Recursively – enumerable languages.

**TEXTS AND REFERENCE BOOKS:**

- ❑ INTRODUCTION TO AUTOMATION THEORY, LANGUAGES & COMPUTATION BY JOHN E HOPCROFT, RAJEEV MOTWANI, JEFFREY D. ULLMAN.
- ❑ THEORY OF COMPUTER SCIENCE (AUTOMATA, LANGUAGES AND COMPUTATION BY MISHRA & CHANDRASEKARAN (2<sup>ND</sup> EDITION ) PHI ISBN-81-203-1271-6
- ❑ ELEMENTS OF THE THEORY OF COMPUTATION BY LEWIS & PAPADIMITRIOU , PHI ISBN 81-203-1016-0

- ❑ INTRODUCTION TO LANGUAGES AND THEORY OF COMPUTATION BY JOHN C. MARTIN (2<sup>ND</sup> EDN) ISBN- 0-07-463722-3
- ❑ THEORY OF COMPUTATION BY BERNARD M. MORET PEARSON ISBN- 81-7808-550
- ❑ FUNDAMENTALS OF THEORY OF COMPUTATION BY RAYMOND GREENLAW & H. JAMES HOOVER (HARCOURT) ISBN : 81-7867-036-4
- ❑ ELEMENTS OF DISCRETE MATHS BY C.L.LIU TMH 2<sup>ND</sup> EDN ISBN-0-07-043476-X

## 4MCA5(B)-MICROPROCESSOR AND ASSEMBLY LANGUAGE PROGRAMMING

### UNIT-I

Microprocessor Architecture and its operation, Microprocessor initiated operation, Bus organisation of 8085, Registers, Memory unit of 8085, I/O device, Interfacing devices, Pin out Diagram of 8085

Bus timing, ALU of 8085 and its flags, Instruction set of 8085, Classification of Instructions.

### UNIT II

PROGRAMMING OF MICROPROCESSORS : Addressing Modes, Data transfer operation commands., Arithmetic operation commands, Logic operation commands, Branch operation commands, Writing and debugging simple assembly Language program, Tools for developing assembly Language program, Writing programs using an assembler, Branching looping and Indexing

### UNIT III

Stack, Subroutine, Conditional Call and return instructions., Advanced instructions –LHLD, SHLD, XCHG, PUSH, POP, XTHL, PCHL, Assembly Programs of addition, subtraction, multiplication and division of multi byte signed and unsigned numbers,.

8086 Pin Description, Operating modes, Registers of 8086, 8086 Bus Cycle, Addressing Modes of 8086

### UNIT-IV

INTERFACING THE I/O PERIPHERALS : Basic Interfacing concepts, Interfacing output display, Interfacing input key board,

### TEXTS AND REFERENCE BOOKS:

- ❑ MICROPROCESSORS AND INTERFACING BY D.V. HALL TMH, 2<sup>ND</sup> EDITION.
- ❑ IBM PC ASSEMBLY LANGUAGE PROGRAMMING BY PETER ABLE, PHI

## 4MCA5(C)-ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM

### UNIT-I

General issues and overview of AI, AI Techniques, AL problems, AI Techniques, importance and areas of AI, problem solving state space search-DLF, BFS Production system, problem characteristics.

Heuristic Search Techniques: Generate and Test, Hill Climbing, Best First Search, Problem reduction, Constraint satisfaction-Cryptarithmic and problems.

### UNIT-II

Knowledge representation & mapping, approaches to knowledge to representation, issues in knowledge representation, Representing simple facts in logic, representing instance and relationships, Resolution and natural deduction

Representing knowledge using rules, Procedural v/s Declarative knowledge, Logic programming, Forward v/s Backward chaining, Matching & control knowledge.

### UNIT-III

AI programming language: Prolog- objects, relationships, facts, rules and variables, Prolog: Syntax and data structures, representing objects & relationships by using “trees” and “lists”, use of cut, I/O of characters and structures.

Symbolic reasoning under uncertainty: Introduction to monotonic reasoning, Logics for Nonmonotonic reasoning, implementation issues, implementation: DFS & BFS.

### UNIT-IV

Slot and filler structures: Semantic nets, frames, conceptual dependency, scripts, CYC Natural languages and NLP, Syntactic processing parsing techniques, semantic analysis case grammar, augmented transition net, discourse & pragmatic processing, translation.

