

TEACHING AND EXAMINATION SCHEME
Bachelor of Computer Applications - I Year
W.E.F. 2018 - 2019

Paper Name (Theory)	Lec	Exam Hours	MARKS	
			Min	Max
bca-101 Group (I/II/II/IV/V)	3	3	18	50
bca-102 Group (I/II/II/IV/V)	3	3	18	50
bca-103 PC Software	3	3	18	50
bca-104 Programming in C & Data Structure	3	3	18	50
bca-105 Discrete Mathematics	3	3	18	50
bca-106 Multimedia Basics	3	3	18	50
Total of Theory Marks				300

Paper Name (Practical)	Pract Hours	Exam Hours	MARKS	
			Min	Max
bca-107 PC Software Lab	3	3	18	50
bca-108 C Programming & Data Structure Lab	3	3	18	50
bca-109 Multimedia	3	3	18	50
Total of Practical Marks				150

Total of Theory & Practical Marks 450

Group	Choice Papers Names	I Year	II Year	III Year
Group I	Physics	I	II	III
	Mathematics	I	II	III
Group II	Computer Practice	I	II	III
	Information Practice	I	II	III
Group III	Geography	I	II	III
	Sociology	I	II	III
Group IV	Accountancy	I	II	III
	Business Studies	I	II	III
Group V	Skill	I	II	III
	Advance Skills	I	II	III

SCHEME OF EXAMINATION BACHELOR OF COMPUTER APPLICATIONS

Note:

The student has to take any one group from among I, II, III, IV, V. The group will continue for the entire three years of BCA respectively for the first 2 papers and the student will not be allowed to change groups.

Theory:

Part A:

1. 10 Questions of 1.5 mark each – 15 marks
2. Answer should not exceed more than 50 words
3. All questions are compulsory

Part B:

1. 5 Questions of 3 marks each – 15 marks
2. Answer should not exceed more than 50 words
3. All questions are compulsory

Part C:

1. 3 Questions of 7+7+6 marks each – 20 marks.
2. There will be an internal choice in each question.
3. Answer should not exceed 400 words

Practical & Projects:

Practical exams shall be conducted by one internal and one external examiner of a batch of 40 students in a day.

Duration of Practical exam is 3 hours.

A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.

Practical of 50 marks distribution is as under:

- a. 30 marks for practical examination exercise for 3 questions
- b. 10 marks for Viva-voce
- c. 10 marks for Laboratory Exercise File

Max Marks: 50
Group –I (Science)**bca-101Physics**

Physical World and Measurement

Physics: Scope and excitement; nature of physical laws; Physics, technology and society. Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures, Dimensions of physical quantities, dimensional analysis and its applications

Kinematics, Frame of reference, Motion in a straight line: Position-time graph, speed and velocity. Uniform and non-uniform motion, average speed and instantaneous velocity, Uniformly accelerated motion, velocity-time and position-time graphs, relations for uniformly accelerated motion (graphical treatment). Elementary concepts of differentiation and integration for describing motion, Scalar and vector quantities: Position and displacement vectors, general vectors and notation, equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors. Relative velocity, Unit vectors, Resolution of a vector in a plane – rectangular components, Scalar and Vector products of Vectors, Motion in a plane, Cases of uniform velocity and uniform acceleration – projectile motion, Uniform circular motion

Laws of Motion, Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion, Law of conservation of linear momentum and its applications, Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on level circular road, vehicle on banked road).

Work, Energy and Power, Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power, Notion of potential energy, potential energy of a spring, conservative forces; conservation of mechanical energy (kinetic and potential energies); non-conservative forces; motion in a vertical circle, elastic and inelastic collisions in one and two dimensions.

