

## BCA – 11 COMPUTER FUNDAMENTALS

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

**Course Objective:** The objective of the course is to give basic competencies for application of a computer to everyday tasks using standard packages.

**Learning Outcomes:** At the end of the course a student is expected to:

1. Describe the organization and operation of a computer processor, primary and secondary memory, peripheral devices and to give computer specifications;
2. Explain the representation of data and information in computer systems,
3. Use standard word, and spreadsheets, graphics generation packages,
4. Use standard database system

### UNIT-I

Computer Fundamentals: Definition, Block Diagram along with its components, characteristics & classification of computers, Applications of computers in various fields.

Memory: Concept of primary & secondary memory, RAM, ROM, types of ROM, flash memory, Secondary storage devices: Sequential & direct access devices viz. magnetic tape, magnetic disk, CD, DVD.

### UNIT-II

Computer hardware & software: I/O devices, definition of software, relationship between hardware and software, types of software.

Overview of operating system: Definition, functions of operating system, concept of multiprogramming, multitasking, multithreading, multiprocessing, time-sharing, real time, single- user & multi-user operating system.

Computer Virus: Definition, types of viruses, Characteristics of viruses, anti-virus software.

### UNIT-III

Computer Languages: Analogy with natural language, machine language, assembly language, high- level language, compiler, interpreter, assembler

DTP tools : MS Word, MS Excel and MS Power Point

Windows and its tools

Multimedia, components and H/W-S/W requirements of multimedia.

Overview of Networking: An introduction to computer networking, Network types (LAN, WAN, MAN), Network topologies, introduction to internet and its uses.

#### UNIT-IV

Overview of Emerging Technologies: Bluetooth, wireless technologies: Bluetooth and wifi cloud computing, mobile computing and embedded systems, Virtual reality & Augmented Reality: Meaning and applications, IOT - Internet of Things: Meaning & Application.

#### Recommended Books:

1. Sinha, P.K. & Sinha, Priti, Computer Fundamentals, BPB
2. Dromey, R.G., How to Solve it By Computer, PHI
3. Balagurusamy E, Computing Fundamentals and C Programming, Tata McGraw Hill.
4. Norton, Peter, Introduction to Computer, McGraw-Hill
5. Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World
6. Rajaraman, V., Fundamentals of Computers, PHI
7. Ram, B., Computer Fundamentals, Architecture & Organization, New Age International (P) Ltd.

### BCA-12 PROGRAMMING IN C

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

**Course Objectives:** The course is designed to provide complete knowledge of C language. Students will be able to develop logics which will help them to create programs, applications in C.

**Learning Outcomes:** After the completion of this course:

1. The students will be able to develop applications.
2. By learning the basic programming constructs they can easily switch over to any other language in future.

#### UNIT-I

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Techniques of Problem Solving: Flowcharting, algorithms, pseudo code, decision table, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming. characteristics of a good programming language.

#### UNIT-II

Overview of C: History of C, Importance of C, Structure of a C Program. Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant. Input/output: Unformatted & formatted I/O function in C. Operators & Expression: Arithmetic, relational, logical, bitwise, unary, assignment, conditional operators and special operators. Arithmetic expressions, evaluation of arithmetic expression, type casting and conversion, operator hierarchy & associativity.

#### UNIT-III

Decision making & branching: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, goto statement.

Decision making & looping: For, while, and do-while loop, jumps in loops, break, continue statement.

### UNIT-IV

Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime. Functions: Definition, prototype, passing parameters, recursion. Arrays: Definition, types, initialization, processing an array, passing arrays to functions, Strings & arrays.

#### Recommended Books:

1. Gottfried, Byron S., Programming with C, Tata McGraw Hill
2. Balagurusamy, E., Programming in ANSI C, 4E, Tata McGraw-Hill
3. Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison Wesley.
4. Yashwant Kanetker, Let us C, BPB.
5. Rajaraman, V., Computer Programming in C, PHI.
6. Yashwant Kanetker, Working with C, BPB.