### UNIT-V

Definition and characteristics of Expert System, representing and using domain knowledge, Expert system shells



Knowledge Engineering, knowledge acquisition, expert system life cycle & expert system tools, CYCIN & DENDRAL examples of expert system

**TEXTS & REGERENCE BOOKS:**

- ❑ ARTIFICIAL INTELLIGENCE \_ RICH & KNIGHT
- ❑ PROGRAMMING IN PROLOG-CLOKSIN & MELLISH
- ❑ INTRODUCTION TO ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM
- ❑ PRINCIPLES OF ARTIFICIAL INTELLIGENCE - NILLSON
- ❑ FOUNDATION OF ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM \_ JANAKIRAMAN, SURUKESI & GOPAL KRISHNAN

**5MCA1- COMPONENT ARCHITECTURE AND PROGRAMMING (COM, DCOM)**

**UNIT-I**

**INTRODUCTION TO MICROSOFT'S OBJECT TECHNOLOGY**

Understanding OLE - OLE 1.0, OLE 2.0, OLE Controls, Structured Storage, Monikers, OLE Automation, An Overview of Active X- Active X Documents, Asynchronous Storage, Activex Controls, Internet Monikers.

New Active-X Technologies - Active-X Hyperlinks, Active-X Conferencing, Active-X Server Extension, Active-X Script, Distributed Com (DCOM)

**UNIT-II**

**BUILDING COM OBJECTS AND INTERFACES**

Introduction To Objects And Classes, Objects From A Com Perspective, Encapsulation In Com, Interfaces, Inheritance In Com, Method Overriding Polymorphism And Class Objects In Com.

Clients And Servers, Local Server, Remote Servers, Proxies, Remote Procedure Cell, Generating Gui Using Uuidgen & Guidgen Exploring Unknown, Implementing and Com Client afnd Server.

**UNIT-III**

**COM PROGRAMMING WITH MFC**

An Introduction To The MFC, MFC And OLE/Active-X, The Active-X Template Library, Multiple Interfaces And Inheritance. Multiple Interfaces By Using Nested Classes, Declaring Nested Classes, Declaring And Implementing Interface Maps, Implementing Iuknown For Nested Classes, Using Aggregation To Simulate Inheritance, Interface Definition Languages.UNIT – IV

DISTRIBUTED OBJECTS OVERVIEW : The Evolution of Distributed System, Client / Server - Two-Tier, Three-Tier, N-Tier.

Distributed Com- Object RPCS, The OXID, Passing Interface Painters, Optimizing DCOM, Caching OXID, Introduction to Com Security, DCOM and CAPI.



**UNIT-V****THE CORBA ARCHITECTURE**

Overview and History, The Object Request Broker, Interface Definition Language, The Corba Communication Model, The CORBA Object Model, CORBA Client and Servers, Stubs and Skeletons. Interface Definition Language (IDL) - IDL Ground Rules, Coupling and Cohesion, Primitive and Constructed Types, Container and Exception Type, The Any Type.

Building a CORBA Application, Building a CORBA Server, Building a CORBA Client.

**TEXT & REFERENCE BOOKS :**

- ❑ **COM/DCOM PRIMER PLUS:** BY CHRIS CARRY, VINCANT MAYFIELD  
TECHMEDIA PUBLICATION
- ❑ **TEACH YOURSELF CORBA IN 14 DAYS :** BY JEREMY ROSENBERGER  
TECHMEDIA PUBLICATION

**5MCA2-COMPUTER GRAPHICS****UNIT – I**

What is Graphics, Application of Graphics, Elements of Graphics Workstation, Graphics I/P Devices-KeyBoard, Trackball, Joystick, Light Pen, Digitizing Tables, Mouse, Touch Panels, Image Scanners . Graphics Display Devices-Raster Scan System, Random Scan System, Arch Of Vector and Raster Scan Display, Refresh CRT, Gray S Haden

**UNIT-II**

DRAWING GEOMETRY: Point – Plotting, Coordinate System, Point Plotting, Line Drawing –Line Segments, Line Drawing Algo : DDA Algo , Bresenham's Line Algorithm.Circle Drawing Polygon Representation Ellipse, Rectangle, Filling – Filled Area Primitives, Scan Line Polygon Fill Algo, Flood Fill Algo, Boundary Fill Algorithm.

**UNIT-III**

2D Geometric Transformation : Translation, Rotation, Scaling, Geometric Transformation, Coordinate Transform and Composite Transformation, 2D Viewing Transformation & Clipping : World Coordinate System (WCS), Normalized Device Coordinate System , Windows Viewing View Ports Viewing, Point Clipping, Line Segment Clipping, Cohen – Sutherland, Line Clipping , Polygon Clipping.