Motion of System of Particles and Rigid Body, Centre of mass of a two-particle system, momentum conservation and centre of mass motion, Centre of mass of a rigid body; centre of mass of uniform rod, Moment of a force, torque, angular momentum, conservation of angular momentum with some examples, Equilibrium of rigid bodies, rigid body rotation and equation of rotational motion, comparison of linear and rotational motions; moment of inertia, radius of gyration. Values of M.I. for simple geometrical objects (no derivation), Statement of parallel and perpendicular axes theorems and their applications

Gravitation Kepler's laws of planetary motion, The universal law of gravitation, Acceleration due to gravity and its variation with altitude and depth, Gravitational potential energy; gravitational potential. Escape velocity, orbital velocity of a satellite, Geostationary satellites

Group –II (Computer)

bca-101 Computer Practices

MANAGEMENT AND ACCOUNTING

Introduction to Management thought, functions, skills of a manager. Overview of Management functions with reference to planning process, leadership, motivation-implication for managers, theories of motivation.

Communication: Process, barriers to communication, role of electronic media and information technology in communication.

Cross-cultural issues in management, social and environmental responsibility

Organizational culture, individual perception, values, attributes, interpersonal effectiveness, power and politics, conflict management, team and group processes

Stress management: Various types of stress, coping mechanism

Accounting: Definition, concepts, standards, basic accounting, entries, ledger, triple column cash book, brief understanding of final accounts, Automatic Accounting processes.

Financial statements, ratio analysis

Cost accounting – CVP analysis, BEP and P/V graph

Budgeting: Meaning of budgeting, flexible and fixed budgets.

Group –III (Arts)

bca-101 Geography

Geography as a Discipline

Geography as an integrating discipline, as a science of spatial attributes. Branches of Geography; Physical Geography and Human Geography. Scope and Career Options

The Earth

Origin and evolution of the earth; Interior of the earth. Wegener's continental drift theory and plate tectonics. Earthquakes and volcanoes: causes, types and effects.

Landforms

Rocks: major types of rocks and their characteristics. Landforms and their evolution.

Geomorphic processes: weathering, mass wasting, erosion and deposition; soil-formation.

Climate

Atmosphere- composition and structure; elements of weather and climate. Insolation-angle of incidence and distribution; heat budget of the earth-heating and cooling of atmosphere (conduction, convection, terrestrial radiation and advection); temperature- factors controlling temperature; distribution of temperature-horizontal and vertical; inversion of temperature.

Pressure-pressure belts; winds-planetary, seasonal and local; air masses and fronts; tropical and extratropical cyclones. Precipitation-evaporation; condensation-dew, frost, fog, mist and cloud; rainfall-types and world distribution. World climates-classification (Koeppen and Thornthwaite), Global warming and climatic changes. Climate and Global Concerns.

Hydrosphere

Basics of Oceanography Oceans - distribution of temperature and salinity. Movements of ocean water-waves, tides and currents; submarine reliefs. Ocean resources and pollution.

Biosphere

Biosphere - importance of plants and other organisms; biodiversity and conservation; ecosystem and ecological balance. Map work on identification of features based on 1 to 6 units on the outline/Physical/Political map of the world.

India - Physical Environment

Introduction, Location, space relations, India's place in the world.

Physiography Structure and Relief; Physiographic Divisions.

Drainage systems: Concept of river basins, Watershed; the Himalayan and the Peninsular rivers.

Group –IV (Commerce)

bca-101Accountancy

FINANCIAL ACCOUNTING

Introduction to Accounting

Accounting - Meaning, Objectives, Types of Accounting Information, Advantages and Limitations. Qualitative Characteristics of Accounting Information: Reliability, Relevance, Understandability and Comparability. Basic Accounting Terms: Business Transaction, Capital, Drawing, Liability, Asset, Revenue, Expenditure, Expense, Income, Losses and Gains, Purchases, Sales, Stock, Debtors, Receivables, Creditors, Payables.

Theory Base of Accounting Basic Assumptions: Accounting Entity, Money Measurement: Going Concern, Accounting Period. Basic Principles: Duality, Verifiability and Objectivity of Evidence, Historical Cost, Revenue Recognition, Matching, Full Disclosure. Modifying Principles: Materiality, Consistency, Prudence, Timeliness, Substance over Form, Variations in accounting practices. Accounting Standards: Meaning, nature and need.

