BACHELOR OF INFORMATION TECHNOLOGY

FIRST YEAR

PAPER-I

SECTION - A (FUNDAMENTALS OF INFORMATION TECHNOLOGY)

UNIT-I (HARDWARE)

- Brief History of development of Computers.
- Computer System Concepts, Features & Limitations
- Basic components of Computer Hardware, CPU, Memory Unit & I/O Unit.
- CPU Organization - CU, ALU, Registers.
- Memory organisation -RAM, ROM, EPROM, PROM, Cache Memory
- I/O Organisation -VDU, Keyboard, Mouse and secondary I/O Devices
- Mass Storage Organisation - Magnetic Tape, Magnetic Disk, CD, DVD, Flash Storag Devices.
- Data Representation - Number systems - Binary, Decimal, Octal, 2's Complement, ASCII - EBCIDIC Codes.

UNIT-II (INTRODUCTION TO SOFTWARE)

- Types of Software
- System Softwares : Operating Systems, Command interpreters, Translators, Assemblers, Compilers, Interpreters
- Types of Operating Systems : Batch Processing, Single Process Monitors, Multiprogramming Real time, Online, Multiprocessing
- Programming Languages : Machine Language, Assembly Language, High Level Languages
- Application packages : Word Processors, Spread Sheets, Presentations, Other Utilities
- Computer Viruses : Working & spread of Viruses, Types, Control of Viruses
- Communication & Transmission
- Analog & Digital Signals
- Modulation - Demodulation (MODEM)
- Transmission Mode : Simplex, Half Duplex, Duplex
- Line Configuration : Point to Point, Multipoint
- Definition of computer networks
- Types : -LAN, WAN & MAN
- Topologies
- Communication Protocols

REFERENCES

1. COMPUTERS TODAY - by S. K. Basandra, Galgotia Publication
2. FUNDAMENTAL OF INFORMATION TECHNOLOGY - by Alexis Leon & Mathews Leon, Vikas Publishing House, New Delhi.
3. COMPUTER FUNDAMENTALS - by P. K. Sinha BPB Publications

SECTION - B (STRUCTURED PROGRAMMING USING 'C' LANGUAGE)

UNIT-I (PROGRAMMING CONCEPTS)

- Programs & Program Development
- Flow Charts
- DBMS vs Files
- Programming Technique : Structured Programming, Top-down approach, Bottom-up approach, Object Oriented Programming

UNIT-II 'C' PROGRAMMING LANGUAGE

- Overview - History & Features
- Structure of a C - Programme

- Variables, Expressions, Identifiers, Keywords, Data types & Constants
- Operators -Arithmetical, Logical, Relational, Conditional & Bitwise
- Operators Precedence & Associativity.
- 'C' - I/O - Charater Based & Formatted
- 'C' Control Statements : Decision Control - if, if—else, nested if-else
  Loops / Iteration - while, do-while, for-loops
  Break / continue / goto statements
- Arrays : Single & Multi Dimenstional
- Strings
- Functions : Call by Value & Call by Reference
- Introduction to pointers
- Recursion
- Structure & Unions
- C - Files

REFERENCES

1. PROGRAMMING IN C - by E. Balaagurusvamy, TMH Publications
2. PROGRAMMING WITH C - by Gottfried, Schaum Series TMH Publications
3. O LEVEL PROGRAMMING CONCEPTS SYSTEMS - by V. K. Jain, BPB Publications
3. 'C' COMPLETE REFERENCE - by Herbert Shield - TMH Publications

SECTION -C (INTRODUCTION TO IBM ARCHITECTURES)

- Microprocessors & Microprocessor Families
- Personal computers - IBM & Apple Series
- IBM PC Characteristics - PC / PCAT/ PCXT
- 8086 Architecture
- DMA Controllers Configuration
- VGA Controller
- Arithmetic Co-processor
- Clocks

