FUNDAMENTALS OF COMPUTER AND INFORMATION TECHNOLOGY

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Unit 2 COMPUTER ORGANIZATION AND DATA PROCESSING

Introduction, Block–Diagram of computer, Advantages and Limitation of Computers, Characteristics of Computer, Applications of Computer, Programming Languages, Computer Data Processing

Unit 3 THE NUMBER SYSTEMS

Introduction, Decimal Number System, Binary Number System, Octal Number System, Hexa–Decimal Number System

Unit 4 BINARY ARITHMETICS

Introduction, Representation of Data, Representation of Alphabets, Representation of Numeric Data, Addition of Binary Numbers, Subtraction of Binary Data

BLOCK 2 : MEMORY AND IO DEVICES

Unit 5 MEMORY ORGANISATION : I

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Unit 6 MEMORY ORGANISATION : II

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Unit 8 OUTPUT DEVICES

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Unit 10 THE INTERNET

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Unit 11 DIGITAL SECURITIES

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Unit 13 APPLICATION SOFTWARES

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OPERATING SYSTEM AND SOFTWARE INSTALLATION

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Unit 2 Structure and Services of Operating System

Introduction, Structure of Operating System, Monolithic OS Structure, Layered OS Structure, Virtual Machines, Exokernels, Client–Server Model, Microkernel, Services of Operating System, User Interface, System and Utility Function Calls, Process Control, File Management, Communication Management, Information Maintenance, Device Management, Program Execution, Input/Output Operations, File Management, Error Detection, Communication, Resource Allocation, Accounting, System Protection, Objectives of Operating System, System View as Resource Manager, Users View as Virtual Machine, Ability to Evolve as Software

Unit 3 Windows Operating System

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BLOCK 2 : PROCESS MANAGEMENT

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Unit 5 Threads and Concurrency

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Unit 6 Process Scheduling

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Unit 7 Process Synchronization and Deadlocks

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BLOCK 3 : PROCESS MANAGEMENT

Unit 8 Memory Management

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Unit 9 Page Replacement Algorithms

Introduction, The Optimal Page Replacement Algorithm (PRA), The Not Recently Used (NRU) PRA, First In, First Out (FIFO) PRA, Second Chance PRA, Clock PRA, Last In, First Out (LIFO) PRA, Least Recently Used (LRU) PRA, The Aging PRA

Unit 10 Device Management

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Unit 11 File Systems

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Unit 12 Directories and File System Hierarchy

Introduction, File Organization, Directory Organization, File System Hierarchy

Unit 13 File System Implementation

Introduction, File System Layout, File Storage Allocation Methods, Directory Implementation, File Sharing, Disk Space Management, File System Reliability, File System Consistency, File System Performance

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BLOCK 4 : PROTECTION, SECURITY AND SOFTWARE INSTALLATION

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Unit 15 Protection

Introduction, Design Principles of an Operating System, Cryptography, User Authentication, Access Control

Unit 16 Operating System and Application Software Installation

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Unit 4 INPUT-OUTPUT OPERATORS

Introduction, Managing Input-Output operations, Formatted Input, Formatted Output

BLOCK 2 : DECISION MAKING AND LOOPING

Unit 5 DECISIONMAKING AND BRANCHING

Introduction, Decision making with If Statement, The Switch Statement, The ?: Operator, The goto Statement

Unit 6 LOOPING

Introduction, Decision Making and Looping, Jumps in Loops

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Unit 10 HANDLING STRINGS

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Unit 11 FUNCTIONS

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BLOCK 4 : STRUCTURES, POINTERS AND FILE HANDLING

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Unit 14 POINTERS

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Unit 2 **Topologies**

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Unit 3 **Extranet**

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Unit 4 **Web Essentials**

Introduction to IP Address, What is A URL ?, What Are Domains ?, Home Page & History, Web Space, Web Space Functions, Web Space Measurement, ISP Internet Service Providers