## BCA-13 DIGITAL ELECTRONICS

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

**Course Objectives:** The objectives are to study:

1. To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
2. To prepare students to perform the analysis and design of various digital electronic circuits.

**Learning Outcomes:** After studying this course the students:

1. To understand and examine the structure of various number systems and its application in digital design.
2. The ability to understand, analyze and design various combinational and sequential circuits.
3. Ability to identify basic requirements for a design application and propose a cost effective solution.
4. The ability to identify and prevent various hazards and timing problems in a digital design.
5. To develop skill to build, and troubleshoot digital circuits

### UNIT - I

Information Representation: Number Systems, Binary Arithmetic, Fixed-point and Floating-point representation of numbers, BCD Codes, Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Unicode

### UNIT - II

Binary Logic: Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables, Canonical and Standard forms of Boolean functions, Simplification of Boolean Functions – Venn Diagram, Karnaugh Maps.

### UNIT - III

Digital Logic: Basic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates – XOR,

XNOR etc. NAND, NOR, AND-OR-INVERT and OR-AND-INVERT implementations of digital circuits, Combinational Logic – Characteristics, Design Procedures, analysis procedures, Multilevel NAND and NOR circuits.

#### UNIT - IV

Combinational Circuits: Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor, Encoders, Decoders, Multiplexers, Demultiplexers, Comparators, Code Converters, BCD to Seven-Segment Decoder.

#### Recommended Books:

1. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
2. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
3. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
4. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

### BCA – 14 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

**Course Objectives:** The objectives are to study

1. to provide mathematical background and sufficient experience on various topics of discrete mathematics like matrix algebra, logic and proofs, graphs, algebraic structures, formal languages and finite state automata
2. Extend student's Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems

**Learning Outcomes:** After studying this course the students

1. Basic knowledge of matrix, set theory, functions and relations concepts needed for designing and solving problems.
2. Logical operations and predicate calculus needed for computing skill.
3. Design and solve Boolean functions for defined problems.
4. Apply the acquired knowledge of formal languages to the engineering areas like Compiler Design.
5. Apply the acquired knowledge of finite automata theory and to design discrete problems to solve by computers.

#### UNIT- I

Set, subsets and operations on sets, Venn diagram of sets. Power set of a set. Equivalence relation on a set and partition of a set, Permutation and combinations, Partially ordered sets, Lattices (definition and examples). Boolean algebra (definition and examples)

#### UNIT- II

Matrix algebra: Addition and multiplication of matrices, Laws of matrix algebra, Singular and non

singular matrices, Inverse of a matrix, Rank of a matrix, Rank of the product of two matrices, Systems of linear equations and their solutions. - uniqueness and existence of the solution.

### UNIT-III

**Measure of Central Tendency:** Mean, Arithmetic Mean, Geometric Mean, Harmonic Mean, Median, Mode. **Measure of Dispersion:** Range, Variance and Standard Deviations; Frequency Distributions and Cumulative Frequency Distributions.

**Probability:** concept of random experiment, equi-likely outcomes, sample space, favorable outcomes, probability of an event, basic rules of probability, addition and multiplication law of probability.

### UNIT-IV

**Probability distribution:** its meaning, types: discrete and continuous probability density/distribution functions: some probability distribution functions: Normal, Binomial, Poisson distribution. (basic characteristics and some numerical based on these distributions) **Correlation and Regression:** (basic characteristics and some numerical based on these)

#### Recommended Books:

1. Babu Ram : Discrete Mathematics
2. Shanti Naryana : A text book of matrices
3. Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons, 1996.
4. Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995
5. Freund John E, Mathematical Statistics, PHI, 2000

## BCA – 15 COMMUNICATION SKILLS

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

**Course Objectives:** The objectives are to study

1. in management is to convey information—instructions, policies, procedures, decisions, etc., so the listener will hear, read, understand what is said, agree and accept the message, and react as intended by the manager or sender of communication.