REFERENCES

1. IBM PC - by Peter Norton
2. COMPUTER.QRGANISATION & ARCHITECTURE - by William Stallings, TMH Publications

FIRST YEAR
PAPER - II
SECTION - A (DATABASE MANAGEMENT SYSTEMS)
UNIT - I (DBMS BASICS)

- DBMS vs Files
- Organisation of DBMS
- Three Views & Schemas of DBMS
- DDL, DML, Queries, SQL
- Types of DBMS - Relational, Hierarchial & Network
- E-R Diagram.
- Generalisation, Specialisation, Aggregation

UNIT-II (RDBMS)

- Relation - Definition, Functional Dependency
- Domain, Attributes, Tuples, Fields
- Keys - Candidate Key, Primary Key, Foreign Key
- Codd's Rules
- Normalisation upto BCNF
- Example RDBMS - ORACLE (Practical Classes)

REFERENCES

1. DATABASE SYSTEM CONCEPT - by Korth & Silberschatz
2. AN INTRODUCTION TO DATABASE SYSTEM - by Bipin Desai
3. DATABASE MANAGEMENT SYSTEM - by Leon & Leon, Vikas Publications
4. AN INTRODUCTION TO DATABASE SYSTEM - by C.J. Date.

SECTION -B (OPERATING SYSTEM CONCEPTS)

UNIT - I (OS BASICS)

- Definition of OS
- Functions of OS
- Types of DS

UNIT-II (PROCESS MANAGEMENT)

- Process Definition
- PCB Process States
- FCFS, SJF, Round Robin
- LTS, STS, MTS
- Preemtive & Non-Preemtive Scheduling
- Deadlocks -Avoidance, Detection & Recovery
- Interprocess Synchronisation - Semaphores & Mutual exclusion

UNIT-III (MEMORY MANAGEMENT)

- Fixed & Dynamic Partitions
- Compaction
- Paging
- Segmentation
- Virtual memory, Page Replacement Algorithms

UNIT-IV (DEVICE MANAGEMENT)

- Overview - Types of I/O - Serial & Block I/O
- Programmed I/O
- Interrupt Driven I/O
- DMA
- Polling, Daisy-Chaining, Multiple Interupt lines
- Device Drivers & Device Controllers, BIOS, Device Independent Software

UNIT-V (FILE MANAGEMENT)

- Blocks, Sectors, Clusters, Directories
- Files - Concepts & Definitions
- Types of files & Organisation
- Disk Free Space Management
- Disk Free Space Allocation
- Disk Scheduling

UNIT-VI (DISK OPERATING SYSTEM (DOS))

- History & Versions
- Booting - FAT, Directory Structure
- DOS System Files
- DOS Commands - internal & external
- DOS - Batch Files

REFERENCES

1. OPERATING SYSTEM CONCEPT - by Golwin Silberschatz
2. OPERATING SYSTEMS - by Trannenbaum.
3. OPERATING SYSTEMS - by Dietel

SECTION -C (BASIC ELECTRONICS -1)

UNIT-I

- Types of resistance, Resistance symbol, Color code capacitors, Capacitors symbol, Code types, Mica & paper capacitor, Inductance, Conductor, Insulator, Band Theory, Intrinsic & extrinsic semiconductors, Theory of p-n junction, Capacitance & Diffusion capacitance.

UNIT-II

- Zener diode. Tunnel diode, Vector diode, Power diode, photo diode, LED, LCD. Point contract diode Schottky diode, Halfwave & fullwave rectifier with & without filter

UNIT-III

- BJT Characterisjtics, CE, CB, CC configurations, FET metal oxide, Semiconductors (MOSFET). CrJIOS, Unijunction transistor & Photo transistor.

UNIT-IV

- Single stage RC coupled amplifier frequency response class A, Class B, Class AB, Class C, Pu£ih pull amplifier, Efficiency distortion in amplifier their merits & demerits, BJT & FET RC coupled amplifiers.

UNIT-V

- Switching Characteristic BJT & FET, Monostable & Astable Multivibrators, RC integrators & | differentiators, Clipper & Clamber circuit.

