# Computer Organization:

## Unit I:

Number System: Binary, Octal, Hexadecimal and Computer Arithmetic with them. Addition and Subtraction for sign machine and 2's complement numbers. Floating-point representation and arithmetic. Computer codes binary, ASCII, EBCIDC, Redundant and error correcting codes.

Introduction to the computer as a purposeful collection of inter-linked elements CPU, Memory and I/O units.

## Unit II:

Structure and function of CPU as a collection of Registers, Arithmetic Logic and Control Unit. Concept of Storage, fetch and execution of instructions via data control and address buses. Types of main and auxiliary memory. RAM, ROM, PROM, DISK and TAPE memories. Static and Dynamic RAM.

## Unit III:

Logic Design of Computer, Truth Table, Boolean Algebra, AND, OR, NAND, NOR gates, Multiplexes, Flip-Flops shift registers and counters, decoders, encoders, design of combinational circuits, Speed mismatch between CPU and peripherals.

## Unit IV:

Flow of information among CPU, Memory and peripherals. Handling of interrupt, Programmed and DMA transfer of data, I/O buffers, handshaking, Design of I/O channels, Virtual memory, Time Sharing, Multiprogramming systems.

**Reference:**

Computer System Architecture By Moriss Mano

# Paper II

## Programming Through C & Data Structures:

**Unit I:**

Overview of programming: Introduction to computer based problems solving, Program design and implementation issues, Programming environment.

**Unit II:**

Fundamental of C Programming: Overview of C, Data Types, Operators, Expression, Control Constructs, Arrays, Basic I/O, Program Design examples, Advanced features.

**Unit III:**

Advanced Programming Techniques: Control Constructs, Functions and Recursion.

**Unit IV:**

Introduction to Pointers, Structures, Union, File Handling: File Pointers, File Accessing functions, Slandered C Header and Library Files, Command Line Argument, Creating Project Files.

**Unit V:**

Basic Concepts of data representation, Introduction to algorithm design and data structure, representation of arrays, single & multidimensional arrays, its storage. Stacks and Queues: Representation of stacks and queues, circular queues, application of stacks, introduction to postfix, priority queues. Link List : Singly linked list, operation on the list circular list, Double linked list, Simulation using linked lists, garbage collection.

Reference:

Programming in C by Raja Raman.

Data Structures Using C and C++ by Tenanbaum or Schaums Series.

# Paper III

## Pc Software Skills:

### Unit I:

History of Computer and generation of computers, Classification, Hardware, Software, Representation of Information, Types of Software: System and Application Software.

### Unit II:

Windows: Windows Basic, Explorer, Internet Explorer, File Management, Device Management, OLE Concepts.

### Unit III:

Word Processor: Basics of Word Processing, Document enhancement, Graphics using templates and wizards.

Spread Sheet: Worksheets basics, Formatting and Calculation, Functions and macros, Working with graphs and charts, Multiple worksheets.

Presentation Tools: (M.S.-Power Point): Presentation of slides, Movement of slides etc.

### Unit IV:

Internet Fundamentals: Surfing and usage of Internet, Email, FTP, TELNET, WWW, etc.

### Unit V:

Hypertext Mark Up Language and Dynamic Hypertext Mark Up Language HTML/DHTML & Designing Tools.

Reference:

Microsoft Office : Reference Book Published By TMH

HTML: Reference Book Published By BPB

# Paper IV

## System Analysis & Design:

### Unit I:

Introduction to system definition and concepts: Real Life business sub system, System Environment and boundaries, Role and need of System Analyst, Introduction of SDLC (System Development Life Cycle).

### Unit II:

System Planning: Data and fact gathering techniques, Feasibility studies, Feasibility reports, System selection plan and proposal, Cost benefit and analysis, System Design and modeling, Data Flow Diagram, I/O from Design, Modular and system design.

### Unit III:

System Implementation and maintenance: Planning consideration, System evaluation and performance, maintenance activities, System Audit and Security.

### Unit IV:

Introduction to MIS, Definition of MIS, System approach to MIS, MIS organization with in a company, Conceptual design of MIS, System Objectives and System Constraints, Alternative System Design and Selection.

### Unit V:

Detailed System Design and Implementation: Basic System Design concept to MIS, Role of MIS development and System Analyst.

Reference:

System Analysis & Design By Awad.

**E-commerce:**

E-Commerce: An Introduction to E-Commerce and Internet. Portal Site Development, Multimedia , 3D, Virtual reality (VRML) , E-Commerce – Business to Business to Consumer, Setting up of an E-Business, Net for trading, advertising and marketing., Secure Transaction on Net, Various Protocol used on the Internet to secure the transaction, SET, SSL, Electronic Fund Transfer, E-Banking, Shopping Mall, Mail Service, Content Service, Web Advertisement. Content Development & Deployment: News , Free Email, Chat Rooms, Search Engines, Viruses, Worm, Authentication, Protection and Access Control, Introduction to 'Tally' software.

Reference:

E-Commerce By Kamlesh Bajaj and Nag Published By TMH

## Paper I

## Introduction to Database Management System:

### Unit I:

Overview of Database Management System, File Oriented Approach Vs Data oriented approach, Database System, Structure of Database System, Data Independence, Primary and Secondary Objectives of Database System, Role of DBA.

### Unit II:

Entity, Attributes, Tuples, E-R Diagrams, Relationships, Schema, Sub-Schema, View of Data and DBMS, Components and function of DBMS

### Unit III:

Database Models : Hierarchical Model, Network Model, Relational Model, Operations on RDBMS, Examples of Different Models.