Generation of Vouchers and Recording of Transactions

Origin of Transactions - Source Documents and Vouchers, Preparation of Vouchers

Accounting Equation - Meaning and Analysis of transactions using Accounting Equation. Rules of Debit and Credit: For Assets, for Liabilities, for Capital, for Revenue, and for Expense. Double Entry Book Keeping, Books of Original Entry, Meaning, Format and Recording of entries; Journal, Special Purpose Books: Meaning, Utility, Cash Book - Simple Cashbook with Bank column and Petty cashbook. Purchase Book, Sales Book, Purchase Returns Book, Sales Returns Book, Bills Receivable Book and Bills Payable Book. Ledger - Meaning, Utility, Format, Posting from Journal, Cashbook and other Special Purpose Books, Balancing of accounts. Bank Reconciliation Statement: Meaning, Need and Preparation with amended cash book.

Trial Balance and Rectification of Errors

Trial Balance: Meaning, Objectives and Preparation.

Errors: Types of Errors, Errors affecting Trial Balance and Errors not affecting Trial Balance. Detection and Rectification of Errors, effect on profit and loss A/c, Suspense Account - meaning, Utility, Preparation and Treatment of Suspense Account Balance.

Depreciation, Provisions and Reserves

Depreciation: Meaning and Need for charging depreciation, Factors affecting depreciation, Methods of depreciation - Straight Line method, Written Down Value Method (excluding change in method), Method of recording depreciation: By charging to asset account, By creating provision for depreciation/accumulated depreciation account. Asset Disposal Account. Provisions and Reserves: Meaning and Importance, Need for provision for doubtful debts, provision for discount on debtors, Difference between provisions and Reserves. Types of Reserves: Revenue Reserve, Capital Reserve, General Reserve and Specific Reserve

Group –V (Skill 1)

bca-101 Fundamentals of Retail

Retail- Introduction about Retail, Importance of Retailing, service provided by Retailers, overview of Retail Sector, Types of Stores -In store, Non-store retailing and Franchising (including Advantages and Limitations), Online Retailing, Direct Marketing, Retail Strategy- meaning, function, Classification Advantages. Marketing strategies, Technology Strategy.

Retail Environment- Introduction, Parties of Retail Environment (Suppliers, Intermediaries, Competitors, Macro Environment) Forces of Retail Environment (Internal & External Factors). Trends in Indian Retail Industry—Introduction, required skills, Recent Trends in the Indian Retail sector. Factors underlying trends of Modern retail in India.

Store Design Elements

Retail store location & layout—meaning, importance characteristics used in location, trade area selection, consideration. Defining the trade area Reilly model, Huff's Model, out shopping, site evaluation & Selection, neighborhood shopping center, community shopping center, Regional shopping center, and super-regional shopping center & fashion center. Store Design and Layout—introduction, comprehensive store planning types of goods, interior Design elements. Planogram & Shelf layout design.

Group –I (Science)**bca-102 Mathematics****SETS AND FUNCTIONS**

Sets and their representations, Empty set, Finite and Infinite sets, Equal sets, Subsets, Subsets of the set of real numbers especially intervals (with notations), Power set, Universal set, Venn diagrams. Union and intersection of sets, Difference of sets Complement of a set, Properties of Complement sets

Relations and Functions

Ordered pairs, Cartesian product of sets, Number of elements in the Cartesian product of two finite sets, Cartesian product of the reals with itself (upto $R \times R \times R$) definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another, pictorial representation of a function, domain, co-domain and range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs, sum, difference, product and quotients of functions.

Trigonometric Functions

Positive and negative angles, measuring angles in radians and in degrees and conversion from one measure to another Definition of trigonometric functions with the help of unit circle. Truth of the identity $\sin^2 x + \cos^2 x = 1$, for all x . Signs of trigonometric functions and sketch of their graphs. Expressing $\sin(x + y)$ and $\cos(x + y)$ in terms of $\sin x$, $\sin y$, $\cos x$ and $\cos y$. Identities related to $\sin 2x$, $\cos 2x$, $\tan 2x$, $\sin 3x$, $\cos 3x$ and $\tan 3x$. General solution of trigonometric equations of the type $\sin \theta = \sin \alpha$, $\cos \theta = \cos \alpha$ and $\tan \theta = \tan \alpha$. Proofs and simple applications of sine and cosine formulae.

