SCHEME OF EXAMINATION
&
DETAILED SYLLABUS

BACHELOR OF COMPUTER APPLICATIONS
(BCA)

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SCHEME FOR BACHELOR OF COMPUTER APPLICATIONS (BCA)

SEMSTER - I

Subject Code	Subject Name	Marks
Theory Group		
1BCA1	FUNDAMENTALS OF COMPUTERS & INFORMATION TECHNOLOGY	100
1BCA2	PROGRAMMING METHODOLOGY AND C PROGRAMMING	100
1BCA3	OFFICE AUTOMATION PACKAGES	100
1BCA4	DISCRETE MATHEMATICS	100
1BCA5	COMMUNICATIVE ENGLISH	100
Practical Group		
1BCA6	COMPUTER LAB I:OPERATING SYSTEMS, WORD, EXCEL & POWERPOINT	100
1BCA7	COMPUTER LAB II : C PROGRAMMING	100

SEMESTER – II

Subject Code	Subject Name	Marks
Theory Group		
2BCA1	DIGITAL ELECTRONICS	100
2BCA2	OBJECT ORIENTED PROGRAMMING WITH C++	100
2BCA3	DATA BASE MANAGEMENT SYSTEMS	100
2BCA4	MATHEMATICS FOR COMPUTING	100
2BCA5	PRINCIPLES OF MANAGEMENT	100
Practical Group		
2BCA6	COMPUTER LAB III: C++	100
2BCA7	COMPUTER LAB IV: MS-ACCESS	100
2BCA8	SUMMER ASSIGNMENT & SEMINAR	100

SEMESTER – III

Subject Code	Subject Name	Marks
Theory Group		
3BCA1	DATA STRUCTURES USING C/C++	100
3BCA2	INTERNET & WEB DEVELOPMENT	100
3BCA3	OPERATING SYSTEMS	100
3BCA4	NUMERICAL METHODS	100
3BCA5	MULTIMEDIA TOOLS AND APPLICATIONS	100
Practical Group		
3BCA6	COMPUTER LAB V: DATA STRUCTURES & NUMERICAL METHODS	100
3BCA7	COMPUTER LAB VI : INTERNET AND WEB DEVLOPMENT	100

SEMESTER - IV

Subject Code	Subject Name	Marks
Theory Group		
4BCA1	INFORMATION SYSTEMS ANALYSIS AND DESIGN	100
4BCA2	RDBMS USING ORACLE	100
4BCA3	PROGRAMMING WITH VISUAL BASIC.NET	100
4BCA4	COMPUTER NETWORKS	100

4BCA5	MATHEMATICAL STATISTICS	100
Practical Group		
4BCA6	COMPUTER LAB VII: VB.NET	100
4BCA7	COMPUTER LAB VIII: ORACLE	100
4BCA8	PROFESSIONAL PERSONALITY DEVELOPMENT-I & SEMINAR	100
4BCA9	MINOR PROJECT	100

SEMESTER – V		
Subject Code	**Subject Name**	**Marks**
Theory Group		
5BCA1	SOFTWARE TESTING AND PROJECT MANAGEMENT	100
5BCA2	PROGRAMMING WITH JAVA	100
5BCA3	WEB DEVLOPMENT USING ASP.NET & C#	100
5BCA4	LINUX & SHELL PROGRAMMING	100
5BCA5	ENTREPRENEURSHIP DEVELOPMENT & ENVIRONMENT STUDIES	100
Practical Group		
5BCA6	COMPUTER LAB IX:JAVA	100
5BCA7	COMPUTER LAB X: LINUX & SHELL PROGRAMMING	100
5BCA8	PROFESSIONAL PERSONALITY DEVELOPMENT-II & SEMINAR	100

SEMESTER – VI (6 MONTHS PROJECT WORK)		
Practical Group		
6BCA1	MAJOR PROJECT	400
6BCA2	INTERNAL ASSESSMENT & SEMINAR	200

1BCA1 - FUNDAMENTALS OF COMPUTERS AND INFORMATION TECHNOLOGY

UNIT – I
Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic components of a computer system - Control unit, ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

UNIT – II
Input/Output & Storage Units-:Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers& types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, SIMM, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk , Blue Ray Disc, SD/MMC Memory cards, Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW.

UNIT – III
Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux, File Allocation Table (FAT & FAT 32), files & directory structure and its naming rules, booting process details of DOS and Windows, DOS system files Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention, viruses on network.

NOTE:- Practical exposure to be given for DOS commands Questions may be asked in theory paper.

UNIT – IV
Use of communication and IT , Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band ,Types of Network - LAN, WAN, MAN ,Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways.

Internet-Evolution, World Wide Web Internet Services, Convergence of technologies.

UNIT-V

Management information system - Introduction, Characteristics, Needs, Different views of MIS, Designing, Placement of MIS, Pitfalls in Designing an MIS, Computer based MIS – Advantages & Disadvantages.

Computer Applications in Business-Need and Scope, Computer Applications in Project Management, Computer in Personnel Administration, Information System for Accounting-Cost and Budgetary Control, Marketing and Manufacturing, Computer Applications in Materials Management, Insurance and Stock-broking, Production planning and Control, Purchasing, Banking, Credit and Collection, Warehousing.

Use of computers in common public services and e-governance.

TEXT & REFERENCE BOOKS :
- Anurag Seetha, "Introduction to Computers and Information Technology", Ram Prasad & Sons, Bhopal.

- S.K.Basandra, "Computers Today ", Galgotia Publications.

- Alexis Leon & Mathews Leon, " Fundamentals of Information technology ", Vikas Publishing House, New Delhi.

- Rajeev Mathur, " DOS Quick reference ", Galgotia Publications

1BCA2 - PROGRAMMING METHODOLOGY AND C PROGRAMMING

UNIT – I
Program Concept, Characteristics of Programming, Various stages in Program Development Programming aids Algorithms, Flow Charts - Symbols, Rules for making Flow chart, Programming Techniques – Top down, Bottom up, Modular, Structured - Features, Merits, Demerits, and their Comparative study. Programming Logic- Simple, Branching, Looping, Recursion, Cohesion & Coupling, Programming Testing & Debugging & their Tools .

UNIT – II
Introduction to C language, C language standards features of C, Structure of C program.

Introduction to C compilers, Creating and compiling C Programs, IDE features of Turbo C compiler, Command line options to compile C program in TC.

Keywords, Identifiers, Variables, constants, Scope and life of variables - local and global variable. Data types, Expressions, Operators : Arithmetic, Logical, Relational, Conditional and Bit wise Operators. Precedence and Associativity of Operators, Type conversion.

Basic input/output library functions: Single character input/output i.e. getch(), getchar(). getche(), putchar(). Formatted input/output i.e. printf() and scanf().

Library functions : Mathematical & Character functions.

UNIT – III
Declaration statement, conditional statement : If statement, If.....Else statement, Nesting of If....Else Statement, else if ladder, The ?: operator, Switch statement. Iteration statements: for loop, while loop, do-while loop. Jump statements: break, continue, goto exit().

ARRAYS : concept of Single and Multi Dimensional arrays, Array declaration and initialization of arrays

Strings : declaration, initialization, functions.