**UNIT-IV**

3D Geometric Transformation 3D Geometric Transformation : Translation, Rotation, Scaling, Coordinate Transform Geometric Transformation Composite Transformation, 3D Display Methods – Parallel Projection Perspective Projection 3D Viewing & Clipping .

**UNIT – IV**

Segment, Segment Table, Segment Creation, Deletion, Closing, Renaming, Curve Generation , B – Spline Curves, Bezier Curves, Hidden Surface, Z – Buffer Algorithm, Scan Line Algorithm, Painters Algorithm, Depth Comparisons.

**TEXT & REFERENCE BOOKS :**

- ❑ **COMPUTER GRAPHICS : A PROGRAMMING, APPROACH - STEVEN**  
HARRINGLOM (MGH)
- ❑ **COMPUTER GRAPHICS : SCHAUM'S OUTLINE SERIES**
- ❑ **COMPUTER GRAPHICS : DONALD HEAON & M. PAULIVE BAKER (PHI)**

**5MCA3 SOFTWARE ENGINEERING****UNIT - I**

**SOFTWARE :** Software Characteristics, Components & Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & Rad Model., Evolutionary Software Process Model – Incremental Model and Spiral Model.

**SOFTWARE PROJECT MANAGEMENT :** Project Management Concepts – People Problem and Process

**S/W PROCESS AND PROJECT METRICS :** Metrics in The Process and Project Domains . Software Measurement –Size Oriented, Function Oriented Metrics, Extended Function

**UNIT - II**

**SOFTWARE PROJECT PLANNING:** Objectives, Scope, Project Estimation, Decomposition Techniques, Empirical Estimation Models.

**ANALYSIS CONCEPT AND PRINCIPLES :** Requirement Analysis, Communication Techniques, Analysis Principles, Software Prototyping, Specifications.

**ANALYSIS MODELING:** Elements of The Analysis Modeling, Data Modeling . Functional Modeling and Information Flow, Behavioral Modeling, Data Dictionary.

**UNIT - III**

**DESIGN CONCEPTS AND PRINCIPLES:** Design Process, Design Concepts, Design Principles, Effective Modular Design .

**DESIGN METHODS :** Architectural Design Process, Transform Mapping and Transaction Mapping, Interface Design, - Internal and External Design, Human computer Interface Design, Interface Design Guidelines, Procedural Design,

**UNIT - IV**

**S/W Quality Assurance :** Quality Concepts, Matrix for Software Quality, Quality Movement, S/W Q A, S/W Review, Formal Technical

Reviews, Formal Approaches to Sqa, S/W Reliability, ISO 9000 quality Standards

**S/W TESTING MODELS :** S/W Testing Fundamentals, Test Case Design, White and Black Box Testing, Basic Path Testing, Control Structure

**S/W TESTING STRATEGIES :** Strategic Approach To S/W Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Debugging

**UNIT - V**

**S/W REUSE :** Reuse Process, Building Reuse Components, Classified And Retrieving Components, Economics Of S/W Reuse

**COMPUTER AIDED S/W ENGINEERING:** Introducing of Case, Building Block For Case, Taxonomy Of Case Tools, Integrating Case Environment, Integrating Architecture, Case Repository

**TEXTS & REFERENCE BOOKS :**

- ❑ **Software Engineering** By R.S.Pressman
- ❑ **An Integrated Approach To Software Engineering** By Pankaj Jalote

**5MCA4-PROGRAMMING IN VC++****UNIT- I**

Elements of GUI & Visual design, Designing and Creating a Visual C++ Program, Project work spaces, Debug and Release Targets, Cleaning up, various features of the Visual C++ IDE.

**UNITS – II & III**

Basics of Windows Architecture, Simple WIN 32 SDK executables,

**UNIT- IV**

Basics of MFC & MFC-based executables..

**UNIT-V****MESSAGES AND EVENTS**

Understanding Message maps and message loops, Events and Event handling, Mouse events, Keyboard events, Dynamic data Exchange and verification, creating Menus, Modeless dialog boxes.

**UNIT-VI****GRAPHICS**

Device contexts, working with images, bitmaps and icons, creating bitmap buttons, creating and using Pens, Brushes, and Fonts.

**UNIT-VII****DOCUMENTS AND VIEWS**

Document - View Architecture basics, the document class and view class, creating SDI applications, Multitasking, creating MDI Applications, Working with menu in documents, Toolbar and status bar.