ALGEBRA**Principle of Mathematical Induction**

Process of the proof by induction, motivating the application of the method by looking at natural numbers as the least inductive subset of real numbers, the principle of mathematical induction and simple applications

Complex Numbers and Quadratic Equations

Need for complex numbers, especially $\sqrt{-1}$, to be motivated by inability to solve every quadratic equation. Brief description of algebraic properties of complex numbers, Argand plane and polar representation of complex numbers, Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system, Square-root of a Complex number

Linear Inequalities

Linear inequalities, Algebraic solutions of linear inequalities in one variable and their representation on the number line, graphical solution of linear inequalities in two variables, solution of system of linear inequalities in two variables - graphically

Permutations and Combinations Fundamental principle of counting, Factorial n , Permutations and combinations derivation of formulae and their connections, simple applications,

Binomial Theorem

History, statement and proof of the binomial theorem for positive integral indices, Pascal's triangle, general and middle term in binomial expansion, simple applications

Sequence and Series

Sequence and Series, Arithmetic Progression (A.P.), Arithmetic Mean (A.M.), Geometric Progression (G.P.), general term of a G.P., sum of n terms of a G.P. Arithmetic and geometric series, infinite G.P. and its sum, geometric mean (G.M.). Relation between A.M. and G.M. Sum to n terms of the special series: $\sum n$, $\sum n^2$ and $\sum n^3$

COORDINATE GEOMETRY

Straight Lines

Brief recall of 2-D from earlier classes, shifting of origin, Slope of a line and angle between two lines
Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form. General equation of a line, Equation of family of lines passing through the point of intersection of two lines, Distance of a point from a line,

Conic Sections

Sections of a cone: Circles, ellipse, parabola, hyperbola, a point, a straight line and pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola, Standard equation of a circle

Introduction to Three-dimensional Geometry

Coordinate axes and coordinate planes in three dimensions. Coordinates of a point, Distance between two points and section formula.

Group –II (Computer)

bca-102 Information Practices

COMPUTER FUNDAMENTALS

Introduction to Computer: Definition, Characteristics, Classification of Computers, Analog Computers, Digital Computers, Hybrid Computers, Classifications of computer on the basis of size and speed, different type of computers, generation of computers.

Computer keyboard, pointing devices, mouse, track ball, touch pad, joystick, touch – sensitive screens, pen – based systems, digitizer, data scanning devices, optical recognition systems, bar code readers, optical mark readers, optical scanners, drum scanners, hand scanner, flatbed scanner, web camera, game pad, digital camera.

Hard copy devices: Printer, impact printers, daisy wheel, dot matrix printer, line printer, chain printers, comb printers, non-impact printers, DeskJet, inkjet printers, laser printer, thermal transfer printer, barcode printers.

Computer Display: CRT, LCD, projection displays, plasma display panel, display standard, monochrome display adapter, HGA, CGA, EGA, VGA, MGA, SVGA, XGA, QVGA, SXGA, UXGA

Introduction to memory, classifications, random-access memory, volatile memory, non-volatile memory, flash memory, read-only memory, secondary memory, the cache memory, auxiliary storage memory, memory hierarchy, storage device, magnetic tape, magnetic disk, floppy disk, hard disks, CD, DVD, magneto-optical.

Number system, binary, octal, hexadecimal, addition, subtraction, multiplications, computer code: BCD, ASCII, EBCDIC code, Excess-3 code, gray code, software, User interface, system software, programming software, application software logic gates and Boolean algebra representation and simplifications by kMap.

Computer Viruses: Introduction, history, types of computer viruses, classification of viruses ways to catch a computer virus, symptoms of a computer virus.

Application of computer: Desktop publishing, sports, design and manufacturing research and design, military, robotics, planning and management, marketing, medicine and health care, arts, communications, scientific, education.