BLOCK 2 : NETWORK CONNECTION & APPLICATION OF INTERNET

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Unit 2 **Application of Internet – I**

Introduction, WWW (World Wide Web), Search Engine, Spider/ Crawler, Top 10 Search Engines, Web Servers, Introduction to JSP, News Group, Big 8 News Group

Unit 3 Application of Internet II

Introduction, Web Portal, Today's Portal, What a Portal Does, What are The Major Functions of Portals ?, A Portal Should, Personalization, Types of Personalization, Architecture of The Portal, Types of Portals, Vortal, Blogs, Micro Blogging, Remote Login

Unit 4 Computer Name and Workgroup

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BLOCK 3 : INTERNET TECHNOLOGY AND APPLICATION

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Unit 2 Recent Internet Technology Applications

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Unit 3 Internet Protocols

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Unit 4 Advance Protocol and Web Programming

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Unit 2 **Practical Use in HTML**

Introduction, Text Formatting, Links and Anchors, Meta Tag, Sound and Video, Images

Unit 3 **Structuring Web Pages**

Introduction, Tables, Table Heading, Cell Padding and Cell Spacing Attributes, Colspan and Rowspan Attributes, Tables Backgrounds, Table Height and Width, Table Caption, Nested Tables, Forms, Frames

Unit 4 **Concept of Website**

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Unit 3: General English

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ParagraphWriting, Comprehension

BLOCK 2: BUSINESS LETTER WRITING AND DIALOGUE FORMATION

Unit 1: Basics of Letter Writing

Physical Appearance, Structure, Design of Letter and Essential parts of Letter, Principles of Effective Letter Writing

Unit 2: How to Write Business Letters

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Unit 3: Types of Business Letters

Sample Letters, Inquiry Letters, Reply Letters, Order Letters, Letters for Execution of Orders, Complaint Letters, Reply and Adjustment Letters, Sales Letters, Reminder Letters

Unit 4: Dialogue Writing

Sample Dialogues, Dialogue between a student and a teacher, Dialogue between a father and a son/daughter, Dialogue between two friends, Dialogue between siblings, Dialogue between a customer and a shopkeeper, Dialogue between a husband and his wife.

BLOCK 3: LETTER WRITING AND INTER-DEPARTMENTAL COMMUNICATION

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Unit 2: Knowing other letters - 2

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Unit 3: Letter Writing

Personal Letter, Interview Letter, Appointment Letter, Calling for WrittenTest, Order of Appointment Letter, Show-Cause Notice, Charge Sheet, Letter of Dismissal, Discharge and otherFunctions, Secretarial Correspondence with Shareholders and Debenture Holders

Unit 4: Inter Departmental Communication

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Unit 2: Essay Writing

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Unit 2 ARRAY

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Unit 3 REPRESENTATIONS OF ARRAYS IN MEMORY

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Unit 5 MORE ON Link–List

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Unit 6 STACK AND THEIR APPLICATIONS

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Unit 7 QUEUES AND THEIR APPLICATIONS

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BLOCK 3 : TREE AND GRAPHS

Unit 8 TREES

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Unit 9 OPERATIONS ON BINARY TREE

Introduction, Operations on Binary Search Tree, Binary Tree Traversals, Inorder Traversal, Preorder Traversal, Postorder Traversal, Recursive Algorithms for Inorder, Preorder and Postorder

Unit 10 GRAPHS

Introduction, Definition, Terminology, Types and Representation of a Graph, Graph Traversal, Breadth First Search (BFS), Depth First Search (DFS), Shortest Path Algorithm, Kruskal's Algorithm, Prim's Algorithm

BLOCK 4 : TECHNIQUES (SEARCHING AND SORTING) AND FILE STRUCTURE

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Implementation of Linear Search, Implementation of Binary Search

