

**DIPLOMA (COMPUTER SCIENCE) – SECTION B**

Group A +							
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**Subject Name:** English-II

- Functional Grammar:** Articles, Preposition, Tenses: Functions, Synthesis, Transformation, Spotting errors and correction of sentences.
- Pre- Requisites of Technical written Communication:** One word substitution, Spelling rules, Words often confused & misused, Phrases.
- The Structure of sentences/ clauses:** Adverb clause, Adjective clause, Noun clause. Sentences: Simple, Double, Multiple and complex, Transformation of sentences: simple to complex & vice versa, simple to compound & vice-versa, Interrogative to assertive & to negative & vice-versa.
- Technical Communication:** Nature, Origin and Development, Salient features, Scope & Significance, Forms of Technical Communication, Difference between Technical Communication & General writing, Objective Style vs. Literary Composition.

**Subject Name:** Applied Mathematics-II

- Complex Numbers:** Complex Numbers, phasor and Application of Complex Number in R.L.C. Circuits.
- Differential Calculus:** Functions and Limits, Differentiation, Approximation of Errors by Differentials.
- Integral Calculus:** Indefinite Integral, Definite Integrals, Area Bounded by a Curve and Axes, Average Value and Root Mean Square Value of a function, Finite Differences and Numerical.
- Partial Differentiation:** Partial Differentiation.
- Solution of Ordinary Differential Equations:** Differential Equations, Linear Differential Equations, Applications of Differential Equations to R-L-C Electric Circuits.

**Subject Name:** Introduction to Programming & C

**Unit-I**

- Introduction to computer system:** Introduction, Characteristics of computer, Drawbacks of computers, Generations of Computers
- Computer Organization:** Architecture of Computer System

3. **Number System:** Introduction, Commonly Used Number System, Decimal, Binary, Octal, Hexadecimal, Converting from one number system to another
4. **Binary Arithmetic:** Introduction, Binary Addition, Subtraction, Multiplication, Division, Representations of characters, BCD Code, EBCDIC, ASCII, Fixed Point Representation, Floating Point Representation
5. **Algorithms and Flowchart:** Algorithms, Characteristics of algorithms, Flowchart, Different Symbols used in Flowcharts.
6. **Computer Languages:** Machine Language, Advantages of Machine Language, Disadvantages of Machine Language, High Level Language, Assembly Language, Software, Type of Software, System Software, Application Software
7. **Input-output Devices:** Introduction, Offline Input Devices, Online Input Devices, Punched Cards, Keyboards, Mouse, Touch Pad, Light Pen, Scanner
8. **Storage Devices:** Introduction, Primary Memory, RAM, DRAM, ROM, PROM, EPROM, Cache Memory, Secondary Memory, Magnetic Tape, floppy, Hard Disk, CD-ROM
9. **Operating System:** Introduction, Type of Operating System, Batch Processing Operating System, Single-user Operating System, Multi-User Operating System, Multi-Processing Operating System, Real Time Operating System, DOS, Functions of DOS
10. **Viruses:** Introduction, Types of Viruses, Antivirus

## Unit-II

1. **An introduction to C:** History of C, Feature of C, Structure of a C program, Variables and Data Types, Arithmetic Expressions
2. **Components of C Language:** Character Set, C token, Data Type in C, Operators, Type Casting, Data Conversion
3. **Input / Output Functions:** Formatted Input / Output functions, The print function, The scanf Function, Unformatted Input / Output Function, Character Input / Output Function, String Input / Output Functions
4. **Conditional Statement:** Introduction, If-else statement, Nesting If-else Statement, The switch Statement
5. **Looping:** Introduction, While Loop, Do While Loop, Nesting Loop, The Break Statement, The Continious Statement
6. **Arrays in C:** Array, Two Dimensional Arrays, Passing Array as Parameters, String, Some Library Function for String Handling
7. **Function:** Modular Programming, Top-Down Approach, Structured Programming, function with no Argument and no Return Value, Function Prototype, Storage class in C, Declaring Variables of Specified Storage Classes, Local and Global Variables.
8. **Pointer in C:** Pointer, Passing Pointers as Parameters, Dynamic Memory Allocation, Pointer to Pointer, Pointer to Function.
9. **Structure and Union:** Structure, Array of Structure, Pointer to Structure, Nested Structure, Structure and Function, Difference between Structure and Union.
10. **File Handling in C:** Introduction, Difference between Text and Binary File, Basic File Handling Functions, File Input / Output.
11. **Preprocessor:** Introduction, Functions of a C Preprocessor.