UNIT – IV
The need of C functions, User defined and library function, prototype of functions, prototype of main() function, Calling of functions, Function arguments, argument passing: call by value and call by reference, Return values. Nesting of function, Recursion, Array as function argument, Command line arguments.

Storage class specifier - auto, extern, static, register.

UNIT – V
Defining structure, Declaration of structure variable, typedef, Accessing structure members, Nested structures, Array of structure, Structure assignment, Structure as function argument, Function that return structure, Union.

Concept of debugging. Finding Errors in the programs, error codes and their meanings, Various debugging options in Turbo C compiler. (Debug and Options Menu of the TCC IDE)

TEXTS & REFERENCE BOOKS :

- E. Balaguruswamy, "Programming In C ", TMH Publications

- Gottfried, Schaums Outline Series, " Programming With C ", TMH Publications

- Mahapatra, " Thinking In C ", PHI Publications

- Anurag Seetha, "Introduction To Computers And Information Technology ", Ram Prasad & Sons, Bhopal.

- S.K.Basandra, " Computers Today ", Galgotia Publications.

- Peter Juliff, " program design ", PHI Publications

1BCA3 - OFFICE AUTOMATION PACKAGES

NOTE:-
1. Theory and Practical of this course is based on at least Windows XP and MS Office XP Version, newer versions can also be used for performing practical in Lab.

2. Demonstration of StarOffice and OpenOffice must be given in the classroom, comparison can be asked in the theory & practical exam

UNIT – I
MS Windows: Introduction to M.S. Windows; Features of Windows; Various versions of Windows & its use; Working with Windows; My Computer & Recycle bin ; Desktop, Icons and Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbars; Working with Files & Folders; simple operations like copy,delet,moveing of files and folders from one drive to another, Shortcuts & Autostarts; Accessories and Windows Settings using Control Panel- setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hardware & Software program on your computer.

UNIT – II
Office Packages-Office activates and their software requirements, Word-processing, Spreadsheet, Presentation graphics, Database, introduction and comparison of various office suites like MSOffice, LotusOffice, StarOffice, OpenOffice etc.

MS Word Basics: Introduction to MS Office; Introduction to MS-Word; Features & area of use. Working with MS Word.; Menus & Commands; Toolbars & Buttons; Shortcut Menus, Wizards & Templates; Creating a New Document; Different Page Views and layouts; Applying various Text Enhancements; Working with – Styles, Text Attributes; Paragraph and Page Formatting; Text Editing using various features ; Bullets, Numbering, Auto formatting, Printing & various print options

UNIT-III
Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Autotexts, Symbols etc.; Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding References and Graphics; Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats.

UNIT – IV
MS Excel: Introduction and area of use; Working with MS Excel.; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options.

UNIT – V

MS PowerPoint: Introduction & area of use; Working with MS PowerPoint; Creating a New Presentation; Working with Presentation; Using Wizards; Slides & its different views; Inserting, Deleting and Copying of Slides; Working with Notes, Handouts, Columns & Lists; Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects; Designing & Presentation of a Slide Show; Printing Presentations, Notes, Handouts with print options.

Outlook Express: Features and uses, Configuring and using Outlook Express for accessing e-mails in office.

Text & Reference Books:
- Windows XP Complete Reference. BPB Publications.
- MS Office XP complete BPB publication.
- MS Windows XP Home edition complete, BPB Publications.

1BCA4 – DISCRETE MATHEMATICS

UNIT-I
Statements, logical connectives, truth tables. tautologies, contradictions, logical equivalence. Applications to everyday reasoning.

UNIT–II
An axiom system for the sentence calculus. Truth tables as an effective procedure for deciding logical validity. Relation of sentence calculus to Boolean algebra.

UNIT-III
Quantifiers: Universal and existential quantifier. Predicate calculus. Axiom system for predicate calculus. Application to everyday reasoning.

UNIT-IV
Sets and classes. Relations. Equivalence relation and equivalence classes. Partial order relation, lub and glb. Trees and lattices. Mappings: injective, surjective and bijective mappings. Cardinality. Finite and infinite sets.

UNIT-V
Definition and basic properties of: semigroups and groups, rings, integral domains, and fields.

UNIT-VI
Vector spaces and algebras. Linear dependence and independence. Bases. Linear transformations and their representation as matrices. Invertible linear transformation and invertible matrix. Geometrical interpretation of determinant of a 2x2 matrix

TEXTS AND REFERENCE BOOKS:-
- S.S.SASTRY, "Engineering Mathematics", Prentice Hall of India

- Bernard Kolman, Robert C.Busby, Sharon Ross, "Discrete Mathematical Structures Engineering Mathematics "

1BCA5 - COMMUNICATIVE ENGLISH–I

OBJECTIVE:

This course is designed on a predominantly communicative or interactive approach to the learning of English. This approach is based on the belief that language is not a body of knowledge to be learnt but a skill to be acquired. Student acquires the ability to use the language fluently effectively, correctly, confidently and naturally in real life situations that is to say, they imbibe and internalize the language. However, the approach is to encourage the learners to formulate and express their ideas and offer ample scope for creativity. The approach has been aimed at an integrator development of the four basic skills - Listening, speaking, reading and writing.

FUNCTIONAL GRAMMAR

UNIT–I
- Sentences : Simple, Compound, Complex, Assertive, Interrogative, Imperative, Exclamatory.
- Parts of Speech
- Adverb and Adjective
- Articles : Usage of 'A', 'AN', 'THE'
- Preposition : Position of Prepositions, Place Relations Time Relations and other relations.
- Common Errors

UNIT–II
- Functional Grammar :
- Tenses : Simple Present, Progressive Perfect, Present Perfect Progressive along-with Past Tense and indications of futurity
- Reported speech
- Modals : Will, Shall Should, Would and others
- Voice : Active and Passive

UNIT III
- Introduction – Ourselves and others
- Paragraph writing
- Prece Writing,
- Job Applications, Curriculum Vitae
- Comprehension Written

UNIT-IV
- Vocabulary :

- Words Commonly Misspelt
- Word formation by prefix suffix
- Synonyms and antonyms

UNIT-V
- Literature : Lessons and Poems from M.P. Universities' 1st year Foundation Course book and Written Communication by Sarah Freeman

TEXT BOOKS:
- "English Language and Indian Culture" - M.P.Universities' 1st year Foundation Course published by M.P.Hindi Granth Academy, Bhopal [Complete]
- "Written Communication in English" by Sarah Freeman published by Orient Longman [Units I and II only]

REFERENCE BOOKS:
- A Practical English Grammar by Thomson and Martinet
- English Grammar by W.S.Allen

SEMESTER-II
2BCA1– DIGITAL ELECTRONICS

UNIT – I
Data types and Number systems, Binary number system, Octal & Hexa-decimal number system,1's & 2's complement, Binary Fixed- Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow, Floating Point Representation, Codes, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD, Error detection & correcting codes

UNIT – II
Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates, Boolean Algebra, Basic Boolean Law's, Demorgan's theorem, MAP Simplification, Minimization techniques, K -Map, Sum of Product & Product of Sum

UNIT – III
Combinational & Sequential circuits, Half Adder & Full Adder, Full subtractor, Flip-flops - RS, D, JK & T Flip-flops, Shift Registers, RAM and ROM, Multiplexer, Demultiplexer, Encoder, Decoder, Idea about Arithmetic Circuits, Program Control, Instruction Sequencing