### Unit IV:

Functional Dependence, Transitive Dependence, 1NF, 2NF, 3NF, BCNF.

### Unit V:

SQL (DDL,DML) Object Oriented DBMS, Protection and Security Mechanism, Backup and Error Recovery.

Reference:

Introduction to Data Base Management System By Bipin Desai.

Data Base Design By C.J.Date

# Paper II

## Data Communication And Network:

### Unit I:

Introduction to Data Communication, Line Configuration, Topologies, Transmission Modes, Digital Signals, Encoding, Multiplexing

Network Hardware : Repeaters, Bridges, Routers, Gateways, Network Software, Design Issue, Interface and Services.

### Unit II:

Reference Models(OSI/ISO functions of layers), TCP/IP model, Layered Architecture, Transmission Media, Wireless Transmission.

### Unit III:

Ethernet, Access Method : CSMA/CD, Addressing, Frame Format, Token Bus, Token Ring: Access Method, Token Passing, Addressing Frames Format, X . 25, Frame Relay, ATM, ISDN Services: History, Subscriber Access To ISDN, Broad Band ISDN.

### Unit IV:

Routing Algorithms: Shortest Path, Flooding, Flow Based, Broadcast, Distinct Vector, Link State, General Principles of Congestion Control in Virtual Circuit in Datagram Sub Net, Chock Packets, Loads Shedding, TCP/IP, IP Addressing, Sub Nets.

### Unit V:

Application Layer, Network Security, Cryptography, Secret Key Algorithm, DNS, Email, Usenet, WWW, FTP,HTTP,TELNET.

Reference:

Data Communication and Network by Tenanbaum

# Paper III

## Object Oriented Programming Systems:

**Unit I:**

Overview of Object Oriented Concepts, Introduction: Need of Object Oriented Programming, Object Oriented Approach, Advantages of OOPS, Characteristics of OOPL Objects, Inheritance, Reusability, New Data Types, Polymorphism Overloading.

**Unit II:**

An Overview of C++ Programming: C++ objects, C++ objects as data types, constructor & Destructors, Object as arguments, Overloaded constructors, member functions outside the class, objects as argument, Returning object from functions, Structure and classes, static class data. An introduction to Array, Array as a class member data, Arrays as object, strings, Arrays of string. Strings as class members, User defined strings.

**Unit III:**

Operator Overloading: Overloading unary operators, Overloading binary operator, Arithmetic operator, Concertinaing strings, Multiple Overloading, Comparison Operator, Arithmetic assignment Operator, Data Conversion: Conversion between (Basic Types, Object and Basic Types, Between Object of Different Classes).

**Unit IV:**

Inheritance: Concept of base class and derived class, accessing the base class members, derived class constructors, overriding member functions, Virtual functions, Abstract base class, Public and Private Inheritance, Template Function and Template Class.

Pointers: Pointers and Arrays, Pointers and Strings, Pointers and Functions, Memory management ,New and Delete Operators, Pointer to objects, Pointers to Pointer, Linker-List Manipulation.

**Unit V:**

Files and Strings: Stream Class Hierarchy, String I/O, Character I/O, Object I/O, I/O with multiple objects, File Pointers (tellg). Disk I/O with member functions, Error Handling, I/O redirection IOS flags, Cerr and Clog Objects, Overloading of insertion and extraction operator, Command line arguments.

Reference:

C++ Programming by Robert Lafore

Programming in C++ by Bala Guruswamay

# Paper IV

**Visual Programming:**

**Visual Objects and Application Design:**

**Object Types:** Buttons, Text Boxes, Windows, Frames etc.

**Object Structure:** Attributes Methods etc. Creating Objects: Placing Objects to interact using programming or scripting.

**Design Strategies:** Enabling objects to interact using programming or scripting.

**Visual Development Environment:**

**Identification of features:** Use of advanced features to satisfy the requirements of an application features available will vary greatly between different development environments, but typical example might be the use of drag and drop, simple animation, linking to databases, Internet development.

Reference:
Using Visual Basic 6.0 by Resleman
Visual Basic 6.0 by Paul Sheriff

# Paper V

## Operating Systems:

### Unit I:

Needs and Functions of an Operating System, Evolution of an Operating System, Different views of an O.S., Types of O.S. O.S. Structure (Monolithic, Layered, Virtual Machines, Client Server)

Process: The process concept, O.S. view of processes, O.S. Services for process management, Scheduling algorithms and their performances evolution (Round Robin, FIFO, Priority, Shortest Job First, Two Level Scheduling, Multiple Queue.

### Unit II:

Memory Management: Contiguous management, Partitioned memory management (Static & Dynamic) Swapping, Memory Management with Bit Map Table, Linked List Allocation, Paging, Concept of Virtual Memory, Page replacement algorithms (FIFO, NRU,LRU,) Associative Memory.

### Unit III:

File System: Command Language User View of File System, Disk Controller and Disk Driver, OS view of file management, Disk Space Management, Shared Files, File System Reliability, File System Security.

### Unit IV:

Dead Lock Problem: Conditions for dead lock, Dealing with dead lock (detection & recovery, avoidance, prevention) Banker's Algo for single resources and for multiple resources. Windows Operating System.

### Unit V:

Case Studies: UNIX & DOS, Overview of UNIX, UNIX Shell, utility programs, files and directories, overview of DOS, MS-DOS Shell, MS-DOS-Memory Model, File-System, Processes, I/O Devices.

Reference:

Introduction to Operating System by Tananbaum.