**Subject Name:** System Analysis and Design

## Unit-I

1. **System Definition and Concepts:** General Theory systems, Manual and automated systems, Real- life business Sub - Systems. System environment and boundaries. Real - time and distributed systems. Basic principles of successful systems. Approach to system development: Structure system analysis and design, Prototype, Joint application development.

2. **System Analyst:** Role and need of system analyst. Qualifications and responsibilities. System analysis as a profession.
3. **System Development Cycle:** Introduction to Systems Development Life cycle (SDLS). Various phases of SDLS: Study, Analysis, Design, Development, Implementation, Maintenance.
4. **Systems documentation consideration:** Principles of systems documentation, types of documentation and their importance, enforcing documentation discipline in an organization.
5. **System Planning:** Data and fact gathering techniques: Interviews, group Communication - questionnaires, Presentations and visits. Assessing project feasibility: Technical, Operational, Economic, Cost benefits analysis, Schedule, Legal and contractual, Political. Modern methods for determining system requirement: joint application, Development program, prototyping, Business Process re-engineering. System selection plan and proposal.
6. **Modular and Structured Design:** module specifications. Top-down and bottom-up design. Module coupling and cohesion. Structure charts.
7. **System Design and Modeling :** Process modeling , Logical and Physical design Conceptual Data modeling Entity- relationship analysis, Entity -relationship modeling, ERDs and DFDs, Concepts of normalization. Process description: Structured English, Decision tree, Decision tables. Documentation: Data dictionary, Recording data
8. **Input and Output:** Classification of forms, Input/output forms design. User-interface design, Graphical interfaces. Standards and guideline for GUI design. Designing physical files and databases: Designing field, Designing physical record, Designing Physical files, Designing database. Introduction to CASE tools, Feature, Advantages and Limitations of CASE tools, Awareness about some commercial CASE tools.
9. **System Implementation and Maintenance:** Planning consideration Conversion methods, Procedures and Controls. System acceptance criteria. System evaluation and performance. Testing and Validation. Preparing user manual .Maintenance activities and issues.
10. **Computer System Audit and Security:** Audit of Computer system usage. Types of threats to computer system control measures: Threat and risk analysis, Disaster recovery and contingency planning, viruses.
11. **OO Analysis/ Design:** Introduction to UML OO development life cycle and modeling .Static and dynamic modeling. Comparison of OO and module-oriented approach. Modeling using UML.
12. **Introduction to Management Information System (MIS) :** Meaning and role of MIS. System approach to MIS. Types of information systems: Transaction processing system, Management information system Decision support system, Expert system case studies (Illustrative) : MIS for accounting and function, MIS for marketing system.

**Subject Name:** Computer Network

1. **Introduction to Computer Networks:** Introduction, User of Networks: Goals and applications, OSI Reference Mode, Novell Netware, ARPANET, NSFNET, The Internet.
2. **The Physical Layer:** Transmission media, Twisted Pair, Baseband and Broadband Coaxial Cable, Fiber Optics, Wireless Transmission, Radio Transmission, Microwave Transmission, Infrared Transmission, Light Wave Transmission, ISDN Services, Virtual Circuits verses Circuit Switching, Transmission in ATM Network, Paging System, Cordless Telephone, Cellular Telephone, Communication Satellite.
3. **The Data Link Layer:** The data link Layer, Framing , Error Control, Flow- Control, Error Detection and Correction Protocols, Simplex Stop and Wait Protocols, One Bit sliding Window, Using Go- Back n, the Data link layer in the internet.
4. **The Medium Access Sub – Layer:** The Medium Access Sub Layer , Framing Static and Dynamic Channel Allocation in LAN and MANs ,IEEE standard 802.3 and Ethernet, IEEE standard 802.4 and Token Bus, IEEE 802.4 and Token Ring; Bridges, Bridges form 802x to 802y, Transparent Bridges, Source Routing Bridges.
5. **The Network Layer:** The network layer , network layer Design Issues, shortest Path routing, Flooding, Flow Based Routing , Broadcast Routing, Congestion Control and Prevention Policies, Internet Working,

Connectionless Internet Working , Tunneling Internet Work Routing, Fragmentation, Firewalls, IP Address Internet Control Protocols.

6. **The Transportation Layer:** The transportation Layer, The Transport Service, Transport Protocols, Addressing,, Establishing a Connection, Releasing a Connection, The Internet Transport Protocols, TCP.
7. **The Application Layer:** The Application layer, Network Security, Electronic mail, working of e-mail.

**Subject Name:** Data Structures Using C

### Unit-I

#### Basic Concepts

1. **Fundamental:** Data Structures, Algorithms and various types of applications.
2. **Basic Data Types:** Stack, Lists a7 recursion.

### Unit-II

#### Trees & Sets

1. **Trees:** Definition and implementation of binary tree, tree traversal, postfix, prefix notations, heap.
2. **Sets:** Definition and Implementation of hash table, priority queues.