**Learning Outcomes:** After studying this course the students

1. Demonstrate critical and innovative thinking.
2. Display competence in oral, written, and visual communication.
3. Use current technology related to the communication field
4. Communicate ethically.

### UNIT-I

Basics of Communication- Definition and process of communication, Types of communication- formal and informal, oral and written, verbal and non-verbal, Self introduction, Greeting and starting a conversation,

Leave taking, Thanking, Wishing well, Talking about likes, dislikes and hobbies, Telephonic Conversation: general etiquette for making and receiving calls, Offering- Responding to offers, Requesting – Responding to requests, Congratulating, Exploring sympathy and condolences, Asking Questions- Polite Responses, Apologizing, forgiving, Complaining, Warning, Asking and giving information, Getting and giving permission, Asking for and giving opinions, Group Discussion, Debate,

### UNIT-II

Functional Grammar- Noun, pronoun, verb classification (Main Verb, Auxiliary Verb and modals), Punctuation, Prepositions, Framing Questions, Conjunctions, Tenses- Present, Past and Future, Voice- Active and Passive.

### UNIT-III

Reading Skill- Unseen passage for comprehension (one word substitution, prefixes, suffixes, antonyms, synonyms etc. based upon the passage should be covered under this topic), Newspaper reading; Introduction to e- book and the devices/ software used for reading e- book, Reading from online source; Various text file formats and the respective application software.

### UNIT-IV

Writing Skill- Application writing, Paragraph writing, Notice writing; Correspondence using Business Letters- Floating Quotations, Placing Orders, Complaint Letters; Official Letters- Letters to Government and other Offices; Memos, Circular, Office Orders; Agenda & Minutes of Meeting

#### Recommended Books:

1. Communication Techniques and Skills by R. K. Chadha; Dhanpat Rai Publications, New Delhi.
2. High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.
3. e-books/e-tools/relevant software to be used as recommended by DGHE/ UGC.

**BCA – 21**

**PROGRAMMING IN C++**

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

**Course Objectives:** The objectives are to study

1. To learn the syntax and semantics of the C++ programming language.
2. To understand the concept of data abstraction and encapsulation and how to overload functions and operators in C++.
3. To learn how inheritance and virtual functions implement dynamic binding with polymorphism.

**Learning Outcomes:** After studying this course the students

1. Describe the object-oriented programming approach in connection with C++
2. Apply the concepts of object-oriented programming
3. Understand the difference between the top-down and bottom-up approach

#### **UNIT – I**

Introduction: Introducing Object-Oriented Approach, Relating to other paradigms (functional, data decomposition). Basic terms and ideas: Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete operators.

#### **UNIT – II**

Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass/abstract classes.

#### **UNIT – III**

Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric polymorphism,

#### **UNIT – IV**

Generic function – template function, function name overloading, Overriding inheritance methods, Run time polymorphism, Multiple Inheritance. Files and Exception Handling: Persistent objects, Streams and files, Namespaces, Exception handling, Generic Classes

#### **Recommended Books:**

1. Yashwant Kanetker, “Let us C++”, BPB publications.
2. Balagurusamy, E., “Programming in ANSI C++”, 4e, Tata McGraw-Hill
3. Jeri R. Hanly & Elliot P. Koffman, “Problem Solving and Program Design in C++”, Addison Wesley.
4. Gottfried, Byron S., “Programming with C++”, Tata McGraw Hill
5. Behrouz A. Forouzan & Richard F. Gilberg, “Computer Science: A structured programming approach using C”, Cengage Learning
6. Ashok N. Kamthane, “Programming with ANSI and Turbo C”, Pearson Education.
7. Herbert Schildt, “The Complete Reference: C++”, Tata-McGraw-Hill.