REFERENCES

1. BASIC ELECTRONICS - by B. L. Thareja
2. BAS | C ELECTRONICS - by A. K. Sahani
3. BASIC ELECTRONICS - by V K Mehta

SECOND YEAR

PAPER - III

SECTION - A (DATA STRUCTURE)

- Dynamic Memory Allocation - Malloc (), Alloc (),
- Analysis of Algorithms.
- Arrays - Searching, Sorting, Insertion, Deletion, Merging.
- String - Manipulation.
- Linked Lists - Single & Double, Operations.
- Sparse Matrices - Operations.
- Stacks - Operations, Infix, Prefix & Postfix Notations.
- Queues - Operations, Circular & Deque.
- Trees - BS Tree, AVL-Tree, B-Tree, Heap
- Searching & Sorting Techniques.
- Graphs - Adjacency, DFS, BFS, Minimum Spanning Tree, Djkistra's & Kruskal's Algorithms.

SECTION -B (DISCREETE MATHEMATICS)

UNIT-I (BOOLEAN ALGEBRA)

- Introducaton to Boolean Algebra
- Basic Postulates
- Canonical Forms - Sum of Products & Product of Sums.
- Karnough Maps
- Simplification Using Karnough Maps.

UNIT-II (CIRCUIT DESIGN)

- Introducaton to Digital Logic
- Gates - Invertors, AND, OR, XOR, UNIVERSAL NAND GATE, UNIVERSAL NOR GATE, TRUTH TABLES AND LOGIC DIAGRAMS.

- Basic Circuits - Adders, Decoders, Encoders, Multiplexers, Flip-Flops etc.

SECTION - C (LINUX)

UNIT-I

- Basic Features, Advantages, Basic, Architecture of Unix / Linux Systme, Kernel, Shell.
- Linux File System-Boot - Block, Super Block, I-node Table, Data Blocks, 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, checking disk free spaces, Linux system stratup and shut-down process.

UNIT-II

- Understanding shells, Processes in linux, connectong processes with pipes, Redirecting input, output, Background processing, managing multiple processes, changing process priority, scheduling of processing at command, batch commands, kill, ps, who, sleep, Printing commands, find, sort, Cal, Banner, touch, file, file related commands-ws, cut, grep, dd, etc, Mathematical, Commands-bc, expr, factor, units.

SECOND YEAR

PAPER - IV

SECTION -A (OBJECT ORIENTED PROGRAMMING USING C++)

UNIT - I (BASICS)

- Objects
- Classes
- Polymorphism
- Reusability
- Inheritance
- Message - Passing
- Genericity.

UNIT - II ©++ PROGRAMMING LANGUAGE)

- History & Features, Introduction of Classes, Comparision / Additional Features to C-Language.
- Object Oriented Features in C++
- Scope Resolution Operator
- Static Data Member
- Static Function
- Passing Object of Function
- Returning Objects.
- Constructors & Destructors
- Function Overloading in C++, Operator Overloading in C++
- Inline Function, Friend Function
- Inheritance - Single, Multiple, Multilevel
- Virtual Functions
- Void Pointers
- Pure Virtual Function
- Function Templates & Class Templets.

SECTION - B (COMPUTER NETWORKING & INTERNET)

UNIT - I

- Need & Advantages of Networks, Types : Server based, Peer based, Hybrid.
- Topology, Network media types, H/w Protocol, Software protocols, digital singaling, analog, signaling, bit synchronization, base band and broad band' transmission.

UNIT - II

- OSI and IEEE 802 Model, IEEE 802.3, IEEE 802.4 IEEE 802.5 & fast Ethernet FDDI, ATM, LAN access techniques, Bit map protocol.

UNIT - III

- Connectivity, Hubs, Repeaters, Bridges, Multiplexeres, Router, Gateways, Modem, Types of Modem, Modulation Schemes.