UNIT – IV
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 transfer, I/O Processor

UNIT – V
Auxiliary memory, Magnetic Drum, Disk & Tape, Semi-conductor memories, Memory Hierarchy, Associative Memory, Virtual Memory, Address space & Memory Space, Address Mapping, Page table, Page Replacement, Cache Memory, Hit Ratio, Mapping Techniques, Writing into Cache

TEXT & REFERENCE BOOKS :
- BARTEE, "Digital Computer Fundamentals " TMH Publication ISBN 0-07-003899-6

- MALVINO, " Digital Computer Electronics " TMH Publication ISBN 0-07-462235-8

- MORRIS MANO, "Computer System Architecture " PHI Publication ISBN 81-203-0417-9

2BCA2-OBJECT ORIENTED PROGRAMMING WITH C++

UNIT-I
- Overview of C++ : Object oriented programming, Concepts, Advantages, Usage. C++ Environment: Program development environment, the language and the C++ language standards. Introduction to various C++ compilers, C++ standard libraries, Prototype of main() function, Data types.

- Creating and compiling C++ Programs using IDE and through command line, IDE features for compiling, debugging, tracing and testing the C++ program in Turbo C++/Borland C++/MicroSoft VC++/GNU C++ compiler.

- Classes & Objects : Classes, Structure & classes, Union & Classes, Friend function, Friend classes, Inline function, Scope resolution operator, Static class members, Static data member, Static member function, Passing objects to function, Returning objects, Object assignment.

UNIT-II
- Array, Pointers References & The Dynamic Allocation operators : Array of objects, Pointers to object, Type checking C++ pointers, The This pointer, Pointer to derived types, Pointer to class members, References: Reference parameter, Passing references to objects, Returning reference, Independent reference, C++ 's dynamic allocation operators, Initializing allocated memory, Allocating Array, Allocating objects.

- Constructor & Destructor : Introduction, Constructor, Parameterized constructor, Multiple constructor in a class, Constructor with default argument, Copy constructor, Default Argument, Destructor.

UNIT-III
- Function & operator overloading : Function overloading, Overloading constructor function finding the address of an overloaded function, Operator Overloading: Creating a member operator function, Creating Prefix & Postfix forms of the increment & decrement operation, Overloading the shorthand operation (i.e. +=,-= etc), Operator overloading restrictions, Operator overloading using friend function, Overloading New & Delete, Overloading some special operators, Overloading [ ], ( ), -, comma operator, Overloading << .

UNIT-IV
- Inheritance : Base class Access control, Protected members, Protected base class inheritance, Inheriting multiple base classes, Constructors, destructors & Inheritance, When constructor & destructor function are executed, Passing parameters to base class constructors, Granting access, Virtual base classes .

- Virtual functions & Polymorphism : Virtual function, Pure Virtual functions, Early Vs. late binding

UNIT-V
- The C++ I/O system basics : C++ streams, The basic stream classes: C++ predefined streams, Formatted I/O: Formatting using the ios members, Setting

the format flags, Clearing format flags, An overloaded form of setf ( ), Examining the formatted flags, Setting all flags, Using width() precision() and fill(), Using manipulators to format I/O, Creating your own manipulators.

TEXT & REFERENCE BOOKS :

- Herbert Schildt, "C++ The Complete Reference " - TMH Publication ISBN 0-07-463880-7

- R. Subburaj, "Object Oriented Programming With C++ ", Vikas Publishing House, New Delhi.isbn 81-259-1450-1

- E. Balguruswamy, "C++ ", TMH Publication ISBN 0-07-462038-x

- M Kumar "Programming In C++", TMH Publications

- R. Lafore, "Object Oriented Programming C++ "

- Ashok . N. Kamthane, "Object Oriented Programming with ANSI & Turbo C++", Pearson Education Publication, ISBN 81-7808-772-3

2BCA3-DATABASE MANAGEMENT SYSTEMS

UNIT-I
Operational data, Purpose of database system, Views of data, Data models: Relational, Network, Hierarchical, Instances & Schemes, Data Dictionary, Types of Database languages : DDL, DML, Structures of a DBMS, Advantages & Disadvantages of a DBMS,3-level Architecture Proposal : External, Conceptual & Internal Levels, Entity Relationship Model as a tool of conceptual design : Entities & Entity set, Relationship & Relationship set, Attributes, Mapping Constraints, Keys, Entity-Relationship diagram (E-R diagram) : Strong & weak entities, Generalization, Specialization, Aggregation, Reducing ER diagram to tables

UNIT-II
Set theory concepts and fundamentals: Relations, Domains, Attributes, Tuple, Concepts of Keys: Candidate key, Primary Key, Alternate Key, Super Key, Foreign Key, Fundamental integrity rules: Entity integrity, Referential integrity, Extension & Intention

Functional Dependencies, Good & Bad Decomposition, Anomalies as a database: A consequences of bad design, Universal Relation, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF 5NF.

UNIT-III
Relational Algebra: Select, Project, Cross product, Different types of joins i.e. theta join, equi-join, natural join, outer join, set operations .

Structured query language(SQL),Using MS Access, Implementing SQL Functions, Integrity, Indexing, View Using MS Access.

DBA – Role, Functionality and Importance.

UNIT-IV
Failure Classification, The Storage Hierarchy, Transaction Model, Storage and File Structure, RAID, Storage Access, File Organization, Organization of Records in File, Data Dictionary storage.

UNIT-V
Database functionality and Importance.

Database system architectures-centralized system, client server system, parallel system, distributed system. Overview Database on Web- concepts of ODBC, DSN.

TEXT & REFERENCE BOOKS :
- "Database Management System" bY Leon & Leon, Vikas Publications.
- "Database System Concepts" by Henry F.Korth & Abraham Silberschatz .
- "an introduction to database system" by Bipin C.Desai.
- "An Introduction To Database System" by C.J.Date.

2BCA4 – MATHEMATICS FOR COMPUTING

UNIT – I
Derivative as tangent to a curve, continuity and differentiability, limit and derivative, derivative of products and composite functions, Leibnitz rule and chain rule.

UNIT – II
Expansion of function by Maclaurin's theorem, Taylor's theorem, Partial differentiation, Total differentiation coefficient, Homogeneous function, Euler theorem.

UNIT – III
Integral as anti – derivative, integration by parts, change of variable, integration of rational and irrational functions, definite integral, definite integral as a limit of a sum, application of definite integral to find sum of infinite series.

UNIT – IV
Differential Equation: Solution of ordinary differentiation equations, solution of first order and first degree differential equation, first order and higher degree differential equation, Linear differential equation of second order.

UNIT – V
Matrix: Solutions of system of Linear equation using matrix method, Rank of Matrix, Consistency of the linear system, Eigen value and Eigen vectors.

TEXT & REFF. BOOKS –
- Engg Mathematics – S.S. Sastry
- A Text book of differential Calculus – Gorakh Prasad
- A Text book of Integral Calculus – Gorakh Prasad

2BCA5–PRINCIPLES OF MANAGEMENT

UNIT–I

- **Management basics** – What is management, the history of management, types of manager, manager qualities. Management responsibilities, management tasks and functions.

