BCA (Unified)
Ordinance, Course Structure & Syllabus

1. **Eligibility For BCA:**
   Candidate should have passed 10+2 examination with Science, Mathematics with at least 50% marks in aggregate and 5% marks relaxation will be given for SC/ST candidate.

2. **Intake :**
   Intake shall be provided in the academic bulletin of each academic year.

3. **Duration:**
   The duration of course is three years consisting of six semesters.

4. **Procedure for Admissions:**
   Admission Procedure is subject to change as per the direction of admission committee.

5. **Medium of Instruction and Examination:**
   The medium of instruction and examination shall be English.

6. **Fee:**
   1) Tuition and other fees: As prescribed by the university from time to time and as given in the academic bulletin of each year.
   2) Refund of fees: Shall be given as in the academic bulletin of each year.

7. **Attendance:**
   Student should require a minimum attendance of 75% in each in theory paper and practical in a semester. In case a student is short of attendance due to illness, participation in sports, extracurricular activities etc the following rules shall apply.
   A shortage of up 25% can be considered by the Vice – Chancellor on the specific recommendations of the HOD. Those who fail to put up the minimum attendance as said above will not be permitted for the year end examinations. However under extraordinary circumstances (with due evidence) the Vice- Chancellor may use discretionary power.

8. **Examination:**
   All the theory paper, practicals shall carry 100 marks. Theory paper shall include an external examination for 75 marks and internal (sessional) examination for 25 marks.

A. Theory papers

(I) Semester Examination:

Semester examination shall be conducted by the university as mentioned in the academic calendar of the department. The question paper will be set by the examiners appointed by the Vice-Chancellor based on the recommendations of the Board of studies of the Department. The pattern of question paper will be decided by the University.

(II) Sessional Examinations:

The subject teacher shall conduct three sessional examinations of each theory Paper of 25 marks out of which the average of two best marks will be taken.

If a student does not appear in the sessional examination a re-examination may be given along with the junior batch sessional examination by the subject teacher only after the payment of penalty fees as decided by the University.

No special sessional examinations will be conducted.

B. Practical Examinations:

Practical examination will be conducted by the examiners appointed by the V.C. on the recommendation of the course Committee/Board of Studies. Each student has to maintain a practical record during the course and has to produce it at the time of practical examinations, in form of practical/project file. In case a student fails to appear in a practical examination of any semester (I, II, III, & IV) due to any ground including illness, he/she shall be allowed to appear in the practical examination only after the payment of fees as per University norms with the regular practical examinations(together with the junior batch). In case of the V semester student who fails to appear in a practical examination he/she may be allowed appear in the practical examination with the permission of H.O.D. and after payment of fees as per University norms after the VI semester.

9. Qualifying marks and award of divisions:

The minimum passing mark will be 40% in the aggregate. The minimum pass marks 40% have to be obtained in theory, sessional, practical and dissertation individually. on the basis of percentage of total marks secured in the aggregate of all semesters by a student, he/she will be awarded divisions, as details given below

A) Third division: 40% or more but less than 50%
B) Second division: 50% or more but less than 60%
C) First division: 60% or more but less than 75%
D) First division with distinction: 75% or more.

10. Declaration of results and award of degree:

After completion of the evaluation process, result will be declared by the University. Candidate declared successful may get the provisional degree certificate. Degree will be conferred at the time of convocation or as decided by the V.C.

11. Promotion to the next year

A student shall be promoted to the next year only if he/she passes 50% of the total numbers of theory papers in the year (two semesters). Those who are unable to pass 50% of the theory papers shall get year back.

12. Year Back:

Students are required to clear at least 5 Theory papers per year (2 semesters) for promotion to the next year. The candidate shall have to clear the back paper in maximum two attempt of subsequent exam and then only they will be promoted to the next year.

13. Improvement Examinations:

A candidate may be allowed one chance to improve his /her division maximum up to two papers in next subsequent examinations of the theory paper.

The improvement of division will be allowed for first, second, third, fourth, fifth, semester theory papers. If a student want to improve any of his /her first, second, third, fourth or the fifth semester theory paper . The student has to appear with his/her junior batch (regular examinations) conducted by the department the fee for the improvement.

Note:

a) If a candidate has availed the chance of appearing in the back paper, he/she will not be allowed to appear in an improvement examination in that semester.
b) For improvement of division in a semester examination a candidate can take only one theory paper in any semester.
c) Improvement will not be allowed for practical examination.
d) Improvement examination in a theory paper of any semester shall be allowed only within one academic year after appearing in the fourth semester examination.
e) Improvement will not be allowed in a special back examination.

15. Discontinuation:

Discontinuation may be permitted on medical grounds. Discontinuation may be permitted in the first, second, or the third year, and only for a maximum period of one year. If a student discontinuation in any semester without appearing in the semester examination, the rules of year back shall follow.