**UNIT-VIII****HANDLING FILE AND DATA APPLICATIONS**

Printing and Print preview, Saving, loading and transferring data, Serialization, File handling, using Databases and Record views, Database access, The Visual C++ ODBC class.

**TEXTS & REFERENCE BOOKS :**

- ❑ CHARLES PETZOLD, *PROGRAMMING WINDOWS*, 5TH EDITION, MICROSOFT PRESS, 1999

- ❑ JEFF PROSISE, *PROGRAMMING WINDOWS WITH MFC*, MICROSOFT PRESS, 2000
- ❑ IVOR HORTON, *PROGRAMMING VISUAL C++ STANDARD EDITION*, WROX PRESS, 1999
- ❑ JON BATES AND TIM TOMPKINS, *PRACTICAL VISUAL C++ 6*, 2ND EDITION.
- ❑ CHUCK SPHAR, *LEARN VISUAL C++ NOW*, MICROSOFT PRESS/PHI, 1999
- ❑ DAVID KRUGLINSKI, GEORGE SHEPHERD & SCOT WINGO, *PROGRAMMING VISUAL C++*, MICROSOFT PRESS, INDIAN REPRINT, 2000
- ❑ MIKE BLASZCZAK, *PROFESSIONAL MFC WITH VISUAL C++*, WROX PRESS, 1999, INDIAN REPRINT, 2000, SHROFF PUBLISHERS AND DISTRIBUTORS

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## 5MCA5(A)-HARDWARE MAINTENANCE

### UNIT-1: INTRODUCTION TO HARDWARE

Basic Concepts of Hardware, 8088,286,386,P-I,P-II, P-III, P-IV, Microprocessors (Types & Its Speed), Internal Mpu Components & Functions Jumpers, Dip Switches, Cache (L1&L2), CPU, (BIF,ZIF,STOCK) CPU Fan, Keyboard (Membrane & Mechanical), Number System, Integrated Circuits, Digital Circuits, RAM .ROM,Cache Ram,Cards (Display, Ethernet Cards,Nic), Serial & Parallel Ports Smps (Connection to MB, Connection to Peripherals, Failure & Replacement) Printers (Overview,Types) & Connections.

### UNIT -II : PC COMPONENT & ARCHITECTURE

Pc System Architecture & Overview, Motherboard ( Slots,Sockets & Connectors,Types ) Bus Slots Study Of Bus Standards, I/O Connections & Installation, Micro Computer System, Semiconductor Memories,Post, Expansion Bus (I/O Addressing, Interrupts,Com & Lpt, Ports, Usb Ports, Dma, Rules of Device Installation ), Disk Adapter, or Connections, Internal Adapter, Multiport Adapters, IRQ, Base Addressing, RAM (SDRAM,DRAM), ROM, Eprom, Configuring Adapters Low-Level Testing, Connecting Cables, Adapters and Reassembling)

### UNIT-III : DEVICE CONFIGURATION, INSTALLATION & OS

Understanding Configuration Steps, Disk Operating System Setup, CMOS Setup, BIOS (Physical BIOS, Flash BIOS), BIOS Configuration Information, Award BIOS, AMI BIOS, BIOS Settings, Memory(Addressing,Parity & Configuration, EDO), Sockets & Banks,Changing BIOS The Memory Setting, Choosing The Right Memory, Adding & Replacing Memory Modules, Configuring The Motherboard, Booting Process,Booting Sequence, Boot Strap Loader Program, Booting From Floppy,Cd & Hdd, Creating Booting Floppy Maintenance, Dos User Interface.

### UNIT- IV: MASS STORAGE DEVICES.

Hard Disk Overview, HDD Capacity (MB, GB) Platter, Read/Write Heads, Choosing A Disk Type, SCSI, EIDE, Non-SCSI, SCSI Versus

IDE, Adding SCSI to An IDE System, Planning & Installation,Data Backups, Power Consideration, Drive Configuration, Installing A New Drive, Replacing An IDE Drive,Adding A New SCSI & EIDE Drive, Preparing & Formatting The Drive, Portioning Drive, Low Level & High Level Formatting Floppy Disk Drive (Type, 1.2 & 1.44, Features) Power Connectors Compatibility, Data Cable Connectivity, First Boot,Types of Drive, Parallel Port Tape Drives, IDE, SCSI Tape Drives, Installing Internal SCSI Tape Drive, Configuration & Drive Related Commands Maintenance & Troubleshooting.