- **The business environment** – defining the organization, organization structure, the quality organization, organizational changes, Centralisation and Decentralisation, managing changes. Management obligations, social and professional responsibilities, government regulations.

UNIT–II

- **Strategy formulation** – the elements of strategy, the strategy formulation process, alliances and acquisitions, strategy formulation tools and techniques, plan implementation.

- **Decision making** – the nature of management decision, the decision making process, decision making techniques.

- **Information presentation and reporting** - Principle, Type of Reports, Presentation on Modes, Function reporting system, Information and its uses, Characteristics of information, flow of information.

UNIT–III

- Management information system (MIS) and its uses, Computer based MIS – Advantages & Disadvantages.

- Brief introduction to project planning and management and its tools/techniques- Gantt chart, PERT/CPM.

- Human Resources management: Concepts & functions, Job analysis and role description.

UNIT–IV
Management skills

- Leadership and motivation – The nature of leadership, leadership theories, delegation, motivation and motivation theories, need of motivation, motivation techniques.

- Team building – Defining and effective team, selecting team members, building teams, training and development.

- Effective communication – The communication process, presentation skills. Tools and techniques.

UNIT–V

- **Time management –** The importance of time, characteristics of management tasks, determining time elements, time management techniques.

- **Entrepreneurship –** Entrepreneur and its role, how to become an entrepreneur, essentials steps to become an entrepreneur, EDP training.

TEXT & REFERENCE BOOKS :

- S.K.Basandra, "Computers Today", Galgotia Publications

- Mazda, Engineering Management, Addisen Wesley

- Koontz H, "Essentials Of Management", TMH Publications.

3BCA1-DATA STRUCTURES USING C/C++

Note: Implementation shall be done of the following data structures using C/C++

UNIT–I
The concept of data structure, Abstract data type, Concept of list & array Introduction to stack, Stack as an abstract data type, primitive operation on stack, Stacks application: Infix, post fix, Prefix and Recursion, Multiple Stack.

Introduction to queues, Primitive Operations on the Queues, Queue as an abstract data type, Circular queue, Dequeue, Priority queue, Applications of queue

UNIT–II
Introduction to the Linked List , Basic operations on linked list, Stacks and queues linked list, Header nodes, Doubly Linked List, Circular Linked List, Stacks & Queues as a Circular Linked List, Application of Linked List.

UNIT–III
TREES - Basic Terminology, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree, Traversal of binary trees:- In order, Preorder & post order, Application of Binary tree, Threaded binary tree, B-tree & Height balanced tree, Binary tree representation of trees.

UNIT–IV
Analysis of algorithm, complexity using big 'O' notation. Searching: linear search, Binary search, their comparison.

Sorting :Insertion sort, Selection sort, Quick sort, Bubble sort, Heap sort, Comparison of sorting methods.

Hash Table, Collision resolution Techniques.

UNIT–V
Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, Graph Traversal-Depth first & Breadth first search. Spanning Trees, minimum spanning Tree, Shortest path algorithm.

TEXT & REFERENCE BOOKS
- Fundamentals Of Data Structure, By S. Sawhney & E. Horowitz
- Data Structure : By Trembley & Sorrenson
- Data Structure : By lipschuists (Schaum's Outline Series Mcgraw Hill Publication)
- Fundamentals Of Computer Algorithm: By Ellis Horowitz and Sartaj Sawhney

3BCA2 - INTERNET & WEB DEVLOPMENT

UNIT–I
- **Internet**: Evolution, Concepts, Internet Vs Intranet, Growth of Internet, ISP, ISP in India, Types of connectivity - Dial-up, Leased line, DSL, Broadband, RF, VSAT etc., Methods of sharing of Internet connection, Use of Proxy server.

- **Internet Services** – USENET, GOPHER, WAIS, ARCHIE and VERONICA, IRC

- **WORLD WIDE WEB (WWW)** - History, Working, Web Browsers, Its functions, URLs, web sites, Domain names, Portals. Concept of Search Engines, Search engines types, searching the Web, Web Servers, TCP/IP and others main protocols used on the Web.

- **E-Mail:** Concepts, POP and WEB Based E-mail, merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free E-mail services, e-mail servers and e-mail clients programs.

UNIT–II
- Concepts of Hypertext, HTML introduction, features, uses & versions Using various HTML tags, Elements of HTML syntax, Head & Body Sections, , Inserting texts, Text alignment, Using images in pages, Hyperlinks – text and images, bookmarks, Backgrounds and Color controls, creating and using Tables in HTML, and presentation, Use of font size & Attributes, List types and its tags.

- Cascading Style sheets – defining and using simple CSS.

UNIT-III
- Introduction to WYSIWYG Design tools for HTML, Overview of MS FrontPage, Macromedia Dream weaver, and other popular HTML editors, designing web sites using MS FrontPage (using at least FrontPage 2000)

- Use of Frames and Forms in web pages, Image editors, Issues in Web site creations & Maintenance,

- Web Hosting and publishing Concepts, Hosting considerations, Choosing Web servers – Linux Vs Windows Web servers, Choosing Domain names, Domain name Registration, Obtaining space on Server for Web site,

- FTP software for upload web site. Add your website on search engines.

UNIT–IV
- JavaScript Overview, JavaScript and the WWW, JavaScript vs. VBScript, JavaScript vs. Java, JavaScript versions, Script element,.

- **Functions:** Functions introduction, Calling functions, JavaScript Comments, Variables: Variables overview, declaring variables, Types of variables, Casting variables, Alert box , Prompt & confirm.

- **Expressions:** Arithmetic operators, Assignment operators, Logical operators, Expressions and precedence, Statements: If statement, For statement, While statement, Break/Continue

- Creating arrays/event handlers, JavaScript Object model, Object and Events in JavaScript – OnClick, On MouseOver, On Focus, OnChange, OnLoad etc. Getting data with forms.

UNIT–V
- E - Commerce An introductions, Concepts, Advantages and disadvantages, Technology in E- Commerce, Internet & E-business, Applications, Feasibility & various constraints. E-transition challenges for Indian corporate, the Information Technology Act 2000 and its highlights related to e-commerce.

- Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risk and Electronic Payment Systems.

- E-security – Security on the internet, network and web site risks for e-business, use of firewalls, secure physical infrastructure.

TEXT & REFERENCE BOOKS :
- Frontiers of Electronic Commerce, By- Kalakota, Ravi ; Stone, Tom ; Whinston, Andrew B, Addison Wesley Publishing Co , ISBN 8178080575

- E-Commerce An Indian Perspective (Second Edition) – by P.T. Joseph, S.J. Prentice-Hall of India

- Internet & Web Design By A. Mansoor, Pragya Publications.

- Learn HTML in a weekend by Steven E. Callihan, PHI

- Using HTML By Lee Anne Phillips, PHI

- SAMS Teach Yourself Javascript in 24 Hrs. By Michael Moncur, TechMedia

3BCA3-OPERATING SYSTEM

UNIT–I
Definitions, functions and types of operating system, System components, Operating system Services, System Calls, System programs, System structure.

UNIT–II
Process Concepts, process state & process control block, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling Real-Time Scheduling, Threads, Threads in Linux.

