BACHELOR OF COMPUTER APPLICATIONS
SCHEME OF EXAMINATION – FIRST YEAR(w.e.f. 2011-12)

Paper No.	Title of Paper	External Marks	Internal Assessment	Maximum Marks	Exam Duration
Semester - I					
BCA-111	Computer & Programming Fundamentals	80	20	100	3hrs
BCA-112	PC Software	80	20	100	3hrs
BCA-113	Computer-Oriented Numerical Methods	80	20	100	3hrs
BCA-114	Logical Organization of Computer – I	80	20	100	3hrs
BCA-115	Mathematical Foundations – I	80	20	100	3hrs
BCA-116	Communication Skills	80	20	100	3hrs
BCA-117	Lab – I Windows, and Power Point			100	3hrs
BCA-118	Lab – II Word, and Excel			100	3hrs
Semester - II					
BCA-121	'C' Programming – I	80	20	100	3hrs
BCA-122	Logical Organization of Computer – II	80	20	100	3hrs
BCA-123	Computer-Oriented Statistical Methods	80	20	100	3hrs
BCA-124	Mathematical Foundations – II	80	20	100	3hrs
BCA-125	Accounting & Financial Management	80	20	100	3hrs
BCA-126	Personality Development	80	20	100	3hrs
BCA-127	Lab – I Programming in 'C'			100	3hrs
BCA-128	Lab – II Statistical Methods implementation in 'C'			100	3hrs

Internal assessment will be based on the following criteria:

(I)   Two Handwritten Assignments   :   10%
       (Ist Assignment after one month &
       IInd Assignment after two months)
(ii)   One Class Test   :   5%
       (one period duration)
(iii) Attendance   :   5%

       Marks for Attendence will be given as under:
          (1) 91% onwards   :   5 Marks
          (2) 81% to 90%   :   4 Marks
          (3) 75% to 80%   :   3 Marks
          (4) 70% to 75%   :   2 Marks*
          (5) 65% to 70%   :   1 Mark*

* For students engaged in co-curricular activities of the colleges only/authenticated medical grounds duly approved by the concerned Principal.

BACHELOR OF COMPUTER APPLICATIONS
SCHEME OF EXAMINATION – SECOND YEAR(w.e.f. 2012-13)

Paper No.	Title of Paper	External Marks	Internal Assessment	Maximum Marks	Exam Duration
Semester - III					
BCA-231	'C' Programming – II	80	20	100	3hrs
BCA-232	Data Structures – I	80	20	100	3hrs
BCA-233	Computer Architecture – I	80	20	100	3hrs
BCA-234	Introduction to Data Base System	80	20	100	3hrs
BCA-235	Structured System Analysis & Design	80	20	100	3hrs
BCA-236	Mathematical Foundations – III	80	20	100	3hrs
BCA-237	Lab – I Programming in 'C'			100	3hrs
BCA-238	Lab – II Implementation of Data Structure in 'C'			100	3hrs
Semester – IV					
BCA-241	Web Designing – I	80	20	100	3hrs
BCA-242	Data Structures – II	80	20	100	3hrs
BCA-243	Computer Architecture – II	80	20	100	3hrs
BCA-244	Relational Data Base Management System	80	20	100	3hrs
BCA-245	Management Information System	80	20	100	3hrs
BCA-246	Mathematical Foundations-IV	80	20	100	3hrs
BCA-247	Lab – I Web designing using HTML			100	3hrs
BCA-248	Lab – II ORACLE			100	3hrs

Internal assessment will be based on the following criteria:

(I)   Two Handwritten Assignments   :   10%
     (Ist Assignment after one month &
     IInd Assignment after two months)

(ii)   One Class Test   :   5%
     (one period duration)

(iii)   Attendence   :   5%

Marks for Attendence will be given as under:
1. 91% onwards   :   5 Marks
2. 81% to 90%   :   4 Marks
3. 75% to 80%   :   3 Marks
4. 70% to 75%   :   2 Marks*
5. 65% to 70%   :   1 Mark*

* For students engaged in co-curricular activities of the colleges only/authenticated medical grounds duly approved by the concerned Principal.

BACHELOR OF COMPUTER APPLICATIONS
SCHEME OF EXAMINATION – THIRD YEAR(w.e.f 2013-14)

Paper No.	Title of Paper	External Marks	Internal Assessment	Maximum Marks	Exam Duration
Semester - V					
BCA-351	Introduction to Object oriented Programming	80	20	100	3hrs
BCA-352	Operating Systems	80	20	100	3hrs
BCA-353	Software Engineering	80	20	100	3hrs
BCA-354	Computer Networks	80	20	100	3hrs
BCA-355	Computer Graphics	80	20	100	3hrs
BCA-356	Web Designing – II	80	20	100	3hrs
BCA-357	Lab – I Programming in 'C++			100	3hrs
BCA-358	Lab – II Web designing			100	3hrs
Semester - VI					
BCA-361	Programming in 'C++'	80	20	100	3hrs
BCA-362	Introduction to Linux	80	20	100	3hrs
BCA-363	Internet Technology	80	20	100	3hrs
BCA-364	Visual Basic	80	20	100	3hrs
BCA-365	Multimedia Technology	80	20	100	3hrs
BCA-366	Introduction to .NET	80	20	100	3hrs
BCA-367	Lab – I Linux and C++			100	3hrs
BCA-368	Lab – II Programming in VB			100	3hrs

Internal assessment will be based on the following criteria:

(I)   Two Handwritten Assignments   :   10%
        (Ist Assignment after one month &
        IInd Assignment after two months)

(ii)   One Class Test   :   5%
        (one period duration)

(iii)   Attendence   :   5%

        Marks for Attendence will be given as under:
        1. 91% onwards   :   5 Marks
        2. 81% to 90%   :   4 Marks
        3. 75% to 80%   :   3 Marks
        4. 70% to 75%   :   2 Marks*
        5. 65% to 70%   :   1 Mark*

* For students engaged in co-curricular activities of the colleges only/authenticated medical grounds duly approved by the concerned Principal.

BCA – 111   Computer & Programming Fundamentals

Maximum Marks: 100   **External: 80**
                                                             Internal: 20

Time: 3 hours

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.

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

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.
Techniques of Problem Solving: Flowcharting, algorithms, pseudo code, decision table, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.
Computer Languages: Analogy with natural language, machine language, assembly language, high-level language, compiler, interpreter, assembler, characteristics of a good programming language.

UNIT-IV

Searching, Sorting, and Merging: Linear & Binary Searching, Bubble, Selection, and Insertion Sorting, Merging.
Overview of Networking: An introduction to computer networking, Network types (LAN, WAN, MAN), Network topologies, introduction to internet and its uses.

TEXT BOOKS
1. Sinha, P.K. & Sinha, Priti, Computer Fundamentals, BPB
2. Dromey, R.G., How to Solve it By Computer, PHI

REFERENCE BOOKS
1. Balagurusamy E, Computing Fundamentals and C Programming, Tata McGraw Hill.
2. Norton, Peter, Introduction to Computer, McGraw-Hill
3. Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World
4. Rajaraman, V., Fundamentals of Computers, PHI
5. Ram, B., Computer Fundamentals, Architecture & Organization, New Age International (P) Ltd.

BCA-112   PC SOFTWARE

Maximum Marks: 100   **External: 80**
                                                                   Internal: 20

Time: 3 hours

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.

UNIT – I
MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance. Using windows accessories.

UNIT – II
Documentation Using MS-Word - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

UNIT – III
Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel-Sorting, Filtering, Table, Validation, Goal Seek, Scenario.