### **BCA – 22 DATA STRUCTURE**

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

#### **Course Objectives:**

1. To provide the knowledge of basic Data structures and their implementation.
2. To understand importance of data structures in context of writing efficient programs.
3. To develop skills to apply appropriate data structures in problem solving.

**Learning Outcomes:**

Students will be able to:

1. Select appropriate data structures to specified problem definition.
2. Implement operations like searching, sorting, insertion, deletion and traversing on various data structures.
3. Determine and analyze the complexity of given Algorithms.

**UNIT-I**

Introduction to Data Structures, Data Types, Built in and User Defined Data Structures, Applications of Data Structure, Algorithm Analysis, Worst, Best and Average Case Analysis, Notations of Space and Time Complexity, Basics of Recursion.

Arrays, One Dimensional Arrays, Two Dimensional Arrays and Multi-Dimensional Arrays, Sparse Matrices,

Searching from array using Linear and Binary Searching Algorithm, Sorting of array using Selection, Insertion, Bubble, Radix Algorithm

**UNIT-II**

Stacks: Definition, Implementation of Stacks and Its Operations, Evaluation of Infix, prefix and Postfix Expression, Inter-conversion of Infix, Prefix and Post-Fix Expression, Implementation of Merge Sort and Quick Sort Algorithm.

Queues: Definition, Sequential Implementation of Linear Queues and Its Operations, Circular Queue and Its Implementation, Priority Queues and Its Implementation, Applications of queues.

**UNIT-III**

Linked Lists: Need of Dynamic Data Structures, Single Link List and Its Dynamic Implementation, Traversing, Insertion, Deletion Operations on Single Link Lists. Comparison between Static and Dynamic, Implementation of Linked List.

Circular Link Lists and Doubly Link List, Dynamic Implementation of Primitive Operations on Doubly Linked Lists and Circular Link List. Dynamic Implementation of Stacks and Queues.

**UNIT-IV**

Trees: Definition, Basic Terminology, Binary Tree, External and Internal Nodes, Static and Dynamic Implementation of a Binary Tree, Primitive Operations on Binary Trees, Binary Tree Traversals: Pre-Order, In-Order and Post-Order Traversals. Representation of Infix, Post-Fix and Prefix Expressions using Trees. Introduction to Binary Search Trees.

Graphs: Basic Terminology, Definition of Undirected and Directed Graphs, Memory Representation of Graphs, Minimum-Spanning Trees, Warshal Algorithm, Graph Traversals Algorithms: Breadth First and Depth First.

**Recommended Books:**

1. Theory and Problems of Data Structures by Jr. Seymour Lipschetz, Schaum's outline, TMH.
2. Data Structures and Algorithms by PAI, TMH.
3. Fundamentals of Data structures by Ellis Horowitz and Sartaj Sahni, Pub, 1983, AW.
4. Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
5. Data Structures and Program Design in C by Robert Kruse, PHI,
6. Shukla, Data Structures using C++, Wiley India



## BCA-23 COMPUTER ORGANIZATION

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory. Question No. 1. All questions will carry equal marks.

**Course Objectives:** The objectives are to study

1. the basics involved in data representation and digital logic circuits used in the computer system.
2. includes the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design.
3. will also expose students to the basic architecture of processing, memory and i/o organization in a computer system

**Learning Outcomes:** After studying this course the students

1. Identify, understand and apply different number systems and codes.
2. Understand the digital representation of data in a computer system.
3. Understand the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design.
4. Understand computer arithmetic formulate and solve problems, understand the performance requirements of systems

### UNIT - I

Sequential Logic: Characteristics, Flip-Flops, Clocked RS, D type, JK, T type and Master-Slave flip-flops. State table, state diagram and state equations. Flip-flop excitation tables

### UNIT - II

Sequential Circuits: Designing registers – Serial Input Serial Output (SISO), Serial Input Parallel Output (SIPO), Parallel Input Serial Output (PISO), Parallel Input Parallel Output (PIPO) and shift registers. Designing counters – Asynchronous and Synchronous Binary Counters, Modulo-N Counters and Up-Down Counters

### UNIT - III

Memory & I/O Devices: Memory Parameters, Semiconductor RAM, ROM, Magnetic and Optical Storage devices, Flash memory, I/O Devices and their controllers. Memory hierarchies, memory interleaving, problems of management of memory hierarchies, operation of virtual memories, Associative memories, Cache memories.