UNIT–III
Critical Section Problem , Semaphores, Classical Problem Of Synchronization, , Deadlock Characterizations, Method for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Process Scheduling in Linux.

UNIT–IV
Logical versus physical address space, Swapping, Contiguous Allocating, Paging, Segmentation, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement, Page Replacement Algorithms, Memory Management in Linux.

UNIT–V
Disk Scheduling, Disk Management, Swap Space Management, Disk reliability, Stable Storage Implementation.

File Concepts Directory structure, Protection, File system in Linux.

TEXT & REFERENCE BOOKS :-
- Operating System Concepts by Silberschatz & Galvin, Addison Wesley Publication 6th Edition.
- Operating System Concepts & Design by Milan Milen Kovic, TMH Publication

3BCA4 – NUMERICAL METHODS

UNIT –1
Representation of a computer on a computer, difference between floating point and real arithmetic, different types of errors, Error in the approximation of a function, Error in series approximation.

UNIT-2
Solution of algebraic and trancendental equation using bisection method, regular false method, Newton raphson method.

Solution of simultaneous linear equations using gaussblimination method, jacobi' siterative method, gaussseidel iterative method.

UNIT-3
Interpoiation: finite difference and operators, Newton forward, Newton backward, games forward, games backward, stirling' sinterpolation divided difference formula

UNIT-4
Numerical differentiation , formula for derivatives maxima and minima of a tabulated

Numerical integration: Newton-cotes formula, trapezoidal rule, Simpson's rule, Weddle's rule.

UNIT-5
Solution of ordinary differential equation using Picard's method, taylor' series method, Euler's method, modified Euler's method, runge_knutta method, predictor-corrector method.

TEXT & REFF. BOOK
1. Numerical methods in engg & science –b.s.grawal

2. Numerical method –s.s sastry

3BCA5–MULTIMEDIA TOOLS AND APPLICATIONS

UNIT–I
Multimedia: Needs and areas of use, Development platforms for multimedia – DOS, Windows, Linux. Identifying Multimedia elements – Text, Images, Sound, Animation and Video, Making simple multimedia with PowerPoint.

Text – Concepts of plain & formatted text, RTF & HTML texts, using common text preparation tools, Conversion to and from of various text formats, using standard software, Object Linking and Embedding concept, Basics of font design, overview of some fonts editing and designing tools, Understanding & using various text effects.

Images – importance of graphics in multimedia, Vector and Raster graphics, image capturing methods – scanner, digital camera etc. various attributes of Images – size, color, depth etc, Various Image file format – BMP, DIB, EPS, CIF, PEX, PIC, JPG, TGA, PNG and TIF format – their features and limitations, graphic file formats conversions, processing images with common software tools such as Photoshop, Paint Shop pro, Corel draw etc..

UNIT-II
Sound: Sound and it Attributes, Mono V/s Stereo sound, Sound channels, Sound and its effect in multimedia, Analog V/s Digital sound, Basics of digital sounds-Sampling, Frequency, Sound Depth, Channels, Sound on PC, Sound standards on PC, Capturing and Editing sound on PC, Overview and using some sound recording, editing software. Overview of various sound file formats on PC – WAV, MP3, MP4, Ogg Vorbose etc.

UNIT–II
Animation: Basics of animation, Principle and use of animation in multimedia, Effect of resolutions, pixel depth, Images size on quality and storage. Overview of 2-D and 3-D animation techniques and software- animation pro, 3D studio & Paint Shop pro animator.

Animation on the Web – features and limitations, creating simple animations for the Web using GIF Animator and Flash.

UNIT–III
Video: Basics of Video – Analog and Digital Video, How to use video on PC. Introduction to graphics accelerator cards, DirectX Introduction to AV/DV and IEEE1394 cards , Digitization of analog video to digital video, Interlacing and non-interlacing, Brief note on various video standards – NTSC, PAL, SECAM, HDTV, Introduction to video capturing Media & instrument – Videodisk, DVCAM, Camcorder, Introduction to digital video compression techniques and various file formats – AVI, MPEG, MOVE Real Video.

Brief Introduction to video editing and movie making tools – Quick time, video for windows & Adobe premier.

UNIT–IV
Authoring tools for CD Based Multimedia: Type of multimedia authoring tools, key factors of selecting CD based multimedia authoring tools, Planning and distribution of a multimedia project. Multimedia development team & skills requirement, Stages in

designing & producing multimedia products for CD, Testing of product, distribution of multimedia product, various formats of CD's and DVD's.

UNIT – V
Multimedia on the Web: Bandwidth relationship, broadband technologies, Text in the web – Dynamic and embedded font technology, Audio on the Web – Real Audio and MP3/MP4, Audio support in HTML, Graphics – HTML safe color palate, Interlaced V/s Non interlaced model, Graphics support in HTML, Image Map, Video on the Web – Streaming video, Real Video, MPEG and SMIL, Virtual Reality on the Web.

TEXT AND REFERENCE BOOKS :
- Multimedia: Making It Work (4th Edition) – by Tay Vaughan, Tata Mcgraw Hills.

- Multimedia In Action – James E Shuman – Vikas Publishing House.

- Multimedi Basics – Volume – 1 Technology, Andreas Holzinger, Firewall Media(Laxmi Publications Pvt. Ltd) New Delhi.

4BCA1- INFORMATION SYSTEMS : ANALYSIS AND DESIGN

UNIT-I
- System Concept: Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system, man-made information systems.

- System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success.

- System Planning: Base for planning a system, Dimensions of Planning.

UNIT-II
- Initial Investigation: Determining users requirements and analysis, fact finding process and techniques.

- Feasibility study: Determination of feasibility study, Technical, Operational & Economic Feasibilities, System performance constraints, and identification of system objectives, feasibility report.

- Cost/Benefit Analysis: Data analysis, cost and benefit analysis of a new system. Categories determination and system proposal.

UNIT-III
- Tools of structured Analysis: Logical and Physical models, context, diagram, data dictionary, data diagram, form driven methodology, IPO and HIPO charts, Gantt charts, system model, pseudo codes, Flow charts- system flow chart, run flow charts etc., decision tree, decision tables, data validation,

- Input/ Output and Form Design: Input and output form design methodologies, menu, screen design, layout consideration.

UNIT-IV
- Management standards – Systems analysis standards, Programming standards, Operating standards.

- Documentation standards – User Manual, system development manual, programming manual, programming specifications, operator manual.

- System testing & quality: System testing and quality assurance, steps in system implementation and software maintenance.

- System security: Data Security, Disaster/ recovery and ethics in system development, threat and risk analysis.

- System audit.

UNIT-V
- Organization of EDP: Introduction. Job Responsibilities & duties of EDP Personnels- EDP manager, System Analyst, Programmers, Operators etc. Essential features in EDP Organization. Selection of Data Processing Resources: purchase, lease, rent-advantages and disadvantages.

- Hardware and software procurement – In-house purchase v/s hiring and lease.

Text & Reference Books:
- System Analysis & Design by V K Jain, Dreamtech Press

- Modern System Analysis &Design by A Hoffer, F George, S Valaciah Low Priced Edn. Pearson Education.