### UNIT -V: PC ACCESSORIES & PERIPHERALS

Video Overview, Resolution & Color Depth, Video Card Standards (Monitor Components & Characteristics) Video Memory Technologies Video Drives, Refresh Rate, Graphics & Video Acceleration, Installing A Video Card,TV Tuner Card, Sound Card (Types Of Sound Cards,Installation,Drives, Jumper Setting, Connections), Speakers, Head Phones, Microphone, Midi, Connecting Devices to The Card,Configuration, CD ROM Drive (24X, 48X, 52X), Installing CD Rom & CD ROM Drive Specification & Configuration, CD Write(4X, 8X), Mouse, Types of Mouse, Modem (Uarts,Protocols,Flow Control, Compression, Standards, Connectors), Internal & External Modem, Voice & Fax Modem, Installation & Configuration, Modem Drive & Software's, Scanners(Flat Bed,Hand roller, Installation & Drives) Plug & Play. Plotters & Troubleshooting

### TEXT & REFERENCE BOOKS :

❑ UPGRADING PCS ILLUSTRATED-JIM BOYEE

**5MCA5(B)-MULTIMEDIA AND VIRTUAL REALITY****UNIT- I****MULTIMEDIA: AN INTRODUCTION, TEXT, IMAGES & ITS PROCESSING TOOLS**

Needs and Area to Use and Develop Multimedia Software ?  
 Multimedia Development Team and Skills, MAC V/S Windows Platform, Basic Tools for Development Multimedia Application  
 Multimedia Building Blocks, Making Simple Multimedia with Popular Applications. Stages of Multimedia Design : Planning, Content Analysis, Instructional Design, Preparation of Media Elements, Integration of Media Elements Authoring, Evolution ., Text-Plain Text and Formatted Text, Hyper Text, Text Markup Language (HTML), Conversion of Text Formats, Object Linking and Embedding Concept and Text Preparation Tools . Fonts Editing and Design Tools, Text Effects, Image –Types of Graphics-Vector and Raster, Attributes of Image-Resolution, Images, Pixel Depth, Color, Color Palates, Compression of Images and its Affects to Quality and Storage Size, Various Files Formats – BMP, DIB, EPS, CIF, PEX, PIC, TGA and TIF Formats The Windows Meta Files Formats, File Formats Conversion, Compression Techniques-REL Compression, LZW Compression, JPEG Fractal Compression and Wavelet Compression Processing Tools –Techniques of Capturing Image and Converting Image, Software Tools for Processing Images Techniques of Special Text Effects Using Various Software.

**UNIT – II****DIGITAL SOUND - ITS CAPTURING AND EDITING TOOLS**

Sound and its Attributes-Sound and its Effects in Multimedia, Sampling of Sound, Frequency, Sound Depth, Channels in Sound and Third Effects on Quality and Storage Size Estimation of Space of A Sound File, Sound Card Standard – Fm Synthesis Cards, Waves Table Cards, Midi and Mp3 Files and Devices, 3d Sounds, Capturing and Editing Sound Wave for Indo

**UNIT III COMPUTER ANIMATION - ITS TECHNIQUES AND DEVELOPMENT TOOLS**

Animation and its Basic – Principals of Animation and its Use in Multimedia Computer System Configuration and Peripherals

Requirements, Software for Animation, Effects of Resolution Pixel Depth Image Size on Quality and Storage Size Types of Animation, Step for Creating and Generic Animation

Animation Techniques – Concept of Key Frame, Tracing and Path, 2D Animation Techniques : Tweaking, Morphing, Color Cycling, Walk Cycle Wrap, Rotation, 3D Animation Techniques : Lofting, Lighting Revolving Inverse Kinematics Morphing Key Framing Various Tools for Creating Animation Like Animation Pro 3D Studio Paint Shop Pro Animation

**UNIT- IV:****DIGITAL VIDEO AND VIDEO MAKING TOOLS**

Basic of Video – Analog and Digital Video Type of Video Computer System Configuration and Peripherals Required Digitization of Analog Video Type of Video Problems Due to Interlacing or Non Interlacing, Video Standard – NTSC, Pal, Secma, HDTV, Video Capturing Media /Instruments Videodisk Camcorder Compression Techniques, File Formats AVI, MJPG, MPEG, Move Real Video, Video Editing and Movie Making Tools Quick Time Video for Window Adobe Premier