UNIT – IV
Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

TEXT BOOKS
1. Microsoft Office – Complete Reference – BPB Publication
2. Learn Microsoft Office – Russell A. Stultz – BPB Publication

REFERENCES BOOKS
1. Courter, G Marquis (1999). Microsoft Office 2000: Professional Edition. BPB.
2. Koers, D (2001). Microsoft Office XP Fast and Easy. PHI.
3. Nelson, S L and Kelly, J (2002). Office XP: The Complete Reference. Tata McGraw-Hill.

BCA-113   COMPUTER-ORIENTED NUMERICAL METHODS

Maximum Marks: 100   **External: 80**
                                                          Internal: 20

Time: 3 hours

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.

UNIT-I

Computer Arithmetic: Floating-point representation of numbers, arithmetic operations with normalized floating-point numbers and their consequences, significant figures.
Error in number representation-inherent error, truncation, absolute, relative, percentage and round-off error.
Iterative Methods: Bisection, False position, Newton-Raphson method. Iteration method, discussion of convergence, Bairstow's method.

UNIT-II

Solution of simultaneous linear equations and ordinary differential equations: Gauss-Elimination methods, pivoting, Ill-conditioned equations, refinement of solution. Gauss-Seidal iterative method, Euler method, Euler modified method, Taylor-series method, Runge-Kutta methods, Predictor-Corrector methods.

UNIT-III

Interpolation and Approximation:
Polynomial interpolation: Newton, Lagranges, Difference tables, Approximation of functions by Taylor Series.
Chebyshev polynomial: First kind, Second kind and their relations, Orthogonal properties.

UNIT-IV

Numerical Differentiation and integration: Differentiation formulae based on   polynomial fit, pitfalls in differentiation, Trapezoidal & Simpson Rules, Gaussian Quadrature.

REFERENCE BOOKS
1. V. Rajaraman, Computer Oriented Numerical Methods, Prentice Hall, India.
2. S. S. Sastry, Introductory Methods of Numerical Analysis.
3. M. K. Jain, S.R.K. Iyengar & R. K. Jain, Numerical Methods for Scientific and Engineering Computation.
4. H. C. Saxena, Finite Differences and Numerical Analysis.
5. Modes A., Numerical Analysis for Computer Science.

BCA-114   **LOGICAL ORGANIZATION OF COMPUTER-I**

Maximum Marks: 100   **External: 80**
                                                         Internal: 20

Time: 3 hours

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.

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.

TEXT 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.

REFERENCE BOOKS
1. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
2. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

BCA – 115   MATHEMATICAL FOUNDATIONS – I

Maximum Marks: 100   External: 80
                                                          Internal: 20

Time: 3 hours

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.

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
Epsilon and delta definition of the continuity of a function of a single variable, Basic properties of limits, Continuous functions and classifications of discontinuities, Derivative of a function, Derivatives of Logarithmic, exponential, trigonometric, inverse trigonometrical and hyperbolic functions. Higher order derivatives.

UNIT- III
Formation of differential equations order and degree of the differential equation, Geometrical approach to the existence of the solution of the differential equation $dy/dx=f(x,y)$. Ordinary differential equations of first degree and the first order, exact differential equations

UNIT- IV
Linear differential equations of higher order with constant coefficients, Homogeneous linear differential equations and linear differential equations reducible to homogenous differential equations, Applications of differential equations to geometry,

REFERENCE BOOKS
1.   D.A. Murray: Introductory course in differential equations, Orient Lengaman(India) 1967.
2.   H.T.H. Piaggio: Elementary Treatise on differential equation and their applications C.B.S. publishers of distributors.
3.   S.L. Ross : Ordinary differential equations
4.   Babu Ram: Discrete Mathematics
5.   Shanti Narayana : Differential & Integral calculus

BCA-116   COMMUNICATION SKILLS (ENGLISH)

Maximum Marks: 100   **External: 80**
                                                                       Internal: 20

Time: 3 hours

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.

UNIT- I
Q 1. One essay type question (with internal choice) from the prescribed text.
Q 2. Five short answer type questions (with internal choice) from the prescribed text.

UNIT-II
Q 3. A comprehension passage from the prescribed text book (Reflection) with five questions at the end.
Q 4. Faxes, e-mails, and text messages composing. This question will carry three parts A, B, and C with questions on all the three above mentioned items.

UNIT-III
Q 5. Grammar questions on the following items: (i) Articles (ii) Preposition (iii) Tenses (iv) Subject verb agreement (v) Voice (vi) Tag questions (vii) Reported speech (viii) Comparatives and superlatives
Q 6. A paragraph of about 150 words on any one of the given topics.

UNIT-IV
Q 7. Official letters / applications (With internal choice)
Q 8. English in situations (for example: greetings, in the post office, catching a train, at a bank, making a telephone call, buying vegetables, at the hospital, on the bus etc.

TEXT BOOKS
1. Reflections by I. P. Anand & Dr. R. K. Malhotra
2. Remedial English Grammar by F. T. Wood.

RECOMMENDED BOOKS:
1. Business Letter Writing by Jasmin S. and S. Bright, Universal, New Delhi, 1984.
2. English in Situations by R. O. Neil (OUP)

Maximum Marks: 100   **External: 80**
                                                             Internal: 20

Time: 3 hours

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.

UNIT-I
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, Input functions viz. scanf(), getch(), getche(), getchar(), gets(), output functions viz. printf(), putch(), putchar(), puts().

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

UNIT-III
Decision making & looping: For, while, and do-while loop, jumps in loops, break, continue statement.
Functions: Definition, prototype, passing parameters, recursion.

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

TEXT BOOKS
1. Gottfried, Byron S., Programming with C, Tata McGraw Hill
2. Balagurusamy, E., Programming in ANSI C, 4E, Tata McGraw-Hill

REFERENCE BOOKS
1. Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison Wesley.
2. Yashwant Kanetker, Let us C, BPB.
3. Rajaraman, V., Computer Programming in C, PHI.
4. Yashwant Kanetker, Working with C, BPB.

BCA-122   LOGICAL ORGANIZATION OF COMPUTER – II

Maximum Marks: 100   **External: 80**
                                                            Internal: 20

Time: 3 hours

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.

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.

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.

TEXT 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.

REFERENCE BOOKS
1. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
2. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

BCA – 123   COMPUTER-ORIENTED STATISTICAL METHODS

Maximum Marks: 100   **External: 80**
                                                        Internal: 20

Time: 3 hours

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.

UNIT-I
Basic Statistics: Measure of Central Tendency, Preparing frequency, distribution table, Mean Arithmetic, Mean Geometric, Mean Harmonic, Mean, Media, Mode.
Measure of Dispersion: Range, Variance and Standard Deviations; Frequency Distributions and Cumulative Frequency Distributions: Moments and Moments Generating Functions.

UNIT-II
Distribution Patterns: Types of Theoretical Probability; Normal Binomial Poisson distribution.
Correlation and Regression: Types of Correlation, Properties of Coefficient of Correlation, Methods of studying Correlation; Aim of Regression Analysis, Kinds of Regression Analysis.

UNIT-III
Tests of significance: Z-test, Student T-test, Chi-square test.
Curve fitting: Method of least squares and Polynomial fit.

UNIT-IV
ANOVA: Meaning, Assumptions, Cochran's Theorem (only statement), One way classification, ANOVA Table for One-Way Classified Data, Baye's theorem in decision-making, Forecasting techniques.