- Information Technology & Computer Applications, by V.K.Kapoor, Sultan Chand & Sons, New Delhi.

4BCA2 – RDBMS USING ORACLE

UNIT - I

Oracle product details, Different Data base model , RDBMS components – Kernel, Data dictionary, Client/Server Computing and Oracle, Overview of oracle architecture – Oracle files, System and User process, Oracle Memory, System data base object, Protecting data

UNIT - II

Oracle data types, Working with Tables. Data Constraints, Column level & table Level Constraints.

Defining different constraints on the table Defining Integrity Constraints in the ALTER TABLE Command. Select Command, Logical Operator, Range Searching, Pattern Matching, Oracle Function, Grouping data from Tables in SQL, Manipulation Data in SQL

Joining Multiple Tables (Equi Joins),Joining a Table to itself (self Joins), Sub queries Union, intersect & Minus Clause, Creating view, Renaming the Column of a view, Granting Permissions, - Updation, Selection, Destroying view

UNIT-III

Creating Indexes. Creating and managing User, PL/SQL, SQL & PL/SQL differences, block structure, variables, constants, data type, Assigning database values to variables, Select … INTO, Using cursors

UNIT-IV

Error handling, Built-in exceptions, User defined exceptions, The Raise-Application-error procedure, Oracle transaction, Locks, Implicit and Explicit locking. Procedures & Functions - Concept, creation, execution, advantages, syntax, deletion.

UNIT-V

Triggers - Concept, use, how to apply database triggers, type of triggers, syntax, deleting.

Functions of Oracle DBA.

Create Database, Create table space.

Import & Export

Oracle backup & recovery

TEXT & REFERENCE BOOKS :

Ivan Bayross, "SQL, PL/SQL", Bpb Publications"

Liebschuty, "The Oracle Cook Book", BPB Publication

Michael Abbey, Michael J.Corey, "Oracle A Beginners Guide". TMH Publication

Oracle Unleashed (Chapter 1,2,3,4,5 and 9)

4BCA3–PROGRAMMING WITH VISUAL BASIC.NET

(THE SYLLABUS IS BASED ON THE VISUAL STUDIO 2008)

UNIT–I
- Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser.

- The environment: Editor tab, format tab, general tab, docking tab. visual development & event drive Programming -Methods and events.

UNIT–II
- The VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function.

- Control flow statements: conditional statement, loop statement. Msgbox & Inputbox.

UNIT – III
- Working with Forms : Loading, showing and hiding forms, controlling One form within another.

- GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar.There Properties, Methods and events. OpenFileDilog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label.

- Designing menues : ContextMenu, access & shorcut keys.

UNIT–IV
- Object oriented Programming: Classes & objects, fields Properties, Methods & Events, constructor, inheritance. Access Specifiers: Public Private, Projected. Overloading, My Base & My class keywords.

- Overview of OLE, Accessing the WIN32 API from VB.NET & Interfacing with MS office, COM technology, advantages of COM+, COM & .NET, Create User control, register User Control, access com components in .net application.

UNIT–V
- Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid.

- Generate Reports Using CrystalReportViwer.

TEXT & REFERENCE BOOKS :

- VB.NET Programming Black Book by steven holzner –dreamtech publications

- Mastering VB.NET by Evangelos petroutsos- BPB publications

- Introduction to .NET framework-Worx publication

- msdn.microsoft.com/net/

- www.gotdotnet.com

4BCA4 - COMPUTER NETWORKS

UNIT-I
- Networking - Needs and Advantages, Network, Types- Client, Server and Peers, introduction to various types of servers.
- Transmission technology - Signal Transmission-Digital signaling, Analog Signaling, Asynchronous & synchronous Transmission, Wired & Wireless transmission, Base band and Broadband transmission,
- Transmission Media types- properties & specialty of various media – types, comparative study.
- Network Topology-Bus, Star, Ring, Star bus, Star ring, Mesh – Features, Advantages and disadvantages of each type.

UNIT–II
- Network adapters – working principals, configuration and selection,
- Network Protocols-Hardware Protocols, software Protocols.
- The theoretical Network Model - OSI
- IEEE 802 standards, 802.3, 802.4, 802.5
- Real World Networks – Ethernet, Fast Ethernet, Token Rings, FDDI, ATM, ARCnet and AppleTalk.

UNIT–III
- Network Scaling-No. of nodes, distance, software, speed, special requirements
- Connectivity Devices: Modem, Repeater, Hub – Active, Passive and Intelligent, Bridge-Local, Remote, Wireless, Routers-Static and Dynamic, Switches and its types . Brouters and Gateways.
- Overview of TCP/IP reference model.
- TCP/IP Protocol suites – Comparision between OSI and TCP/IP Models, Classification of TCP/IP protocols- IP, TCP, UDP, ARP, ICMP.
- TCP/IP Services Protocols- DHCP, DNS, WINS, FTP, SMTP, TELNET, NFS.
- IP Addressing and Subnet- IP Address – Class A, B & C. Domain Name Addressing, URL, e-mail address, Subnet & subnet mask.

UNIT–IV
- Network building blocks requires for setting up a small LAN using Windows in a office, Hardware & software required, Simple Installation and configuration of Networking under Windows.
- Using HyperTerminal in Windows, overview and using Network Setup Wizard in Windows, Some basic networking configuration using Windows 95/98/XP/2000/2003 Server and clients, Simple network administration. Setting up Internet Connection Sharing in Windows.

UNIT- V

- Network Security : Network security issues, common threats, security barriers in the network pathways, Official levels of computer security, types of security controls, approaches to network security, Ethical hacking.

- Firewalls – Need and features of firewalls, types of firewall technology- network level and application level, IP packets filter screening routers, limitations of firewalls.

- Encryption and Decryption – Cryptography, Type of encryptions, encryption keys, single/ secrete/ private key encryption, Public/Private key encryption.

- Overview of Digital Signature and Digital Certificates technology,

TEXT & REFERENCE BOOKS :

- James Chellis Charles Perkins, Matthew Strebe "Networking Essentials:Study Guide MCSE", Second Edition, BPB Publications.

- S.K.Basandra & S. Jaiswal, "Local Area Networks", Galgotia Publications

- MCSE Windows 2000 Network Infrastructure Disign

- Andrew & Tanenbaum, "Computer Network "

- William Stallings, "Data and Computer Communication"

- Prakash C Gupta, "Data Communication

4BCA5 - MATHEMATICAL STATISTICS

UNIT-1
Frequency distributions, Histograms and frequency polygons , Measures of central tendency : Mean, Mode, Median, Dispersion, Mean deviation and standard deviation.

UNIT-2
Moments, Skewness, kurtosis, Elementary probability theory: Definition, conditional probability, Probability distribution, mathematical expectation

UNIT –3
Theoretical distribution:

Binomial , poisson and Normal distribution , Relation between the binomial, poisoned Normal distribution.

Correlation and regression, liner correlation, measure of correlation, least square regression lines.

UNIT 4
Curve fitting: Method of least square, least square line, least squares Parabola. chi-**square text :** definition of chi-square, signification test : contingency test, coefficient of contingency

UNIT-5
Basic of sampling theory: Sample mean and variance, students t-test, test of Hypotheses and significance, degree of freedom, Z-test, small and large sampling, Introduction to monte carlo method.