### Unit-III

#### Algorithms & File Structure

1. **Sorting Algorithms :** Quick sort, insertion sort, Bubble sort, merge sort
2. **Searching Algorithms:** Linear search, Binary search, depth first search and Breadth first search techniques.
3. **File Structure:** Sequential, Index Sequential file Structure.

**Subject Name:** - Operating Systems

1. **Operating System Overview:** Introduction, Objectives and functions, Basic Elements, Evolution of Operating System, Instruction Execution, Interrupts, Memory, Memory Hierarchy, System Components, Operating system Services, System Calls, Virtual Machines, System Design and Implementation.
2. **Process Concepts:** Introduction, Process States, Process Control Block (PCB), Process Scheduling, Co-operating Processes, Threads, Inter Process Communications (IPC).
3. **CPU Scheduling:** Scheduling Criteria, Types of Scheduling, Scheduling Algorithms, Multiple-processor Scheduling, Real-time Scheduling, Disk-Scheduling Policies.
4. **Memory Management:** Introduction, Memory –management Requirements, Logical and Physical Address Space, Swapping, Loading Programs into main memory, Paging, Page Replacement Algorithms, Allocation Of Frames, Translation Look Aside Buffer (TLB), Simple Segmentation with Paging, page Size, Thrashing.
5. **File System:** Introduction, File Organization and Access Methods, Directory Structure, Protection, Security Threats, Intruders, Viruses, File-System Structure, File Allocation Methods, Free-Space Management, Directory Management, Efficiency and Performance of Secondary Storage.
6. **Deadlocks:** Introduction, Principles, Principles Of Deadlocks, System Model, Deadlock Characterization, Resource- allocation Graphs, Methods For Handling Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection on, Recovery from Deadlock.
7. **Process Management and Synchronization:** Introduction, Critical Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Message Passing.

**Subject Name:** Database Management System

1. **Basic - Concepts of Database Systems:** Database Schema, Instance and Database state, The Three-Schema Architecture, Data Independence, DBMS Languages, People Deal with Databases.
2. **Entry - Relationship Model:** The E- R Model, Entity Relationship Diagram, Composite versus Atomic Attributes, Role Names Recursive Relationships, Constraints on Relationship Types.
3. **Data Models and Its Implementation:** The Hierarchical Data Model, the Network Data Model, Network Modeling Concepts, the Relational Model.
4. **Introduction to Relational Model:** CODD'S 12 Rules for a fully relational DBMS, Basic Concepts of Relational Model, Referential Integrity Constraints, Enforcing Integrity Constraints.
5. **Oracle: A Relational Database Management System** Oracle System Structure,. Oracle Server, Oracle Database Structure, Oracle Schema Objects, Oracle Data Dictionary.
6. **Structured Query Language: SQL:** Three Parts of SQL, Sub-Queries, Referential Integrity, Some Other SQL Command.
7. **Procedural Language/ Structured Query Language:** PL/SQL Runtime Architecture (PL/SQL Engine), Procedure, Parameters, Packages, Cursors, Triggers.
8. **Relational Algebra and Relational Calculus:** Relational- Oriented Operation, Set-Oriented Operations and Union Compatibility, Aggregate Function and Grouping, Tuple Relation Calculus.
9. **Normalizing Database:** Benefits of Normalization, Function Dependency, The Domain Key Normal Form.
10. **Database Design and Tuning:** The Database Design Process, Requirements and Analysis, Choice of DBMS, Logical Database Design, Database Implementation and Tuning.
11. **Transaction Processing:** Concurrency Control, Recoverability.
12. **Query Processing and Query Optimization:** Query Processing, Query Optimization, Heuristics Rules in Query Optimization, Information used in Cost Function.
13. **Database Recovery Techniques:** Classification of Transaction Failures, Recovery Techniques Base on Deferred Update, Recovery Techniques Base on Immediate Update, Buffer Management.
14. **Concurrency Control Techniques:** The Acid Test for Transaction Management, Binary Locks, Serializability by Two-Phase Locking, Deadlock Problem.
15. **Data Warehousing:** Data Warehouse Definition, Data Form Legacy Systems, Decision- Support and Executive Information Systems.
16. **Data Mining and Web Mining:** Data Mining Techniques, Future Direction of Data Mining, Data Mining Techniques for Web Searching.
17. **Object- Oriented Database:** History Of OODBMS, Need for Abstract Data Types, O-O Features in SQL3, Hypertext Databases.
18. **Distributed Database:** Structure of Distributed Database, Design of Distributed Database, Advantage of Distributed Database, DDBMS Prototypes.