Introduction of internet, history, IP, TCP and UDP, application protocol, world wide web, how the web works, web standards, website, overview, types of websites, electronic mail, internet, e-mail header, saved message file extension, messages and mailboxes, introduction to intranet, uses, advantages, disadvantages.

Introduction to data warehouse, components of a data warehouse, different methods of storing data in a data warehouse, advantages of using data warehouse

Group –III (Arts)

bca-102 Sociology

Introducing Sociology

Society and Sociology and Relationship with other Social Sciences

Introducing Society: Individuals and collectivities. Plural Perspectives

Introducing Sociology: Emergence. Nature and Scope. Relationship to other disciplines

Social Groups, Status and Role, Social Stratification, Social Control,

Social Institutions

Family, Marriage and Kinship, Political and Economic Institutions, Religion as a Social Institution,

Education as a Social Institution

Culture and Society

Culture, Values and Norms: Shared, Plural, Contested, Socialization: Conformity, Conflict and the Shaping of Personality

Practical in Sociology: Methods and Techniques

Methods: Participant Observation, Survey, Tools and Techniques: Observation, Interview, Questionnaire, the Significance of Field Work in Sociology

Structure, Process and Stratification

Social Structure, Social Processes: Cooperation, Competition, Conflict, Social Stratification: Class, Caste, Race, Gender

Social Change

Social Change: Types and Dimensions; Causes and Consequences

Social Order: Domination, Authority and Law; Contestation, Crime and Violence

Village, Town and City: Changes in Rural and Urban Society

Environment and Society

Ecology and Society, Environmental Crises and Social Responses

Group –IV (Commerce)**bca-102 Business Studies****Nature and Purpose of Business**

Concept and characteristics of business. Business, profession and employment - Meaning and their distinctive features. Objectives of business - Economic and social, role of profit in business. Classification of business activities: Industry and Commerce. Industry - types: primary, secondary, tertiary - Meaning and sub types. Commerce - trade: types (internal, external, wholesale and retail); and auxiliaries to trade: banking, insurance, transportation, warehousing, communication, and advertising. Business risks - Meaning, nature and causes.

Forms of Business organizations

Sole Proprietorship - meaning, features, merits and limitations. Partnership - Features, types, merits and limitations of partnership and partners, registration of a partnership firm, partnership deed. Type of partners. Hindu Undivided Family Business: features. Cooperative Societies- features, types, merits and limitations. Company: private and public company -features, merits and limitations. Formation of a company- four stages, important document (MOA, AOA, relevances of certificate of incorporation and certificate of commencement.

Starting a business - Basic factors.

Public, Private and Global Enterprises Private sector and public sector enterprises. Forms of public sector enterprises: features, merits and limitations of departmental undertakings, statutory corporation and Government Company. Changing role of public sector enterprises. Global enterprises, Joint ventures, Public Private Partnership – Features

Business Services Banking: Types of bank accounts- savings, current, recurring, fixed deposit and multiple option deposit account. Banking services with particular reference to issue of bank draft, banker's cheque (pay order), RTGS (Real Time Gross Settlement) NEFT (National Electronic Funds Transfer), bank overdraft, cash credits and e- banking. Insurance: principles, concept of life, health, fire and marine insurance. Postal and telecom services: mail (UPC, registered post, parcel, speed post and courier) and other services.

Emerging Modes of Business E-business - scope and benefits, resources required for successful e-business implementation, online transactions, payment mechanism, security and safety of business transactions.

Outsourcing-concept, need and scope of BPO (business process outsourcing) and KPO (knowledge process outsourcing). Smart cards and ATM's meaning and utility

Social Responsibility of Business and Business Ethics

Concept of social responsibility Case for social responsibility Responsibility towards owners, investors, consumers, employees, government and community Environment protection and business

Sources of Business Finance

Concept of business finance Owner's funds - equity shares, preference share, GDR, ADR, IDR and retained earnings. Borrowed funds: debentures and bonds, loan from financial institution, loans from commercial banks, public deposits, trade credit, ICD (inter corporate deposits).