TEXT AND REFERENCE BOOK
- Mathematical statistics: J.N .Kapoor and H.C. Saxena
- Mathematical statistics: M.Ray and H. Sharma

4BCA8 – PROFESSIONAL PERSONALITY DEVELOPMENT- I

UNIT 1:
PERSONALITY PROJECTION

- Leadership Skill Development
- Team building skill
- Interpersonal Dynamics
- Attitude Building
- Optimism
- General Awareness

UNIT 2:
BASIC QUALITIES OF EFFECTIVE PEOPLE

- (Reference : Seven habits for Highly effective people by Stefen Covey, Seven habits for Teenagers by Stefen Covey)
- Being Proactive
- Beginning with End in Mind
- Putting First Things First

TECHNIQUES OF HIGHLY EFFECTIVE PEOPLE

- (Reference : Seven habits for Highly effective people by Stefen Covey)
- Win Win Strategy
- Understanding before getting Understood
- Synergizing

UNIT 3
NON-VERBAL COMMUNICATION

- Importance of Body Language
- Appropriate Body Postures
- Expression for Impression
- Professional Gestures

UNIT 4
PROFESSIONAL WRITING

- Letter Drafting & Report Writing
- Preparation of CV, Resume & Bio-data

UNIT 5
APTITUDE DEVELOPMENT

- Improving Mathematical Acumen
- Enhancing Logical & Analytical Reasoning
- Verbal & Non-verbal ability

5BCA1-SOFTWARE TESTING AND PROJECT MANAGEMENT

UNIT - I
- **Testing basics and Development Models**: Principals and context of testing in software production, Usability and Accessibility Testing, Phases of Software Project, Process models to represents different phases, Software Quality Control and its relation with testing, validating and verification, Software Development life cycle models, various development models.

- **White Box Testing**: White Box Testing - Static Testing, Structural Testing-Unit code functional testing, Code coverage testing, code complexity testing,.

- **Black Box Testing:** What? Why and when to do Black box testing, Requirements based testing, Positive and Negative Testing, Boundary value testing, Decision Tables, Equivalence Partitioning, State Based or Graph Based Testing, Compatibility Testing, User Documentation Testing, Domain Testing.

UNIT - II
- **Integration Testing**: Introduction and types of integration testing, Scenario testing, defect bash.

- **System and Acceptance Testing**- Overview, functional and non-functional testing, Acceptance testing.

- **Overview of some software testing tools**: WinRunner, LoadRunner, Test Director.

- (Some practical should be conducted using these tools)

UNIT - III
- **Performance Testing**- Introduction, factors related to performance testing, methodology for performing testing, Regression Testing,

- **Ad hoc Testing**- Overview, Buddy & pair testing, Exploratory testing, Interactive testing, Agile and extreme testing.

- **Testing of Object Oriented Testing** – Introduction, Differences in OO testing.

UNIT-IV
- **Software Project Management:** Overview, Software Project Management Framework, Software Development life cycle,

- **Organization Issues and Project Management**, Managing Processes, Project Execution, Problems in Software Projects, Project Management Myths and its clarifications.

- **Software Project Scope**: Need to scope a software project, scope management process, communication techniques and tools, communication methodology

- **Software Requirement Gathering and Resource allocation**: Requirement specifications, SRS Document preparation, Resources types for a software projects, requirement for resources allocation.

UNIT – V

- **Software Project Estimation**: Work Breakdown structure (WBS), steps in WBS, Measuring efforts for a project, techniques for estimation – SLOC, FP, COCOMO and Delphi methods.

- **Project Scheduling:** Scheduling and its need, scheduling basics, Gannt Chart, Network scheduling techniques, Pert and CPM

- **Using a Project Management Tool:** Introduction to MS Project 2000, Managing tasks in MS Project 2000, Tracing a project plan, creating and displaying project information reports.

TEXT & REFERENCE BOOK :

- Software Testing: Principles and Practice By Gopalaswamy and Srinivasan, 817758121x. Publisher, Pearson Education India. ISBN, 817758121x.

- Software Testing Tools: Covering WinRunner, Silk Test, LoadRunner, JMeter and TestDirector with case By Dr. K.V.K.K. Prasad, ISBN: 8177225324, Wiley Dreamtech, List Price: Rs. 279.00

- http://www.columbia.edu/~jm2217/

- Basics of Software Project Management – By NIIT,, Prentice Hall of India, ISBN 81-203-2490-0

- Software Project Management by Bob Hughes & mike Cotterell, Tata McGraw Hill , ISBN – 0-07-061985-9

5BCA2 – PROGRAMMING WITH JAVA

UNIT–I
- C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment.
- JAVA program structure, Tokens, Statements, JAVA virtual machine, Constant & Variables, Data Types, Declaration of Variables, Scope of Variables, Symbolic Constants, Type Casting.
- Operators : Arithmetic, Relational, Logical Assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions & its evaluation.
- If statement, if…else… statement, Nesting of if…else… statements, else…if Ladder, Switch, ? operators, Loops – While, Do, For, Jumps in Loops, Labelled Loops.

UNIT–II
- Defining a Class, Adding Variables and Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods.
- Inheritance: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract methods and Classes, Visibility Control.

UNIT–III
- Arrays: One Dimensional & two Dimensional, strings, Vectors, wrapper Classes, Defining Interface Extending Interface, Implementing Interface, Accessing Interface Variable, System Packages, Using System Package, Adding a Class to a Package, Hiding Classes.

UNIT–IV
- Creating Threads, Extending the Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the Runnable Interface.

UNIT–V
- Local and Remote 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 the Display, HTML Tags & Applets, Getting Input from the User.

TEXT & REFERENCE BOOKS:
- E. Balaguruswamy, "Programming In Java", 2nd Edition, TMH Publications ISBN 0-07-463542-5
- Peter Norton, "Peter Norton Guide To Java Programming", Techmedia Publications ISBN 81-87105-61-5

5BCA3 - ASP.NET AND C#

UNIT – I

- Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications

- Web servers, installation of IIS.

- Web forms, web form controls -server controls, client controls, web forms & HTML, Adding controls to a web form ,Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box, etc.

- Running a web Application, creating a multiform web project.

UNIT-II

- Form Validation: Client side validation, server Side validation, Validation Controls : Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control.

- State management- View state, Session state, Application state,

UNIT-III

- Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, DataAdapter Class, Dataset Class. Display data on data bound Controls and Data Grid.

- Database Accessing on web applications: Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls.

UNIT-IV

- Writing datasets to XML, Reading datasets with XML.

- Web services: Introduction, Remote method call using XML, SOAP, web service description language, building & consuming a web service, Web Application deployment.

UNIT-V

- Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program.

- Language features: Type system, boxing and unboxing, flow controls, classes, interfaces, Serialization, Delegates, Reflection.

TEXT BOOKS & REFERENCE BOOKS

- VB.NET Black Book by steven holzner –dreamtech

- ASP.NET Unleashed

- C# programming – wrox publication

- C# programming Black Book by Matt telles

5BCA4 – LINUX & SHELL PROGRAMMING

UNIT – I

- **Linux introduction** : Basic Features, Different flavors of Linux. Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories.

- **Installation of Linux system**: Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process, init and run levels.