REFERENCE BOOKS
1. Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons, 1996.
2. Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical   statistics, Sultan Chand and Sons, 1995.
3. Graybill, Introduction to Statistics, McGraw.
4. Anderson, Statistical Modelling, McGraw.

BCA – 124   MATHEMATICAL FOUNDATIONS - II

Maximum Marks: 100   **External: 80**
                                                                Internal: 20

Time: 3 hours

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.

UNIT- I
Propositions and logical operators, Truth tables and propositions generated by a set. Equivalence and implications, Laws of logic, Mathematical system, Proposition over a universe, Mathematical induction, Quantifiers

UNIT- II
Binary operations on a non empty set, Groups, Subgroups, Normal Subgroups, Cosets, Factor groups, Rings, Sub rings, Ideals, Factor rings, Prime ideals, Minimal ideal, Fields, direct product of groups, Isomorphism of groups and rings   (definitions and examples only)

UNIT- III
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 i.e. $AX=0$ and $AX=B$

UNIT- IV
Characteristic equations of a square matrix, Cayley-Hamilton Theorem, Eigen values and eigen vectors, Eigen values and eigen vectors of symmetric skew symmetric, Hermitian and skew – Hermitan matrices, Diagonalization of a square matrix.

REFERENCE BOOKS
1.   Babu Ram : Discrete Mathematics
2.   Shanti Naryana : A text book of matrices

BCA – 125   ACCOUNTING AND FINANCIAL MANAGEMENT

Maximum Marks: 100   **External: 80**
                                                          Internal: 20

Time: 3 hours

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.

UNIT-I
The basic Financial Accounts, types of accounts, Rules of Entries of transaction, Journal.
Cash Book – Types, Format of Cash book, Balancing of Cash Book, Subsidiary books - Purchase, Sales, Purchase return and sales return.
Ledger, posting of entries.

UNIT - II
Trial Balance, Rectification of errors, adjustment entries. Depreciation and Inflation.
Principles of Cost Accounting, Valuation of Stocks, Allocation of Overheads, Methods of material issues.

UNIT - III
Pay roll department, Preparation of Pay roll, Preparation of wage record, Methods of payments of wages, overview of computerized method for payroll preparation.

UNIT - VI
Inventory account and store record, inventory or stock control and cost accounting, Department demand and supply method of stock control.
Classification and condition of material Report on material handling.
Overview of computerized accounting process – Introduction to accounting system software, their features and some basic operations.

TEXT BOOKS
1. Mazda, Engineering Management, Addisen Wesley
2. Dr. S P Gupta, Management Accounting
3. I.M.Pandey, Financial Management, Vikas Publication.

BCA- 126   PERSONALITY DEVELOPMENT

Maximum Marks: 100   **External: 80**
                                                                          Internal: 20

Time: 3 hours

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.

UNIT- I
Personality & Personal Grooming – A Brief Introduction
Personality and self-concept, Element of Personality, Determinants of Personality, Causes of deranged Personality, Personality Analysis
Grooming, Personal hygiene, Social, Business and Dining Etiquettes, Body language use and misuse, Art of good Conversation, Art of Intelligent Listening.

UNIT- II
Interpersonal Skills & Role playing: Dealing with seniors, colleagues, juniors, customers, suppliers, contract workers, owners etc at work place

UNIT- III
Group Discussion & Presentation skills: Team behavior, how to effectively conduct yourself during GD, do's and don'ts, clarity of thoughts and its expression
Presentation skills & seminar skills

UNIT- IV
Interviews Preparation: Intent and purpose, selection procedure, types of interviews, Self planning, writing winning resume, knowledge of company profiles, academics and professional knowledge review, update on current affairs and possible questions, time – keeping, grooming, dress code, document portfolio, frequently asked questions and their appropriate answers, self – introduction, panel addressing, mental frame – work during interviews

REFERENCE BOOKS
(1) Personal management and Human Resources, by C.S. Venkata Ratanam and B.K. Srivastava, Published by Tata McGraw Hill Publishing Ltd. New Delhi
(2) Human Behaviour at Work, by: Keith Davis, Tata McGraw Hill Pub. Ltd. N. Delhi
(3) Im OK, You re OK, by : Thomas A. Harris, Publsihed By : Pan Books, London and Sydney
(4) Pleasure of your Company, by : Ranjana Salgaocar, Published By : Pyramid Publishers, Goa
(5) How to get the job you want, by : Arun Agarwal, Published By : Vision Books, New Delhi
(6) Get That Job, Rohit Anand & Sanjeev Bikhachandani, Harper Collins

BCA – 231   **'C' PROGRAMMING – II**

Maximum Marks: 100   **External: 80**
                                                    Internal: 20

Time: 3 hours

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.

UNIT – I
Strings in 'C': Introduction, Declaration and initialization of string, String I/O, Array of strings, String manipulation functions: String length, copy, compare, concatenate, search for a substring.
Structure and Union: Introduction, Features of structures, Declaration and initialization of structures, Structure within structure, Array of structures, Structure and functions. Union: Introduction, Union of structures. Typedef, Enumerations.

UNIT – II
Pointers: Introduction, Pointer variables, Pointer operators, Pointer assignment, Pointer conversions, Pointer arithmetic, Pointer comparison, Pointers and arrays, Pointers and functions, Pointers and strings, Pointer to pointer, dynamic allocation using pointers.

UNIT – III
Files: Introduction, File types, File operations, File I/O, Structure Read and write in a file, Errors in file handling, Random-access I/O in files.

UNIT – IV
Preprocessor: Introduction, #define, macros, macro versus functions, #include, Conditional compilation directives, undefining a macro. Command line arguments: defining and using command line arguments.

TEXT BOOKS
1. Yashwant Kanetker, "Let us C", BPB publications.
2. Balagurusamy, E., "Programming in ANSI C", 4e, Tata McGraw-Hill

REFERENCE BOOKS
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 – 232   DATA STRUCTURES – I

Maximum Marks: 100   **External: 80**
                                                                          Internal: 20

Time: 3 hours

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.

UNIT – I
Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space tradeoff, Big-O notataion.
Strings: Introduction, Stroing strings, String operations, Pattern matching algorithms.

UNIT – II
Arrays: Introduction, Linear arrays, Representation of linear array in memory, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Parallel arrays, Sparce matrics.
Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way linked list, Garbage collection, Applications of linked lists.

UNIT – III
Stack: Introduction, Array and linked representation of stacks, Operations on stacks, Applications of stacks: Polish notation, Recursion.
Queues: Introduction, Array and linked representation of queues, Operations on queues, Deques, Priority Queues, Applications of queues.

UNIT – IV
Tree: Introduction, Definition, Representing Binary tree in memory, Traversing binary trees, Traversal algorithms using stacks.
Graph: Introduction, Graph theory terminology, Sequential and linked representation of graphs.

TEXT BOOKS
1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C", Orient Longman.

REFERENCE BOOKS:
1. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
2. Mark Allen Weiss Data Structures and Algorithm Analysis In C, Addison- Wesley, (An Imprint Of Pearson Education), Mexico City.Prentice- Hall Of India Pvt. Ltd., New Delhi.
3. Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, "Data Structures Using C", Prentice- Hall of India Pvt. Ltd., New Delhi.

BCA – 233 COMPUTER ARCHITECTURE – I

Maximum Marks: 100   **External: 80**
                                                                       Internal: 20

Time: 3 hours

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.