**Subject Name:** Object Oriented Programming Using C++

1. OOP paradigm , Advantages of OOP , Comparison between Functional Programming and OOP approach, characteristics of Object oriented Language objects, Class, Inheritance, Polymorphism, and abstraction, encapsulation, Dynamic Binding, Message passing.
2. Introduction to C++, Identifier and keywords, constants, C++ Operators, Type Conversion, variable declaration, Statement, expressions, User defined data types, Conditional expression (For, While, Do-while) loop statement , breaking control statement (Break, Continue).
3. Defining a function, type of functions, Inline functions, Call by value and Call by reference, Preprocessor, Header files and standard functions, Structures, Pointers and structures, Unions, Enumeration. **Classes**, Member functions, Objects, Array of objects, Nested classes, Constructors, Copy Constructors, Destructors, Inline member functions, Static class member, friend functions, Dynamic memory allocation.
4. Inheritance: Single inheritance, Multi-level inheritance, hierarchical, Virtual base class, Abstracts classes, Constructors in Derived classes, nesting of classes.

5. Function overloading , Operator overloading, polymorphism, Early binding, Polymorphism with pointers, Virtual functions, Late binding , Pure virtual functions, Opening and closing of files, Stream member function , Binary file operations, Structure and file operations, classes and file operations, Random access file processing.

**Subject Name:** Principle of Management

## Unit-I

### Planning and Organizing Management

1. **Definitions of Management:** Its Nature and Purpose, Management as a Science and art, the Elements of Science, Patterns of Management Analysis-Systems Approach to Operational Management. Function of Managers. Management and Society - Social Responsibility and Ethics with Reference to India and EN India. Operating in a pluralistic Society, Social Responsibility of Managers, ethic s in Managing. A Broad Overview of the Different Forms of Business Enterprises in India.
2. **Nature and Purpose of Planning:** Types of Plans; Steps in Planning Process - A Rational Approach to Goal Achievement. Objectives - The Nature of Objectives, Evolving Concepts in Management by Objectives (MBO), the Process of MBO, Setting Objective, Benefits and Weakness of MBO. The Nature and Purpose of strategies Planning Process , The TOWS Matrix, The Portfolio Matrix , Major Kinds of Strategies and policies, The Three Generic Competitive Strategies by Porter, Effective Implementation of Strategies , Premising and forecasting. Decision Making - The Importance and Limitations of Rational Decision Making, Evaluation of Alternatives, Selecting a Alternative, Programmed and Non-Programmed Decision , Decision Making Under Certainty , Uncertainty and risk, Modern Approaches to Decision Making under Uncertainty, Evaluating the Important for a Decision , Other Actor in Decision Making, Decision Support System , Systems Approach and Decision Making.
3. **Nature and Purpose of Organizing:** Formal and Informal Organization, Organizational Division - The Department, Organization Levels and the span of management, factors Determining an Effective span, organization Environment for Entrepreneur and Entrepreneur, The Structure and process of Reorganizing. Department by Simple Members, By time, by Enterprise function, by Territory or Geography , by Customer ,By Process or Equipment, and by Product. Matrix Organization, Strategic Business Units, Choosing the Pattern of Departmentation. Authority and Power, Line and staff concepts, Functional Authority, Benefits and Limitations of staff, Decentralization and Delegation of Authority, art of Delegation, Balance as a key to Decentralization.

## Unit-II

### Functional Methodology

1. **Human Resource Management and Selection :** Definition of Staffing, Defining the managerial job, Systems Approach to HRM- an Overview the Staffing function, Situational Factors Affecting Staffing , Selecting - Matching the Person with the job, Systems Approach , Position Requirements and job Design, Skills and Personal Characteristics Required by Managers, matching Qualifications with position Requirements, Selection-Process, Techniques and Instruments, Orienting and Socializing New Employees. Performance Appraisal -- Purposes and user of appraisal, Problem of Management Appraisal choosing The Appraisal Criteria, Traditional Trait Appraisals, Appraising Managers against Verifiable Objectives, Appraising Managers As Managers, Rewards and Stress of Managing, Formulating the Career Strategy. Manager Development Process and Training, Approaches to Managers Development, On -The- Job training and internal and external Training, Managing Changes, Organizational Conflict, Organizational Development.

**Controlling The Basis Control Process:** Critical Control points and Standards, Control as a Feedback System, real-time Information and control Feed Forward Control, requirements for Effective Controls. Budget- Traditional non-budgetary Control Devices, Time-even Network analysis, information technology, use of Computers in handling information, Challenges created by information technology. Control of Overall Performance, budget Summaries and report, Profit and loss Control, Control through return on investment, Direct Control v/s Preventive Control, Developing Excellent Mangers.