**UNIT –V:****MULTIMEDIA, AUTHORING AND VIRTUAL REALITY**

Selecting and Using and Authoring Tool Factor for Selecting And Authoring Tool Multimedia and Internet Tools Pro Web Multimedia Various Plug Ins for Web . HTML and Multimedia Designing Tips Text and Image Pro Web Planning and Distribution of A Multimedia Project, Virtual Reality Terminology Head Mounts Display (HMD), Boom, Cave, Input Devices and Sensual Technology, Characteristic If Immersive Vr Shared Virtual Environments, Non Immersive VR,VRML, VR - Related Technology Application

**TEXT & REFERENCE BOOKS :**

- ❑ **MULTIMEDIA MAKING IT WORK (4<sup>TH</sup> EDITION)-BY VAUGHAN TATA**  
MEGRAW HILL
- ❑ **MULTIMEDIA IN ACTION BY JAMES E SHUMAN, VIKAS PUBLISHING**
- ❑ **MULTIMEDIA ON THE PC BY - NORMAN DESMARASIS TATA MEGRAW HILL**
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**5MCA5(C)-DATA WAREHOUSING AND MINING****UNIT – I**

Data Warehousing Concept and Definition Operational Data, Common Characteristics of Data Warehouse, Knowledge Discovery and Decision Making, Knowledge Discovery and Data Mining, Application of Data Warehouse .

**UNIT – II**

Find User Data Access Tools – Data Warehouse Query Tools, Data Modeling Strategy - Star Schema, Multi Fact Table Star Schema, Star With The Original Entry Relationship Model, Dimensional Model, OLAP, Relational OLAP, Multidimensional Database, The Data Cube Presentation of Fact Tables

**UNIT – III**

Data Warehouse, Architecture and Optimization – 3 Tier Architecture, Oracle Warehouse, Components of An Oracle Data Warehouse, Classical Data Warehouse, Advantages of Using An Oracle Server, Transportaion of Data Into The Data Warehouse, Data Created in The Data Warehouse, Presentation of Data To End Users, Object Oriented System Architecture Definitions, Object Modeling Techniques,

**UNIT – IV**

Oracle Feature Suitable for Data Warehousing, Application Planning The Infrastructure – Oracle Server Configuration, Infrastructure Suitable for The Data Warehouse Using Oracle of A Guidelines, Data Warehouse Capacity Planning .

**UNIT – V**

Implementing of The Application Design, Necessity of data Warehouse Metadata, Performance optimization, Data administration techniques.

**TEXTS & REFERENCE BOOKS :**

- ❑ DATA WAREHOUSING WITH ORACLE BY SIMA YAZDANI – SHIRLEY S. WONG

**5MCA5(D)-PRINCIPLES OF COMPILER DESIGNING****UNIT – I**

Automata Introduction to Finite Automata, Structure Representation, Automata and Complexity, Alphabets, String, Language Informal Picture of Finite Automata, Deterministic Finite Automata, Nondeterministic Finite Automata, An Application .

**UNIT – II**

Introduction To Compiler, Overview of Compilation, Process , Typical Compiler Structure, Implementing A Compiler . Programming Language Grammars, Elements of A Formal Language Grammar, Derivation, Reduction & Syntax Trees, Ambiguity Regular Grammar & Regular Expression – Context Free Grammar.

**UNIT – III**

Scanning & Parsing Techniques – The Scanner, Regular Grammar and Fsa, Top Down Parsing, Parsing Algorithm, Top Down Parsing Without Backtracking, Predictive Parsers, Bottom Up Parsing, Parsing, Lr Parsers, Shift Reduce Parsing .

**UNIT – IV**

Symbol Table Organization, Memory Allocation – Static & Dynamic Memory Allocation, Compilation Control Transfer, Procedure Calls, Conditional Execution, Iteration Control Construct.

**UNIT – V**

Lexical Syntax Errors, Semantic, Major Issues In Optimization, Optimizing , Transformations, Local Optimization, Program Flow Analysis, Global Optimization.

**TEXTS & REFERENCE BOOKS :**

- ❑ INTRODUCTION TO AUTOMATA THEORY, LANGUAGE AND COMUTATION - “ JOHN E - HOPCOFT, RAJEEV MOTWANI, JEFFERY D. ULLMAN 2<sup>ND</sup> EDITION
- ❑ COMPILER CONSTRUCTION PRINCIPLES & PRACTICE – “ D.M. DHAMDHARE 2<sup>ND</sup> EDITION
- ❑ PRINCIPLES OF COMPILER DESIGN – AFFRED V. AHO, JEFFERY D. ULLMANCOMPILERS PRINCIPLES, TECHNIQUES AND TOOLS – AFFRED V. AHO RAVI SETHI, JEFFERY D. ULLMAN.