Duration: 3 hours	Max Marks: 50
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Group –V (Skill 2)

bca-102 Introduction of Indian Banking System

Banking Regulation Act-1949: History; Social Control; Banking Regulation Act as applicable to banking companies and public sector banks. Banking Regulation Act as applicable to Co-operative banks Reserve bank of India: structure and organization of banks; Apex banking institutions; Commercial banks; Regional banks; Development banks; State bank of India there Brief History; objectives, functions ,structure and organization. Working and progress.

Regional Rural and Co-operative Banks in India; Functions; Roles of regional rural and co-operative banks in rural India. Progress and performance.

bca-103PC Software

MS-Windows: Introduction to MS Windows, concept of GUI, windows explorer, control panel, accessories, running applications under MS Windows.

Microsoft Word - Word Processing Basics , Features of MS Word ,Typing ,inserting , selecting and deleting Text ,Format Painter ,Find and Replace, Paragraph Attributers , Moving, Copying and Pasting Text,Columns, Drop Caps, Change Case,Page Setting,Illustration, Picture, Shapes, SmartArt, Screenshot,Create Table,Table Design View,Link,Hyperlink,Bookmark,Table Layout,Comments,Header & Footers,Design Tab,Page Setup & Printing,Table of Contents,Footnotes,Mail Merge,Review Tab,View Tab, Document template.

Microsoft Excel - Introducing Excel ,Recognizing Interface Features Unique to Excel , Understanding Workbook Structure ,Navigating through Workbooks ,Making Workbook Selections .The Basics Of Data -Entering Text , Entering Dates & Numbers ,Editing Cell Entries ,Copying & Moving Data, Filling a Series, Managing Workbook Structure - Modifying Workbook & Worksheet Structure, Resizing Worksheet Elements, Hiding Workbook Component ,Workbook Protection, Formatting Cells - Applying Basic Formatting ,Formatting Numbers ,Exploring the Format Cells Dialog Box ,Creating & Applying Cell Styles ,Conditional Formatting, Working With Formulas - Excel Calculations ,Entering Formulas ,Formula Auditing, The Basics Of Functions - Using Basic Functions , Controlling Calculation Options ,Linking Worksheets ,Working With Graphics -Adding Clip Art ,Add an Image From a file, Image Adjustment, Working With Charts - Creating Charts , Modifying Chart Design ,Working with Chart Layout & Format, Working With Hyperlink - Using Bookmark ,External Link ,Sorting, Filtration And Validation - Sorting Data ,Filtering Data ,Data ValidationCustomizing Excel - Customize Tabs, Recording a Macro, Running a Macro.Preparing Files For Distribution - Print Area, Print Titles & Sheet Options, Renaming Sheets & Adding Headers/Footers, Printing Worksheets

Microsoft PowerPoint-Exploring the PowerPoint Interface, Views, Navigation & Keyboard Shortcuts, Setting Options & Saving Files, PowerPoint Design Essentials, Setting Up a New File, Changing Backgrounds, Placeholders & Bullets, Adjusting Placeholders, Adding Headers & Footers, Saving PowerPoint Templates

bca-104C Programming & Data Structures

Overview of C Language: History of C, Character set, C tokens, Identifiers, Keywords, Data types, Variables, Constants, Symbolic Constants, Operators in C, Hierarchy of Operators, Expressions, Type Conversions and Library Functions.

Managing Input and Output Operation: Formatted and Unformatted I/O Functions, Decision making, branching and looping: Decision Making Statements - if Statement, if-else statement, nesting of if-else statements, else-if ladder, switch statement, ?: operator

Looping - while, do-while, for loop, Nested loop, break, continue, and goto statements. Functions: Function Definition, prototyping, types of functions, passing arguments to functions, Nested Functions, Recursive functions.