UNIT – I

I/O Units: Early I/O devices, dot-matrix printers, inkjet printers, laser printers. Information exchange between devices – serial and parallel modes of transfer, synchronous and asynchronous mode of transfer – source-initiated, destination-initiated asynchronous data transfer, handshaking. Buffered I/O, Internal buffering. DMA & transfer modes. Data Channel organization, I/O bus, external interface, device controller and internal interface, processor and memory interfaces, ways of connecting devices on a bus, PCI.

UNIT – II

Arithmetic Unit: Main sub-units – memory data register, accumulator, multiplier quotient register, adder and logic processor, shift counter, status flip-flops. Arithmetic operations – addition and subtraction, shifting, data transfer, multiplication, division, logic operations, storing.

Innovations in Arithmetic Unit: Speed of addition – addition without carries, carry storage adders, carry anticipation, the carry look ahead scheme. Multiplication – multiplication in half words, Booth's algorithm, multiplication using a power of two radix, multiplication using carry storage adders.

UNIT – III

Memory Systems: Speed imbalance between the arithmetic and memory units, advantages of memory hierarchies, memory interleaving, problems of management of memory hierarchies, operation of virtual memories. Associative memories. Cache memories – operation of the cache, comparison of cache and virtual memory system, schemes for cache organization, word or block replacement, writing into the cache, multilevel caches.

UNIT – IV

General Organization and Control: Addressing schemes – one, two and three address schemes, no-address scheme, address modification and index registers, general purpose registers, addressing modes, stack organization, use of stack for evaluation of expressions, interrupt processing, subroutine return, storing local variables, storing parameters, implementation of stacks, stack organized processors.

Register Transfer Language, Microprogramming, implementation of a microprogrammed control, vertical and horizontal microprogramming.

TEXT BOOKS:
1. P.V.S. Rao, "Computer System Architecture", PHI, 2009
2. John D. Carpinelli, "Computer System Organization and Architecture", Pearson, 2009

REFERENCE BOOKS:
1. M. Morris Mano, "Computer Architecture", 3/e, PHI, 2001.
2. John P. Hayes, "Computer Architecture and Organization", McGraw-Hill, 1998
3. William Stallings, "Computer organization and Architecture", PHI, 1999.

BCA – 234   INTRODUCTION TO DATABASE SYSTEM

Maximum Marks: 100   **External: 80**
                                                                         Internal: 20

Time: 3 hours

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.

UNIT – I

Basic Concepts – Data, Information, Records and files. Traditional file –based Systems-File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics of Database Approach, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions and Components, Advantages and Disadvantages of DBMS.
Roles in the Database Environment - Data and Database Administrator, Database Designers, Applications Developers and Users.

UNIT – II

Database System Architecture – Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances.
Data Independence – Logical and Physical Data Independence.
Classification of Database Management System, Centralized and Client Server architecture to DBMS.
Data Models: Records- based Data Models, Object-based Data Models, Physical Data   Models and Conceptual Modeling.

UNIT – III

Entity-Relationship Model – Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams.
Basic Concepts of Hierarchical and Network Data Model.

UNIT – IV

Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, Base Tables and Views.

TEXT BOOKS:
1. Elmasri & Navathe, "Fundamentals of Database Systems", 5th edition, Pearson   Education.

REFERENCE BOOKS:
1. Thomas Connolly Carolyn Begg, "Database Systems", 3/e, Pearson Education
2. C. J. Date, "An Introduction to Database Systems", 8th edition, Addison Wesley N. Delhi.

BCA – 235   STRUCTURED SYSTEM ANALYSIS AND DESIGN

Maximum Marks: 100   External: 80
                                                          Internal: 20

Time: 3 hours

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.

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.

Role of system analyst.

UNIT – II

System Planning: Bases for planning in system analysis: Dimensions of Planning.

Initial Investigation: Determining user's requirements and analysis, fact finding process and techniques.

Tools of structured Analysis: Data Flow diagram, data dictionary, IPO and HIPO charts, Gantt charts, pseudo codes, Flow charts, decision tree, decision tables.

Feasibility study: Technical, Operational & Economic Feasibilities.

UNIT – III

Cost/Benefit Analysis: Data analysis cost and benefit analysis of a system.

Input/ Output and Form Design, File Organization and database design: Introduction to files and database, File structures and organization, objectives of database design, logical and physical view of data.

UNIT – IV

System testing: Introduction, objectives of testing, test planning, testing techniques.

Quality assurance: Goal of quality assurance, levels of quality assurance

System implementation and software maintenance: primary activities in maintenance, reducing maintenance costs.

TEXT BOOKS:

1. Awad M. Elias, "System Analysis and Design", Galgotia Publication.

REFERENCE BOOKS:

1. Igor Hawryszkiewyez, "Introduction to System Analysis and Design", 4th edition, Prentice-Hall.
2. Jeffrey L. Whitten, and Lonnie D. Bentey, "Systems analysis and Design Methods", 4th edition, Tata McGraw-Hill.
3. Mark Lejk, and David Deeks, "An Introduction to System Analysis Techniques", Prentice Hall.
4. Don Yeates, Maura Shields and David Helmy, "System Analysis and Design", Longman group limited, 1994.

BCA-236   MATHEMATICAL FOUNDATIONS – III

Maximum Marks: 100   External: 80
                                                            Internal: 20

Time: 3 hours

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.

UNIT – I
Derivative of functions of defined parametrically, Derivative of Logarithmic exponential, trigonometric, inverse trigonometric and hyperbola functions.
Derivatives of higher orders, Successive differentiation. Leibnitz's Theorem.

UNIT – II
Tangents and Normals: Length of tangent, suntangent, normal and subnormal. Polar subtangent, polar subnormal, pedal equations.
Taylor's theorem and Maclaurin's theorem: Taylors and Maclaurin's series expansion, indeterminate forms. Functions of more than one variables and its continuity.

UNIT– III
Asymptotes: Cartesian coordinate, intersection of curve and its asymptotes, Asympotes in polar coordinates.
Multiple points: cusp, nodes and conjugate points, types of cusp, test for concavity and convexity. Points of inflexion.
UNIT – IV
Curvature: radius of curvature for Cartesian, parametric, polar curves. Newton;s method, radius of curvature for pedal curve, tangential polar equation , center of curvature , circle of curvature ,code of curvature and evolute.
Tracing of curves in Cartesain, parametric and polar coordinates.

REFERENCE BOOKS:
1. Om. P. Chug, R.S. Dahiya, G.L. Gupta, "Topics in Mathematics (Calculus & solid geometry)", Laxmi Publications (P) Ltd., New Delhi.
2. Shanti Narayan, "Differential Calculus", S. Chand and Co. Ltd.
3. S. K. Pundir and B. Singh, "Advance Calculus", Pragati Prakashan.

BCA – 241   WEB DESIGNING – I

Maximum Marks: 100   **External: 80**
                                                          Internal: 20

Time: 3 hours

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.

UNIT – I

Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic features; Web Browsers; Web Servers; Hypertext Transfer Protocol; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools;

UNIT – II

Web Publishing: Hosting your Site; Internet Service Provider; Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names; Creating a Website and the Markup Languages (HTML, DHTML);

UNIT – III

Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts;

UNIT – IV

Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes;

TEXT BOOKS:
1. Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill.
2. Ramesh Bangia, "Multimedia and Web Technology", Firewall Media.

REFERENCE BOOKS:
1. Thomas A. Powell, "Web Design: The Complete Reference" , 4/e, Tata McGraw-Hill
2. Wendy Willard, "HTML Beginners Guide", Tata McGraw-Hill.
3. Deitel and Goldberg, "Internet and World Wide Web, How to Program", PHI.