Unit 12 SORTING TECHNIQUES

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Unit 13 FILE STRUCTURE

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BLOCK 2 : RELATIONAL DATABASE AND DATABASE DESIGN

Unit 4 INTRODUCTION TO RELATIONAL DATABASE

Introduction, Codd's 12 Rules, Terms, Keys, Anomalies of Un–normalized Database, Comparison Hierarchical, Network and Relational Databases

Unit 5 DATABASE DESIGN

Introduction, Database Development Life Cycle, Logical Design, Physical Model, Capacity Planning, Advantages and Disadvantages of Normalization

Unit 6 NORMALISATION

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BLOCK 3 : SQL AND OODBMS

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Unit 8 SQL CONSTRAINTS

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Unit 9 TRANSACTION PROCESSING

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Unit 10 OBJECT ORIENTED DATABASE MANAGEMENT SYSTEM

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Unit 12 DATA WAREHOUSING AND DATA MINING

Introduction, Concept, Architecture, Various Tools in Data Warehousing, Tools in Data Mining, Difference Between Data Mining and Normal Query

Unit 13 DATABASE SECURITY

Introduction, Password Authentication, Operating System Authentication, Why Protect Passwords ?, Control, Protection, Integrity, Privileged Accounts, SYS, SYSTEM, Other Issues, Operating System Group : DBA, Object Security, Access Rights, Resolving Object Synonyms, System Security, Defined System Privileges, Object Security Model, Database Auditing, Recovery from Various Problems of Volatile and Non–Volatile Storage Devices

Unit 14 RECOVERY MECHANISMS

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Introduction, Boolean Laws and Theorems of Boolean Algebra, Boolean Identities, Boolean Algebraic Properties

Unit 6 SIMPLIFICATION OF BOOLEAN ALGEBRA – I

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Unit 7 SIMPLIFICATION OF BOOLEAN ALGEBRA – II

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BLOCK 3 : DIGITAL COMPONENT

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Unit 9 DIGITAL COMPONENT

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Unit 12 INPUT/OUTPUT INTERFACE and DATA TRANSFER

Introduction, Input/Output Interface, Asynchronous Data Transfer and Mode of Data Transfer, Concept of Programmed I/O, DMA

Unit 13 MEMORY

Introduction, Memory Hierarchy, Primary Memory, RAM and Types of RAM, ROM and Types of ROM, Secondary Memory, Magnetic Disk, Magnetic Tape, Optical Memory (CDROM), Concept of Virtual Memory, Concept of Cache and Their Need

Unit 14 FLIP–FLOPS

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Unit 15 CPU

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Unit 2 PROGRAMMING CONCEPTS OF BASIC JAVA

Introduction, Tokens, Data Types in Java, Declaring a Variable, Java Coding Conventions, Typecasting, Constants

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Introduction, Arithmetic Operator, Increment / Decrement Operator, Assignment Operator, Bitwise Operator, Relation Operator, Logical Operator, Ternary Operator, Operator Precedence

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BLOCK 2 : OBJECT, CLASSES AND FEATURES

Unit 5 OBJECTS AND CLASSES

Introduction, The General Form of a Class, Argument Passing, Constructors, The This Keyword, The Finalize ( ) Method

Unit 6 LANGUAGE FEATURES

Introduction, Static Keyword, Using Abstract Classes, Interfaces, Packages, Access Protection

Unit 7 WRAPPER CLASSES

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Unit 8 JAVA COLLECTION FRAMEWORK

Introduction, Collection Interface, List Interface, LinkedList Class, ArrayList Class, Stack Class, Queue Interface, Set Interface, TreeSet Class, Hashset Class, Map Interface, TreeMap Class, HashMap Class, Iterator

BLOCK 3 : INHERITANCE, EXCEPTION HANDLING AND MULTITHREADING

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Unit 10 EXCEPTION HANDLING

Introduction, Types of Exceptions, Uncaught Exception, Using Try and Catch Block, Using Multiple Catch Statements, Using Methods Defined by Exception and Throwable, User Defined Exceptions, Using Throws/ Throw Keyword, Using Finally Keyword, Nested Try Statements