### UNIT - IV

Instruction Design & I/O Organization: Machine instruction, Instruction set selection, Instruction cycle, Instruction Format and Addressing Modes. I/O Interface, Interrupt structure, Program- controlled, Interrupt-controlled & DMA transfer, I/O Channels, IOP.

### Recommended Books:

1. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
2. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
3. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
4. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

## BCA – 24 OPERATING SYSTEM

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

**Course Objectives:** The objectives are to study

1. Describe the important computer system resources and the functions.
2. To study the process management and scheduling.
3. To understand the concepts and implementation Memory management policies and virtual memory.
4. To study the need for special purpose operating system with the advent of new emerging technologies

**Learning Outcomes:** After studying this course the students

1. Describe the important computer system resources and the functions.
2. To study the process management and scheduling.
3. To understand the concepts and implementation Memory management policies and virtual memory.

### UNIT – I

Introduction, What is an Operating System, Simple Batch Systems, Multiprogrammed Batches systems, Time-Sharing Systems, Personal-computer systems, Parallel systems, Distributed Systems, Real-Time Systems Memory Management: Background, Logical versus Physical Address space, swapping, Contiguous allocation, Paging, Segmentation Virtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations

### UNIT – II

Processes: Process Concept, Process Scheduling, Operation on Processes CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, MultipleProcessor Scheduling, Process Synchronization: Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization

### UNIT -III

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, SecondaryStorage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Reliability.

### UNIT -IV

Information Management: Introduction, A Simple File System, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File System File-System Interface: File Concept, Access Methods, Directory Structure, Protection, Consistency Semantics File-System Implementation: FileSystem Structure, Allocation Methods, Free-Space Management

**Recommended Books:**

1. Silberschatz and Galvin, "Operating System Concepts", Pearson, 5th Ed., 2001
2. Madnick E., Donovan J., "Operating Systems", Tata McGraw Hill, 2001

**BCA-25      SYSTEM ANALYSIS AND DESIGN**

**Maximum Marks: 100**

**Time: 3 hours**

**External: 80**

**Internal: 20**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

**Course Objectives:** The objectives are to study

1. The aim of this course unit is to understand the need for professional approach to develop an Information system and practice it.

**Learning Outcomes:** After studying this course the students will able to

1. Describe principles, concepts and practice of System Analysis and Design process
2. Explain the processes of constructing the different types of information systems

**UNIT – I**

**Overview of System Analysis and Design**

Introduction to System, Difference between Manual System and Automated System, Types of Systems, System Analyst, System Development Life Cycle.

**UNIT – II**

**Designing of a System**

Data Flow Diagrams (DFD), Data Dictionary, Pseudocode, The Process of System Design, Difference between Logical Design and Physical Design, Top-Down Design and Functional Decomposition, Forms-Driven Methodology.

**UNIT – III**

**File Organization and Data Base Design**

The Major Development Activities in Structured Design, Elements of Design, Introduction to File Organization, Data Base Design, Objectives of Data Base Design, The Role of DBA.

**UNIT – IV**

**System Testing and Implementation**

System Testing, Need for System Testing, Testing Strategies, Quality Assurance, Implementation.

**Maintenance**

Maintenance and its categories.

**Recommended Books**

1. Systems Analysis & Design: Awad Elias M.
2. Analysis & Design of Information Systems: Sen James A.
3. Introductory Systems Analysis and Design: Lee.
4. Systems Analysis & Design: Wetherbe James C.