BCA – 242   DATA STRUCTURE – II

Maximum Marks: 100   **External: 80**
                                                          Internal: 20

Time: 3 hours

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.

UNIT – I
Tree: Header nodes, Threads, Binary search trees, Searching, Insertion and deletion in a Binary search tree, AVL search trees, Insertion and deletion in AVL search tree, m-way search tree, Searching, Insertion and deletion in an m-way search tree, B-trees, Searching, Insertion and deletion in a B-tree, Huffman's algorithm, General trees.

UNIT – II
Graphs: Warshall's algorithm for shortest path, Dijkstra algorithm for shortest path, Operations on graphs, Traversal of graph, Topological sorting.

UNIT – III
Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort, Tournament sort, Comparison of various sorting and searching algorithms on the basis of their complexity.

UNIT – IV
Files: Introduction Attributes of a file, Classification of files, File operations, Comparison of various types of files, File organization: Sequential, Indexed-sequential, Random-access file.
Hashing: Introduction, Collision resolution

TEXT BOOKS
1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C", Orientlongman.

REFERENCE BOOKS
1. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison- Wesley, (An Imprint Of Pearson Education), Mexico City.Prentice- Hall Of India Pvt. Ltd., New Delhi.

BCA – 243 COMPUTER ARCHITECTURE – II

Maximum Marks: 100   **External: 80**
                                                                          Internal: 20

Time: 3 hours

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.

UNIT – I

Computer Arithmetic: Unsigned addition, subtraction, multiplication and division algorithms, 2's complement addition, subtraction and multiplication algorithms, floating point numbers addition, subtraction, multiplication and division algorithms. IEEE 754 floating-point standard.

UNIT – II

Interrupt Structures: Types of interrupts, Interrupt processing, levels and priorities of interrupts, implementing interrupts inside the CPU.
Instruction set architectures. Reduced Instruction Set Computing (RISC): Characteristics of RISC, RISC instruction set, RISC vs CISC.

UNIT – III

Look Ahead & Pipelining: Instruction look ahead, look ahead and look behind, advantages of look ahead systems. Pipelined execution of instruction – operation of pipelines, optimizing a pipeline, speedup due to pipelining, running the pipeline with minimum idling, multifunction pipelines, organization of pipelines in a general purpose computer.

UNIT – IV

Introduction to Parallel Processing: Parallelism in uniprocessor systems, organization of multiprocessor systems, Flynn's classification, system topologies, MIMD system architectures, communication in multiprocessor systems, fixed connections, reconfigurable connections, routing on multistage interconnection networks, data flow computing.

TEXT BOOKS:
1. John D. Carpinelli, "Computer System Organization and Architecture", Pearson, 2009
2. P.V.S. Rao, "Computer System Architecture", PHI, 2009

REFERENCE BOOKS:
1.   M. Morris Mano, "Computer System Architecture", 3/e, PHI, 2001.
2. John P. Hayes, "Computer Architecture and Organization", McGraw-Hill, 1998
3. William Stallings, "Computer organization and Architecture", PHI, 1999.

BCA – 244   RELATIONAL DATA BASE MANAGEMENT SYSTEM

Maximum Marks: 100   External: 80
                                                                 Internal: 20

Time: 3 hours

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.

UNIT – I

Relational Model Concepts, Codd's Rules for Relational Model,
Relational Algebra:-Selection and Projection, Set Operation, Renaming, Join and Division.
Relational Calculus: Tuple Relational Calculus and Domain Relational Calculus.

UNIT – II

Functional Dependencies and Normalization:-Purpose, Data Redundancy and Update Anomalies.
Functional Dependencies:-Full Functional Dependencies and Transitive Functional Dependencies,
Characteristics of Functional Dependencies.
Decomposition and Normal Forms (1NF, 2NF, 3NF & BCNF).

UNIT – III

SQL: Data Definition and data types, Specifying Constraints in SQL, Schema, Change statement, Basic Queries in SQL, Insert, Delete and Update Statements, Views.

UNIT – IV

PL/SQL-Introduction, Advantages of PL/SQL,
The Generic PL/SQL Block: PL/SQL Execution Environment,
PL/SQL Character set and Data Types,
Control Structure in PL/SQL.

TEXT BOOKS:

1. Elmasri & Navathe, "Fundamentals of Database Systems", 5th edition, Pearson Education.
2. Ivan Bayross, "SQL, PL/SQL-The Programming Language of ORACLE", BPB Publications 3rd edition.

REFERENCE BOOKS:

1. C. J. Date, "An Introduction to Database Systems", 8th edition, Addison Wesley N. Delhi.

BCA – 245   MANAGEMENT INFORMATION SYSTEM

Maximum Marks: 100   **External: 80**
                                                                         Internal: 20

Time: 3 hours
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.

UNIT – I
Introduction to system and Basic System Concepts, Types of Systems, The Systems Approach, Information System: Definition & Characteristics, Types of information, Role of Information in Decision-Making, Sub-Systems of an Information system: EDP and MIS management levels, EDP/MIS/DSS.

UNIT –II
An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Un-structured decisions, Formal vs. Informal systems.

UNIT – III
Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation, Pitfalls in MIS Development.

UNIT – IV
Functional MIS: A Study of Personnel, Financial and production MIS, Introduction to e-business systems, ecommerce – technologies, applications, Decision support systems – support systems for planning, control and decision-making

TEXT BOOK:
1. J. Kanter, "Management/Information Systems", PHI.
2. Gordon B. Davis, M. H. Olson, "Management Information Systems – Conceptual foundations, structure and Development", McGraw Hill.

REFERENCE BOOK:
1. James A. O'Brien, "Management Information Systems", Tata McGraw-Hill.
2. James A. Senn, "Analysis & Design of Information Systems", Second edition, McGraw Hill.
3. Robert G. Murdick & Joel E. Ross & James R. Claggett, "Information Systems for Modern Management", PHI.
4. Lucas, "Analysis, Design & Implementation of Information System", McGraw Hill.

BCA – 246   MATHEMATICAL FOUNDATIONS – IV

Maximum Marks: 100   External: 80
                                                          Internal: 20
Time: 3 hours

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.

UNIT – I
Partial derivatives of first and second order. Eluer's theorem on homogeneous functions. Differentiation of composite and implicit functions.
The notion of total differential, Extreme values: Maxima and Minima of function of two or more variable, Lagrange's method of multiplier.

UNIT – II
Reduction formula, rectification of curve represented in Cartesian, parametric and polar forms, intrinsic equation of curve.

UNIT– III
Quadrature: area of curves and area of surfaces of solid of revolution in Cartesian, parametric and polar forms.
Jacobian, Double and Triple integration, substitution method for double and triple integrals, Application of double and triple integrals for finding volume and surfaces.

UNIT – IV
Beta and Gama functions, their properties and relationships. Differentiation under integral sign.
Equation and simple properties of spheres, cones, cylinders.

REFERENCE BOOKS:
1. Om. P. Chug, R.S. Dahiya, G.L. Gupta, "Topics in Mathematics (Calculus & solid geometry)", Laxmi Publ.(p) ltd New Delhi.
2. J.N. Sharma, A.R. Vasishtha, "Real Analysis", Krishana Prakashan Media(P) Ltd., Meerut (U.P.)
3. Shanti Narayan, "Differential Calculus", S. Chand and Co. Ltd.
4. Shanti Narayan, "Integral Calculus", S. Chand and Co. Ltd.
5. Shanti Narayan, "A course of Mathematical Analysis", S. Chand and Co. Ltd.
6. S. K. Pundir, "Advance Calculus", B. Singh: Pragati Prakashan.