Arrays: Declaring and Initializing, One Dimensional Arrays, Two Dimensional Arrays, Multi-Dimensional Arrays - Passing arrays to functions. Strings: Declaring and Initializing strings, Operations on strings, Arrays of strings, passing strings to functions. Storage Classes - Automatic, External, Static and Register Variables

Structures-Declaring and Initializing, Nested structure, Array of Structure, Passing Structures to functions, Unions, typedef, enum, Bit fields. Pointers – Declarations, Pointer arithmetic, Pointers and functions, Call by value, Call by reference, Pointers and Arrays, Arrays of Pointers, Pointers and Structures. Meaning of static and dynamic memory allocation, Memory allocation functions.

Data Structures: Arrays, stacks, queues, d-queue, linked lists, single link list, double link list, trees, threaded tree, b-tree, graphs, depth first search, breath first search, kruskal algorithm, prism algorithm, prefix, postfix, infix, in-order, pre-order, post-order, recursive functions.

Sorting: Internal and external sorting, Quick Sort, merge sort, bubble, insertion, selection sorting. Shortest path, travel salesman problem
Searching techniques and merging algorithms

bca-105 Discrete Mathematics

Language of Logic: Proposition, compound proposition, conjunction, disjunction, implications, converse, inverse and contrapositive, bi-conditional statements, tautology, contradiction, contingency, logical equivalence, quantifiers, arguments.

Proof Methods: Vacuous, trivial, direct, indirect by contrapositive and contradiction, constructive & non-constructive proof, counterexample. The division algorithm, divisibility properties (prime numbers & composite numbers) principle of mathematical induction, the second principle of mathematical induction, fundamental theorem of arithmetic. Algorithm correctness: partial correctness, loop invariant, testing the partial correctness of linear and binary search

Graph theory: Graphs, directed, undirected, simple, adjacency & incidence, degree of vertex, sub-graph, complete graph, cycle & wheel graph, bipartite & complete bipartite graph, weighted graph, union of simple graphs. Complete graph isomorphic graphs, path, cycles & circuits Eulerian & Hamiltonian graphs. Trees: spanning trees – Kruskal's Algo, finding spanning tree using depth first search, breadth first search.

Sets: definition and types, set operations, partition of set, cardinality, recursive definition of set. Functions: concept, some special functions (polynomial, exponential & Logarithmic, absolute value, floor & ceiling, mod & div functions) properties of functions.

Relations: Boolean matrices, binary relation, adjacency matrix of relation, properties of relations, operations of relations.

bca-106Multimedia Basics

Introduction to Multimedia computer and its peripheral devices, communications and entertainment; framework for multimedia systems: Advantages of MM, system components and the user interface, MM platform, hardware software, commercial tools and standard.

Images and applications, image capture, compression, standards, audio compression and decompression, audio synthesis, MIDI, speech recognition and synthesis, video capturing, compression and decompression, digital video and image compression; jpeg image compression standards; mpeg motion video compression; DVI technology; time-based media representation and delivery

Developing Applications, methodology, design, multimedia object sharing multimedia and multimedia and the law

Application of Multimedia: Intelligent Multimedia system, training and education, kiosks, multimedia in office and home.

Photoshop: Fundamentals, Opening and Importing Images, Resolution, Models and Colour Spaces, Layers. Painting Pixels: The Painting Tools, Erasing, Fills, Type. Selection And Allied Operations: Marquee selection and cropping, Lasso Selection, Paths, Combining and Transforming Selections. Adjustments and Retouching: Tonal Adjustment, Colour Adjustments, Retouching By Hand. Effects and Filters: Blurring and Sharpening, Special Effects and Distortion, Layer Effects and Layer Styles.

Flash: Animation with Interacting, Basic Concepts, Drawing, Lines and Shapes, Strokes and Fill, Shapes and Brushes, Selection, Transformation and Reshaping, Importing Artwork and Manipulating Images. Animation: Animating One Frame at a Time, Motion Tweening , Symbols and Instances , Shape Tweening , Sound.

Actions: Buttons, Button action , Frame Action , Action and Movie Clip Symbols , Actions , Browsers and Networks , Beyond the Basic Actions. Flash CS 6: Interface Elements, Panels, Tools, Layer Folders, Accessibility, Video.