UNIT-IV

- Internet V/s Intranet, growth of Internet, ISP, Connectivity-Dial up and Leased line, URL, Domain name, Portals Application, POP & Web based e-mail, merits, IP addressing.
- Basics of sending & receiving e-mails.

UNIT - V

- Internet Chatting, WWW, HTTP, URL, HTML.
- Over view of e-commerce, Internet, e-business, Advantage of E-commerce.

SECTION - C (DIGITAL COMPUTER ORGANISATION)

UNIT - I

- CPU ORGANIZATION : ALU & Control Circuit, Idea about Arithmetic -Circuits Program Control, Instruction Sequencing.

UNIT - II

- INPUT-OUTPUT ORGANIZATIONS : I/O Interface, Properties of simple I/O devices and their controller, Isolated Versus memory-mapped - I/O, Modes of Data transfer, Synchronous & Asynchronous Data transfer, Handshaking, Asynchronous serial tansfer, I/O Processor.

UNIT - III

- Memory organization : Memory Hierarchy,Auxiliary memory,Magnetic drum,Disk & Tape,Semi- conductor memories,Associative,memory,virtual Memory,Address Space & Memory space,Addressmaping,Page table,Page Replacement,Cache memory ,Hit Ratio,Various mapping techniques,writing into Cache.

THIRD YEAR

PAPER - V

SECTION - A (JAVA PROGRAMMING)

UNIT - I

- C++ Vs Java, Java, Internet and WWW, Java support systems, Java environment, Java Program Structure, Tokens, Statements, Java Virtual machine, Expressions & its Evaluation, Data Types, Type Casting, Operators, Expressions & its Evaluation, Decision making and branching, Loops, Jumps in Loops, Labeled Loops.

UNIT-II

- Defining a class, Adding variables and method, Creating objects, Assessing class members, Constructors, Method overloading, Static members, Nesting of methods, Inheritance : Extending a class, Overriding methods, Final variables and methods, Final classes, Finalizer methods, Abstract methods and classes, Visibility control.

UNIT-III

- Arrays, One dimensional & two dimensional, Strings, Vectors, Wrapper classes, Defining interfaces, Extending interfaces, Implementing interfaces, Accessing interface Variables, System packages, Using Systerm packages, Naming Conventions, Creating packages, Accessing a packages, Using package, Adding a class to a package, Hiding classes.

UNIT - IV

- Threads, Creating threads, Extending the threads class, Stopping and blocking a thread, Life cycle of a thread, Using thread methods, Thread exceptions, Thread priority, Synchrozation, Implementing the runnable interface.

UNIT - V

- Applets, Local and remote applets, Applets Vs applications, Writing applets, Applets life Cycle, Creating an executable applet, Designing a web page, Applet tag, Adding applet to HTML file, Running the applet, Passing parameters to applets, Aligning to display, HTML tags & applets, Getting input from tag user.

SECTION - B (INTERNET AND WEB DESIGNING)

UNIT- I

- Introduction to Internet Applications: Introduction to Internet, WWW, News group, E-mail, Messaging Protocols, Internet Protocols (HTTP, FTP, TFTP, DNS, SMTP, IMAP, POP and TCP/ IP), Setting up Internet connection using Dial-up and leased-line (Broadband). Creating E-mail,, Sending mails, Attachments, using FTP Services.

UNIT - II

- Web Page Desiging :- using different browsers. (Internet Explorer/Netscape Navigator) Browsing internet and E-mail service providers, Features of internet Services (Chatting, Conferencing), MIRC. HTML & DHTML: HTML Tags, Designing Tables, Frames, and Forms, Placing images, animation and Sound on Sites. Using Hit Counter. Adding VBScript code to html pages, Scripting Functions. Hosting your website using The Free hosting Sites like yahoo, Angelfire, etc.