BCA – 351   INTRODUCTION TO OBJECT ORIENTED PROGRAMMING

Maximum Marks: 100   **External: 80**
                                                                       Internal: 20

Time: 3 hours

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.

UNIT – I
Object oriented Programming: Object-Oriented programming features and benefits. Object-Oriented features of C++, Class and Objects, Data Hiding & Encapsulation, Structures, Data members and Member functions, Static Data Members and Member Functions, Nested and Local Class, Accessing Members of Class and Structure, Preprocessor Directives, Namespace.

UNIT – II
Initialization & Cleanup: Constructors – Default, Parameterized & Copy Constructors, and Default Values to Parameters, Destructors.
Console I/O: Hierarchy of Console Stream Classes, Unformatted And Formatted I/O Operations, Manipulators.

UNIT – III
Friend Function, Friend Class, Arrays, array of Objects, Passing and Returning Objects to Functions, String Handling in C++.
Dynamic Memory Management: Pointers, new and delete Operator, Array of Pointers to Objects, this Pointer, Passing Parameters to Functions by Reference & pointers.

UNIT – IV
Static Polymorphism: Operators in C++, Precedence and Associativity Rules, Operator Overloading, Unary & Binary Operators Overloading, Function Overloading, Inline and External Linkage Functions, Merits/Demerits of Static Polymorphism.

TEXT BOOKS:
1.   Herbert Scildt, C++, The Complete Reference, Tata McGraw-Hill
2.   Robert Lafore, Object Oriented Programming in C++

REFERENCE BOOKS:
1. Bjarne Stroustrup, The C++ Programming Language, Pearson
2. Balaguruswami, E., Object Oriented Programming In C++, Tata McGraw-Hill

Maximum Marks: 100   **External: 80**
                                                                 Internal: 20

Time: 3 hours

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.

UNIT – I

Introductory Concepts: Operating system functions and characteristics, historical evolution of operating systems, Real time systems, Distributed systems, Methodologies for implementation of O/S service system calls, system programs.

UNIT – II

Process management: Process concepts, Process states and Process Control Block.
CPU Scheduling: Scheduling criteria, Levels of Scheduling, Scheduling algorithms, Multiple processor scheduling.
Deadlocks: Deadlock characterization, Deadlock prevention and avoidance, Deadlock detection and recovery, practical considerations.

UNIT – III

Concurrent Processes: Critical section problem, Semaphores, Classical process co-ordination problems and their solutions, Inter-process Communications.
Storage Management: memory management of single-user and multiuser operating system, partitioning, swapping, paging and segmentation, virtual memory, Page replacement Algorithms, Thrashing.

UNIT – IV

Device and file management: Disk scheduling, Disk structure, Disk management, File Systems: Functions of the system, File access and allocation methods, Directory Systems: Structured Organizations, directory   and file protection mechanisms.

TEXT BOOKS:
1. Silberschatz A., Galvin P.B.,and Gagne G., "Operating System Concepts", John Wiley & Sons, Inc.,New York.
2. Godbole, A.S., "Operating Systems", Tata McGraw-Hill Publishing Company, New Delhi.

REFERENCE BOOKS:
1. Deitel, H.M., "Operating Systems", Addison- Wesley Publishing Company, New York.
2. Tanenbaum, A.S., "Operating System- Design and Implementation", Prentice Hall of India, New Delhi.

BCA – 353   SOFTWARE ENGINEERING

Maximum Marks: 100   External: 80
                                                            Internal: 20

Time: 3 hours

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.

UNIT – I
Software Crisis – problem and causes, Software life cycle models: Waterfall, Prototype, Evolutionary and Spiral models.
Software Project Planning: Cost estimation: COCOMO model, Putnam Resource Allocation Model, Risk management, project scheduling, personnel planning, team structure, Software configuration management, quality assurance, project monitoring.

UNIT – II
Software Requirement Analysis and Specifications: Structured Analysis, Data Flow Diagrams, Data Dictionaries, Entity-Relationship diagrams, Software Requirement and Specifications, Behavioral and non-behavioral requirements.
Software Design: Design fundamentals, problem partitioning and abstraction, design methodology, Cohesion & Coupling, Classification of Cohesiveness & Coupling.

UNIT – III
Coding: Programming style, structured programming.
Software Testing: Testing fundamentals, Functional testing: Boundary Value Analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing: Control flow based and data flow based testing, loop testing;

UNIT – IV
Software testing strategies: unit testing, integration testing, Validation testing, System testing, Alpha and Beta testing.
Software Maintenance: Type of maintenance, Management of Maintenance, Maintenance Process, maintenance characteristics.

TEXT BOOKS:
1. Pressman R. S., "Software Engineering – A Practitioner's Approach", Tata McGraw Hill.
2. Jalote P., "An Integrated approach to Software Engineering", Narosa.

REFERENCE BOOKS:
1. Sommerville, "Software Engineering", Addison Wesley.
2. Fairley R., "Software Engineering Concepts", Tata McGraw Hill.
3. James Peter, W Pedrycz, "Software Engineering", John Wiley & Sons.

BCA – 354   COMPUTER NETWORKS

Maximum Marks: 100   **External: 80**
                                                                    Internal: 20

Time: 3 hours

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.

UNIT – I

Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; Types of Computer Networks and their Topologies; Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; Network Applications and Application Protocols; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model, Peer-to-Peer Model, Web-Based Model, Network Architecture and the OSI Reference Model; Example Networks: The Internet, X.25, Frame Relay, ATM;

UNIT – II

Analog and Digital Communications Concepts: Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Dialup Networking; Analog Modem Concepts; DSL Service;

UNIT - III

 Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Sliding Window Protocols; Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring; Introduction to LAN technologies: Ethernet, switched Ethernet, VLAN, fast Ethernet, gigabit Ethernet, token ring, FDDI, Wireless LANs; Bluetooth;

Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways;

UNIT – IV

Network Layer and Routing Concepts: Virtual Circuits and Datagrams; Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; Congestion Control Algorithms; Internetworking;
Network Security Issues: Security threats; Encryption Methods; Authentication; Symmetric –Key Algorithms; Public-Key Algorithms;

TEXT BOOKS:
1. Michael A. Gallo, William M. Hancock, "Computer Communications and Networking Technologies", CENGAGE Learning.
2. Andrew S. Tanenbaum, "Computer Networks", Pearson Education.

REFERENCE BOOKS:
1. James F. Kurose, Keith W. Ross, "Computer Networking", Pearson Education.
2. Behrouz A Forouzan, "Data Communications and Networking", McGraw Hill.

BCA – 355   COMPUTER GRAPHICS

Maximum Marks: 100   **External: 80**
                                                                 Internal: 20

Time: 3 hours

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.