- **Essential Linux commands** Understanding shells, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces.

UNIT–II

- Processes in Linux-process fundamentals, connecting processes with pipes, tee, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron, batch commands, kill, ps, who, sleep, Printing commands, find, sort, touch, file, file related commands-ws, sat, cut, dd, etc. Mathematical commands- bc, expr, factor, units.

- Creating and editing files with vi, joe & vim editor

UNIT–III

- Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Flter using regular expressions – grep, egrep, and sed.

- awk programming – report printing with awk.

UNIT–IV

- System administration Common administrative tasks, identifying administrative files – configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, checking and monitoring system performance file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel. Backup and restore files, reconfiguration hardware with kudzu, installaing and removing packages in Linux. Configure X-windows starting & using X desktop. KDE & Gnome graphical interfaces, changing X windows settings.

UNIT-V

- Installation, configuration and managing a simple LAN within an organization using Linux.

- Setting up and using telnet server and clients.

- Installation and simple configuration of Proxy Server - Squid, Mail server – Sendmail, Web server - Apache, File server and Samba server in linux

- VNC server and client setting

TEXTS & REFERENCES BOOKS :

- UNIX – Concepts & Applications (Third Ed.) – Sumitabha Das, Tata McGraw Hill Publications.

- Unix for programmers and users (Third Ed.) – Graham Glass & King Ables, Pearson Education India. (Low Prices Edition).

- Fedora Core 6 Bible

5BCA5 – ENTREPRENEURSHIP DEVELOPMENT & ENVIRONMENT STUDIES

PART I - ENTREPRENEURSHIP DEVELOPMENT

Unit I :
- **Entrepreneurship-** Meaning, Concept, Characteristics of entrepreneur.

Unit II:

Types of entrepreneurship, importance and views of various thinkers (Scholars) .
- Formation of goals, How to achieve goals.

- Problems in achieving targets and solution.

- Self motivation, elements of self motivation and development.

- Views of various scholars, evaluation, solutions.

- Leadership capacity: Its development and results.

Unit III :
- Projects and various organizations (Govt., non-Govt.), Govt. Projects, Non-Govt. projects.

- Contribution of Books, their limitations, scope.

Unit IV :
- Functions, qualities, management of a good entrepreneur.

- Qualities of the entrepreneur (Modern and traditional).

- Management skills of the entrepreneur.

- Motive factors of the entrepreneur.

Unit V:
Problems and Scope of the Entrepreneur :

- Problem of Capital

- Problem of Power

- Problem of registration

- Administrative problems

- Problems of Ownership.

PART II - ENVIRONMENT STUDIES

Unit – I
The Multi disciplinary nature of environmental studies Definition. Scope and importance Need for public awareness Natural Resources

Unit – II

- **Renewable and nonrenewable resources :** Natural resources and associated Problems.
  a) Forest resources Use and overexploitation, deforestation, case studies Timber extraction, mining, dams and their effects on forests and tribal people.
  b) Water resources Use and overutilization of surface and ground water floods, drought, conflicts over water , dams benefits and problems.
  c) Mineral resources : Use and exploitation, environmental effects of extracting and Using mineral resources, cases studies.
  d) Food resources : World food problems, changes caused by agriculture and overgrazing, effect of modern agriculture, fertilizer pesticide problems water logging, salinity, case studies.
  e) Energy resources Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources Case studies.
  f) Land resource : Land as a resource, land degradation, man induced landslides, soil erosion and desertification. .
- **Role of an individual in conservation of natural resources.**
- **Equitable use of resources for sustainable lifestyles.**

Unit – III
Ecosystems:

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystem:
  a) Forest ecosystem
  b) Grassland ecosystem
  c) Desert ecosystem
  d) Aquatic ecosystem(ponds, streams, lakes, rivers, oceans, estuaries.

Unit – IV
Biodiversity and its conservation:

- Introduction Definition :genetic, species and ecosystem diversity.
- Biogeographically classification of India.
- Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a megadiversity nation.
- Hotspots of biodiversity.
- Threats to biodiversity : habital loss, poaching of wildlife, man wildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity : isitu and Exsitu conservation of biodiversity.

Unit – V

- Environmental Pollution Definition Causes, effects and control measures of :
  a) Air pollution
  b) Water pollution
  c) Soil pollution
  d) Marine pollution
  e) Noise pollution
  f) Thermal pollution
  g) Nuclear hazards
- Solid waste Management Causes, effects and control measure of urban and industrial wastes.
- Role of an individuation prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

Unit – VI
Social Issues and the Environment:

- From unsustainable to Sustainable development
- Urban problem related to energy.
- Water conservation, rain water harvesting/watershed management
- Resettlement and rehabilitation of people, its problem and concerns. Case studies.
- Environmental ethics. Issues & possible solution.
- Climate change, global warming

- Acid rain

- Ozone layer depletion.

- Nuclear accidents and holocaustcase studies.

- Wasteland reclamation.

- Consumerism and waste products.

- Environment protection Act.

- Air (Prevention and control of pollution) Act.

- Wildlife protection Act.

- Forest Conservation Act. Issues involved in enforcement of environmental legislation, public Awareness.

Unit – VII
Human population and the environment:

- Population growth, variation among nations.

- Population explosion Family Welfare Programmer.

- Environment and human health.

- Human Rights

- Value Education

- HIV/AIDS

- Women and child welfare

- Role of information Technology Welfare Environment and human health.

5BCA8 – PROFESSIONAL PERSONALITY DEVELOPMENT- II

UNIT -I

COMMUNICATION EFFECTIVENESS:
- Fluency Enhancement
- Removal of barriers to communication
- Group Discussion
- Role Play
- Anchoring
- Voice Modulation Management

UNIT -II

CURRENT AFFAIRS & GENERAL AWARENESS:
- Fusion of Management, Technology & ICT

ESSENTIAL QUALITIES FOR SUCCESS:
(reference : The Seven Spiritual Laws of Success by Deepak Chopra)
- Efforts
- Willingness
- Spirituality

PRESENTATION SKILLS:
- Techniques of Presentation
- Methods of preparing Presentation
- Removal of stage fear
- Tools of Presentation (Transparencies, Slides & Audio-Visual Tools)
- Project work

UNIT – III

GROUP DYNAMICS:
- Concepts of Group Discussion
- Types of Group Discussion
- Etiquettes in Group Discussion
- Understanding Group Tasks
- Mock Group Discussions
- Leadership Skills
- Creative Brainstormins.

UNIT – IV

PROBLEM SOLVING TECHNIQUES:
- Case Studies & Analysis
- Case Discussion & Presentation
- Decision Making Skills
- Principles of solving Dilemmas

PROFESSIONALISM:
- Understanding Professionalism
- Professional Etiquettes
- Relationship Management
- Professional Communication

UNIT – 5

COMPREHENSIVE COMMUNICATION:
- Concept and Process of Communication
- Type of Communication
- Barriers of Communications
- Importance of Listening
- Role Play
- Presentation of Self, Goals & Achievements
- English Communication Practice

INTERVIEW TECHNIQUES:
- Personal (HR & Technical) Interview Techniques
- Frequently Asked Questions
- Psychometric Analysis
- Mock Interview Sessions