UNIT - III

- Server side programming using ASP. :- Asp objects, DOM, Database accessing on Web, Using Forms to perform Query in Databases

SECTION - C (INTRODUCTION TO NETWORK SECURITY)

UNIT-I

- Introduction :- Networking Terminologies, Active Vs Passive Attacks, Viruses, Worms, Trojan Lorser. The Multi Level Model of Security, Legal Issues. Introduction, Breaking an Encryption Scheme, Types of Cryptographic Functions-Secret Key, Public Key, and Hash Algorithms. Data Encryption Standards, International Data, Encryption algorithm, Advanced Encryption Standard, RC4 Modes of Operation, encrypting a large message, Generationg MACs, Multiple Encryption DES. Public Key Algorithm, Modular Arithmetic, RSA, Diffle-Hellman, Digital Signature Standard.

UNIT - II

- Authentication :- Password based, Address based, Cryptographic authentication protocols, Eavesdropping and Server Databse reading, Trusted Intermediaries, Session Key, Authentication of People Security Handshake pitfalls. Electronic Mail Security, PGP (Pretty Good Privacy). Firewalls, Web Issues.

THIRD YEAR

PAPER-VI

SECTION - A (VISUAL PROGRAMMING WITH VISUAL BASIC)

UNIT-I

- Visual Programming : The Fundamental of Visual Basic, Introduction, VB Editions, Working with Visual Basic, IDE, The elements of the user-Interface, Designing the user-Interface, Programming an application, Visual Development and Event-Driven Programming, Customizing the environment.

- Visual Basic as Language: Visual basic projects, the project files, variables, constants, Arrays, collections, procedures, agruments, function returns values, control flow statements, looping statements, nested control structures, exit statement.
- Working with forms : The appearance of the form, designing menus, building dynamic forms, drag and drop operations, mouse conflicts.
- Basic Active X Controls : The textbox control, the list box and combo box controls, the scroll bar and slider controls, the file controls.
- Advanced Active X controls : The Common dialogs control, use of the common dialog control, the tree view and List view controls, the richtext box control, RTF language, msflexgrid control.
- Multiple Document Interface: MDI applications, parent and child MDI forms, Accesing child forms, Implementing scrolling forms.
- Database Programming with VB : The Active date objects, data environment, SQL, DAO, Library, Report designing using data report. Interfacing with MS-Access & Oracle database.

SECTION - B (SQL SERVER)

UNIT -I

- Introduction : SQL Server 2000, Relational Database Management System and Conventional database systems. Installing SQL Server. Working with Enterprise Manager. Configuring a Database, Creating Tables, Views, Defining constraints, Creating relationships. Designing Database Diagram. Creating Indexes. Creating user-defined data types, Creating Stored Procedures and Function.
- Working with Query Analyzer, Writing queries, Using relational operators like project, join, Intersect, union, difference. Built-in SQL functions. Performing data manipulation from query analyzer. Query optimization.
- Using OLEDB, ADO for interfacing with front-end applications designs in VB, Java etc.

SECTION - C (SYSTEM ANALYSIS & DESIGN)

UNIT -I

- SYSTEM CONCEPTS : The system concept, Characteristics of system, Elements of system, Types of system, man made information systems.
- SYSTEM DEVELOPMENT LIFE CYCLE : Recognition of need, Feasibility study, Analysis, Design, Implementation, post implementation and Maintenance, System planning and control.
- SYSTEM PLANNING AND INITIAL INVESTIGATION: Bases for Planning system analysis, Determining users requirements and analysis, Fact finding, Determination of feasibility.
- TOOLS OF STRUCTURED ANALYSIS: Logical and Physical Models, Data flow diagram, Data dictionary, System structured charts, System model, Pseudo codes, Decision tree, Decision tables, HIPO chart, Gantt charts, Warnier diagram.
- FEASIBILITY STUDY : System performance constraints, identification of system objective, feasibility analysis and report.
- SYSTEM DESIGN : Stages of system design, Logical and Physical design methods, Form driven methodologies, IPO and HIPO charts, Structured walk through, Audit considerations: Processing controls, Data validation, Audit - trail and documentation control.

Paper - VII — **Practical - 100 Marks**

Paper - VIII — **Project and Viva-Voce - 100 Marks**