UNIT – I
Overview of Computer Graphics: Historical background of Computer Graphics; Applications of Computer Graphics; Popular Graphics Softwares; Display devices: Pixel, Resolution, Aspect Ratio; Raster-Scan Systems and Display : CRT, Refresh Rate and Interlacing; Bit Planes, Color Depth and Color Palette, Frame Buffer, Video Controller, Raster-Scan Display Processor, Lookup Table, RGB Color Model, Color CRT monitors; Random-Scan Displays; Flat Panel Display : LCD, Plasma Panel; Graphics Monitors and Workstations; Popular Graphics Input Devices; Hard-Copy Devices;

UNIT – II
Coordinate Representations; Graphics Primitives: Line Drawing Algorithms- DDA Algorithm, Bresenham's Algorithm; Different Line Styles; Circle-Generating Algorithms- Properties of Circles, Circle Drawing using Polar Coordinates, Bresenham's Circle Drawing Algorithm; Ellipse-Generating Algorithms; Anti-aliasing;

UNIT – III
Geometric Transformations: Scaling, Translation, Rotation; Matrix Representations and Homogeneous Coordinates; Rotation Relative to an Arbitrary Point; Reflection; Shearing; Coordinate Transformation; Inverse Transformation; Affine Transformation; Raster Transformation; Composite Transformations; Fixed-point Scaling; Input Techniques: Pointing, Positioning, Rubber-band method, Dragging;

UNIT – IV
Two-Dimensional Viewing: Window-to-Viewport Coordinate Transformation; Zooming; Panning; Clipping: Point Clipping, Line Clipping- Cohen-Sutherland line clipping, Mid-point Subdivision Line Clipping; Polygon Clipping – Sutherland-Hodgeman Polygon Clipping; Text Clipping; Graphics in Three Dimensions: Displays in Three Dimensions, 3-D Transformations; 3-D Viewing : Viewing Parameters, Projections, Parallel and Perspective projection; Hidden Surfaces: Z-Buffer Method, Painter's Algorithm;

TEXT BOOKS:
1. "Computer Graphics", Donald Hearn, M. Pauline Baker, PHI.
2. "Computer Graphics", Apurva A. Desai, PHI, 2010

REFERENCE BOOKS:
1. "Principles of Interactive Computer Graphics", Newmann & Sproull, McGraw Hill.
2. "Computer Graphics Principles & Practice", Foley etc. Addison Wesley.
3. "Procedural Elements of Computer Graphics", Rogers, McGraw Hill.
4. "Introduction to Computer Graphics and Multimedia", Anirban Mukhopadhyay, Arup Chattopadhyay, Vikas.
5. "Computer Graphics", Zhigang Xiang, Roy Plastock, Tata McGraw Hill.
6. "Fundamentals of Computer Graphics and Multimedia", D.P. Mukherjee, PHI.

BCA-356   Web DESIGNING – II

Maximum Marks: 100   **External: 80**
                                                                   Internal: 20

Time: 3 hours

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.

UNIT – I
Brief Introduction to Interactivity tools: CGI; Features of Java; Java Script; Features of ASP; VBScript; Macromedia Flash; Macromedia Dreamweaver; PHP;

UNIT – II
Introduction and Features of Adobe Photoshop; Microsoft FrontPage Introduction; Features; Title Bar; Menu bar; FrontPage Tool Bar; Style, FontFace andFormatting Bar; Scroll Bars;

UNIT – III
Introduction to DHTML and its features; Events; Cascading Style Sheets: Creating Style Sheets; Common Tasks with CSS: Text, Fonts, Margins, Links, Tables, Colors; Marquee; Mouseovers; Filters and Transitions; Adding Links; Adding Tables; Adding Forms; Adding Image and Sound;

UNIT – IV
Extensible Mark-up Language(XML): Introduction; Features; XML Support and Usage; Structure of XML Documents; Structures in XML;Creating Document Type Declarations; Flow Objects; Working with Text andFont; Color and Background properties;

TEXT BOOKS:
1. Internet and Web Technologies, Raj Kamal, Tata McGraw-Hill.
2. Multimedia and Web Technology, Ramesh Bangia, Firewall Media.
3. Internet and Web Design, ITLESL Research and Development Wing, Macmillan India .

REFERENCE BOOKS:
1. Web Design: The Complete Reference , 4/e, Thomas A. Powell, Tata McGraw-Hill
2. Internet and World Wide Web, How to Program, Deitel and Goldberg, PHI.

BCA – 361   PROGRAMMING IN 'C++'

Maximum Marks: 100   **External: 80**
                                                          Internal: 20

Time: 3 hours

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.

UNIT – I

Inheritance: Rules of Derivations – Private, Protected and Public Derivations, Different Forms of Inheritance – Single, Multiple, Multilevel, Hierarchical and Multipath Inheritance, Roles of Constructors and Destructors in Inheritance.

UNIT – II

Dynamic Polymorphism: Function Overriding, Virtual Function and its Need, Pure Virtual Function, Abstract Class, Virtual Derivation, Virtual Destructor.

Type Conversion: Basic Type Conversion, Conversion Between Objects And Basic Types, Conversion Between Objects Of Different Classes.

UNIT – III

Genericity in C++: Template Function, Template Class, Inheritance and Templates.

Exception Handling: try, throw and catch constructs, rethrowing an exception, catch all Handlers.

UNIT – IV

Files I/O in C++: Class Hierarchy for Files I/O, Text versus Binary Files, Opening and Closing Files, File Pointers, Manipulators and Error Handling.

TEXT BOOKS:
1. Herbert Scildt, C++, The Complete Reference, Tata McGraw-Hill
2. Robert Lafore, Object Oriented Programming in C++

REFERENCE BOOKS:
1. Bjarne Stroustrup, The C++ Programming Language, Pearson.
2. Balaguruswami, E., Object Oriented Programming In C++, Tata McGraw-Hill

BCA – 362   INTRODUCTION TO LINUX

Maximum Marks: 100   **External: 80**
                                                                 Internal: 20

Time: 3 hours

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.

UNIT – I

Introduction to Linux: Linux distributions, Overview of Linux operating system, Linux architecture, Features of Linux, Accessing Linux system, Starting and shutting down system, Logging in and Logging out. Comparison of Linux with other operating systems.

UNIT – II

Commands in Linux: General-Purpose commands, File oriented commands, directory oriented commands, Communication-oriented commands, process oriented commands, etc.
Regular expressions & Filters in Linux: Simple filters viz. more, wc, diff, sort, uniq, grep. Introducing regular expressions.

UNIT – III

Linux file system: Linux files, inodes and structure and file system, file system components, standard file system, file system types.
Processes in Linux: starting and stopping processes,   initialization Processes, mechanism of process creation, Job control in linux using at, batch, cron & time.

UNIT – IV

Shell Programming: VI editor, shell variables, I/O in shell, control structures, loops, subprograms, creating & executing shell scripts in linux.

TEXT BOOKS:
1. Yashwant Kanetkar, UNIX & Shell programming – BPB.
2. M.G.Venkateshmurthy, Introduction to UNIX & Shell Programming, Pearson Education.
3. Richard Petersen, The Complete Reference – Linux, McGraw-Hill.

REFERENCE BOOKS:
1. Stephen Prata, Advanced UNIX – A programmer's Guide, SAMS.
2. Sumitabha Das, Your UNIX - The Ultimate Guide, Tata McGraw-Hill.

BCA – 363   INTERNET TECHNOLOGY

Maximum Marks: 100   **External: 80**
                                                              Internal: 20
Time: 3 hours

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.