Unit 11 UTILITIES & MULTITHREADING

Introduction, Comparing Arrays : Java Util, Creating a Hash Table : Java Util, Multithreading, Thread Life Cycle, The Thread Class and The Runnable Interface, Thread Priorities, Synchronisation, Deadlock, Suspending, Resuming and Stopping Threads

BLOCK 4 : ABSTRACT WINDOW TOOLKIT AND WORKING WITH FILES

Unit 12 APPLET

Introduction, Difference between Applet and Application, Applet Life Cycle, Creating an Applet, Applet Tag, Reading Parameters into Applet, Implementation of Background Colour, Implementation of Font in Applet

Unit 13 APPLET GRAPHICS

Introduction, Drawing Line, Drawing Oval, Drawing Circle, Drawing Rectangle, Drawing Arcs, Drawing Polygons, Drawing Polyline, Delegation Event Model

Unit 14 ABSTRACT WINDOW TOOLKIT

Introduction, Window Fundamentals, Working with Graphics, Controls, Understanding Layout Managers, Adapter Classes, Inner Classes, Anonymous Inner Classes

Unit 15 WORKING WITH FILES

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SYSTEM ANALYSIS AND DESIGN

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BLOCK 1 : SYSTEM DEVELOPMENT LIFECYCLE AND MODELLING

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Unit 2 SYSTEM AND WORKING WITH TECHNOLOGY

Introduction, System, Computer Based Business System, Personal Traits of a System Analyst, System Life Cycle, Working with Technology

Unit 3 MODELLING TOOLS FOR SYSTEM ANALYST

Introduction, Role of Data in Business, Modelling with DFD, DFD'S with CASE, Structured Methodology

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Unit 4 SYSTEM DEVELOPMENT LIFE CYCLE

Introduction, Stages of System Development Life Cycle, Project Selection, Feasibility Study, Analysis, Design, Implementation, Post – Implementation and Maintenance, Considerations for Candidate System, Planning and Control for System Success

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Introduction, Fact Finding and Interview, Detailed Analysis, Review and Assignment, Working with People with Technology

Unit 6 SYSTEM REQUIREMENT SPECIFICATIONS & ANALYSIS

Introduction, What is Requirements Determination ?, Fact – Finding Techniques, What is Structured Analysis ?, Pros and Cons of Each Tool

Unit 7 PROTOTYPING AND 4GLS

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BLOCK 3 : FILE DESIGNING AND TESTING

Unit 8 FILE DESIGN

Introduction, File Design, Database Design, Overview of Implementation, Scheduling and Assigning Tasks

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Introduction, Training, Training Systems Operators, User Training, Training methods, Vendor and In–Service Training, In–house Training, Conversion, Conversion Methods, Conversion Plan, Operating Plan

Unit 11 SYSTEM SECURITY, AUDIT AND QUALITY ASSURANCE

Introduction, System Audit, Quality Assurance in SDLC, Specifications for Quality Factors, Software Requirement Specification, Software Design Specification, Software Testing and Its Implementation, Software Support and Maintenance

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Unit 13 DATA ORIENTED SYSTEMS DESIGN

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Unit 14 OBJECT ORIENTED ANALYSIS AND DESIGN

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Introduction, Programming Languages, 8085 Assembly Language

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Introduction, Functions of Assembler, Architecture of Assembler

Unit 4 THE MACRO PROCESSOR AND LOADERS

Introduction, Macro Instructions, Macro Processor, Loaders

BLOCK 2 : INTRODUCTION TO MICROPROCESSOR

Unit 5 INTRODUCTION TO MICROPROCESSOR

Introduction, Microprocessors, Internal Architecture, Bus System Architecture

Unit 6 HISTORY AND OVERVIEW OF MICROPROCESSORS

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