UNIT – I
Internet and TCP/IP: Introduction to the Internet; Internet History, Internet Administration; Internet and Intranet; Internet Services; TCP/IP model and its protocols; IP addresses: IPv4; Subnetting IPv4addresses; Supernetting; Next generation Internet Protocol (IPv6); The need for IPv6; Packet Format; IPv6 Addresses; Extension Headers;

UNIT – II
TCP/IPs Transport and Network Layer Protocols: Role of TCP, UDP, IP, and Port numbers; Format of TCP, UDP and IP; TCP services; TCP connection management; Remote Procedure Call; SCTP; IP address resolution- DNS; Domain Name Space; DNS mapping; Recursive and Iterative resolution; Resource records; Mapping Internet Addresses to Physical Addresses; ARP, RARP, BOOTP, DHCP; ICMP; IGMP;

UNIT – III
TCP/IP Application Level Protocols: Electronic Mail : Architecture; SMTP, MIME, POP, IMAP; Web Based Mail; File Access and Transfer: FTP, Anonymous FTP, TFTP, NFS; Remote Login using TELNET; Voice and Video over IP: RTP, RTCP, IP Telephony and Signaling, Resource Reservation and Quality of Service, RSVP;

UNIT – IV
Routing in Internet: RIP, OSPF, BGP; Internet Multicasting; Mobile IP; Private Network Interconnection: Network Address Translation (NAT), Virtual Private Network (VPN); Internet Management: SNMP; Internet Security: IPSec, E-Mail Security; Web Security; Firewalls; Digital Signatures; Certificates;

TEXT BOOKS
1. Douglas E. Comer, "Internetworking with TCP/IP Volume – I, Principles, Protocols, and Architectures", Fourth Edition, Pearson Education.
2. Andrew S. Tanenbaum, "Computer Networks", Pearson Education.

REFERENCE BOOKS:
1. Behrouz A Forouzan, "Data Communications and Networking", McGraw Hill.
2. Michael A. Gallo, William M. Hancock, "Computer Communications and Networking Technologies", CENGAGE Learning.
3. James F. Kurose, Keith W. Ross, Computer Networking, A Top-Down Approach Featuring the Internet, Pearson Education.
4. "Introduction to Data Communications and Networking", Wayne Tomasi, Pearson Education.

BCA – 364 VISUAL BASIC

Maximum Marks: 100
External: 80
Internal: 20

Time: 3 hours

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.

UNIT – I

Introduction to VB: Visual & non-visual programming, Procedural, Object-oriented and event-driven programming languages, The VB environment: Menu bar, Toolbar, Project explorer, Toolbox, Properties window, Form designer, Form layout, Immediate window. Visual Development and Event Driven programming.

UNIT – II

Basics of Programming: Variables: Declaring variables, Types of variables, Converting variables types, User-defined data types, Forcing variable declaration, Scope & lifetime of variables. Constants: Named & intrinsic. Operators: Arithmetic, Relational & Logical operators. I/O in VB: Various controls for I/O in VB, Message box, Input Box, Print statement.

UNIT – III

Programming with VB: Decisions and conditions: If statement, If-then-else, Select-case. Looping statements: Do-loops, For-next, While-wend, Exit statement. Nested control structures. Arrays: Declaring and using arrays, one-dimensional and multi-dimensional arrays, Static & dynamic arrays, Arrays of array. Collections: Adding, Removing, Counting, Returning items in a collection, Processing a collection.

UNIT – IV

Programming with VB: Procedures: General & event procedures, Subroutines, Functions, Calling procedures, Arguments- passing mechanisms, Optional arguments, Named arguments, Functions returning custom data types, Functions returning arrays.
Working with forms: Adding multiple forms in VB, Hiding & showing forms, Load & unload statements, Activate & deactivate events, Form-load event, menu designing in VB
Simple programs in VB.

TEXT BOOKS:
1. Steven Holzner, "Visual Basic 6 Programming: Black Book", Dreamtech Press.
2. Evangelos Petroutsos. "Mastering Visual Baisc 6", BPB Publications.
3. Julia Case Bradley & Anita C. Millspaugh, "Programming in Visual Basic 6.0", Tata McGraw-Hill Edition

REFERENCE BOOKS:
1. Michael Halvorson, "Step by Step Microsoft Visual Basic 6.0 Professional", PHI
2. "Visual basic 6 Complete", BPB Publications.
3. Scott Warner, "Teach Yourself Visual basic 6", Tata McGraw-Hill Edition
4. Brian Siler and Jeff Spotts, "Using Visual Basic 6", Special Edition, PHI.

BCA – 365   MULTIMEDIA TECHNOLOGY

Maximum Marks: 100   **External: 80**
                                                                Internal: 20

Time: 3 hours

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.

UNIT – I
Introduction to Multimedia: Components of Multimedia; Hypermedia and Multimedia; Overview of Multimedia Software Tools; Multimedia Hardware and Software; Basic Software Tools; Making Instant Multimedia; Presentation Tools; Multimedia Authoring; Types of Authoring Tools; Card- and Page-Based Authoring Tools; Icon-Based Authoring Tools; Time-Based Authoring Tools; Object-Oriented Authoring Tools; VRML;

UNIT – II
Graphics and Image Data Representation: Graphics/Image Data Types, Popular File Formats; Color Models in Images and Video; Types of Video Signals; Analog and Digital Video: Broadcast Video Standards: NTSC, PAL, SECAM, HDTV; Chroma Subsampling; CCIR Standards for Digital Video;

UNIT – III
Digital Audio: Digitization of Sound; MIDI Versus Digital Audio; Quantization and Transmission of Audio: Coding of Audio; Pulse Code Modulation; Differential Coding of Audio; Lossless Predictive Coding; DPCM; DM; ADPCM;

UNIT – IV
Multimedia Data Compression: Run-Length Coding; Variable-Length Coding; Dictionary-Based Coding; Transform Coding; Image Compression Standards – JPEG standard; Video Compression Techniques: H.261, H.263, MPEG;

TEXT BOOKS:
1. Ze-Nian Li, Mark S. Drew, "Fundamentals of Multimedia", Pearson Education.
2. Tay Vaughan, "Multimedia Making It Work", Tata McGraw- Hill.

REFERENCE BOOKS:
1. Ramesh Bangia, "Multimedia and Web Technology", Firewall Media.
2. John F. Koegel Buford, " Multimedia Systems", Addison Wesley, Pearson Education.
3. Ana Weston Solomon, "Introduction to Multimedia", Tata McGraw-Hill.

BCA – 366   INTRODUCTION TO .NET

Maximum Marks: 100   **External: 80**
                                                                        Internal: 20

Time: 3 hours

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.

UNIT – I

The Framework of .Net: Building blocks of .Net Platform (the CLR, CTS and CLS), Features of .Net, Deploying the .Net Runtime, Architecture of .Net platform, Introduction to namespaces & type distinction. Types & Object in .Net, the evolution of Web development.

UNIT – II

Class Libraries in .Net, Introduction to Assemblies & Manifest in .Net, Metadata & attributes. Introduction to C#: Characteristics of C#, Data types: Value types, reference types, default value, constants, variables, scope of variables, boxing and unboxing.

UNIT – III

Operators and expressions: Arithmetic, relational, logical, bitwise, special operators, evolution of expressions, operator precedence & associativity.
Control constructs in C#: Decision making, loops.
Classes & methods: Class, methods, constructors, destructors, overloading of operators & functions.

UNIT – IV

Inheritance & polymorphism: visibility control,   overriding, abstract class & methods, sealed classes & methods, interfaces.
Advanced features of C#: Exception handling & error handling, automatic memory management, Input and output (Directories, Files, and streams).

TEXT BOOKS:
1. Introduction to C# using .NET By Robert J. Oberg, PHI, 2002.
2. Programming in C# By E. Balaguruswamy, Tata McGraw Hill

REFERENCES BOOKS:
1. The Complete Guide to C# Programming by V. P. Jain
2. C# : A Beginner's Guide, Herbert Schildt, Tata McGraw Hill
3. C# and .NET Platform by Andrew Troelsen, Apress, 1st edition, 2001