16. Scrutiny:

Scrutiny will be allowed to the student in two papers on payment of prescribed fees as decided by the University with the permission of V.C. provided the student applies for the same within one month of declaration of result of particular semester.

17. Restructuring of course structure:

The design course structure and content of the syllabi of BCA will be decided by the Board of Studies from time to time. The BOS may add a new theory paper or practical or delete an already existing theory paper or practical from the course if necessary based on the need of the time and trends in science.

18. Amendment:

The rules described in the ordinance will be applicable for minimum period of three years. After this period the rules may be reconsidered by the appropriate bodies of the Universities if necessary. The BOS shall be the primary body which frames the ordinance.

19. The course structure and scheme of examination shall be as follows.

BCA (Unified) Course Structure

Semester-Ist

Paper Code	Paper Name	Internal	External	Total
1871	Computer Fundamental & Office Automation	25	75	100
1872	Programming Principle & Algorithm	25	75	100
1873	Principle of Management	25	75	100
1874	Business Communication	25	75	100
1875	Mathematics-I	25	75	100
10876	Computer Practical Based on Office Automation	-	50	50
10877	Computer Laboratory & Practical work of Programming Principle & Algorithm	-	50	50
			Total	600

Semester-IInd

Paper Code	Paper Name	Internal	External	Total
1876	'C' Programming	25	75	100
1877	Digital Electronics & Computer Organization	25	75	100
1878	Organization Behavior	25	75	100
1879	Financial Accounting & Management	25	75	100
1880	Mathematics-II	25	75	100
10881	Computer Laboratory & Practical Work of 'C' Programming	-	100	100
			Total	600

Semester-IIIrd

Paper Code	Paper Name	Internal	External	Total
2871	Object Oriented Programming using C++	25	75	100
2872	Data Structure using C & C++	25	75	100
2873	Computer Architecture & Assembly Language	25	75	100
2874	Business Economics	25	75	100
2875	Element of Statistics	25	75	100
20876	Computer Laboratory & Practical work on OOPS	-	50	50
20877	Computer Laboratory & Practical Work of Data Structure	-	50	50
			Total	600

Semester-IVth

Paper Code	Paper Name	Internal	External	Total
2876	Computer Graphics & Multimedia Application	25	75	100
2877	Operating System	25	75	100

2878	Software Engineering	25	75	100
2879	Optimization Technique	25	75	100
2880	Mathematics-III	25	75	100
20881	Computer Laboratory & Practical work of Computer Graphics & Multimedia Application	-	100	100
			Total	600

Semester-Vth

Paper Code	**Paper Name**	**Internal**	**External**	**Total**
3871	Introduction to DBMS	25	75	100
3872	Java Programming & Dynamic Webpage Design	25	75	100
3873	Computer Network	25	75	100
3874	Numerical Methods	25	75	100
30875	Minor Project	-	50	50
30876	Viva-Voce on Minor Project	-	50	50
30877	Computer Laboratory & Practical work of DBMS	-	50	50
30878	Computer Laboratory & Practical work of Java Programming & Dynamic Webpage Design	-	50	50
			Total	600

Semester-VIth

Paper Code	**Paper Name**	**Internal**	**External**	**Total**
3876	Computer Network Security	25	75	100
3877	Information System: Analysis Design & Implementation	25	75	100
3878	E-Commerce	25	75	100
3879	Knowledge Management	25	75	100
30880	Major Project	-	300	300
30881	Presentation/Seminar based on Major Project	-	100	100
30882	Viva-Voce	-	100	100
			Total	900

BCA First Semester

Computer Fundamental & Office Automation
Paper Code-1871

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Introduction to Computers Introduction, Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages). Data Organization, Drives, Files, Directories. Types of Memory (Primary And Secondary) RAM, ROM, PROM, EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive) I/O Devices (Scanners, Plotters, LCD, Plasma Display) Number Systems Introduction to Binary, Octal, Hexadecimal system Conversion, Simple Addition, Subtraction, Multiplication

UNIT-II
Algorithm and Flowcharts Algorithm: Definition, Characteristics, Advantages and disadvantages, Examples Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages, Examples

UNIT-III
Operating System and Services in O.S. Dos - History, Files and Directories, Internal and External Commands, Batch Files, Types of Operating System.

UNIT-IV
Windows Operating Environment Features of MS — Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush.

UNIT-V
Editors and Word Processors Basic Concepts, Examples: MS-Word, Introduction to desktop publishing.

UNIT-VI
Spreadsheets and Database packages Purpose, usage, command, MS-Excel, Creation of files in MS-Access, Switching between application, MS-PowerPoint.

Reference:
1. Fundamental of Computers — By V. Rajaraman B.P.B. Publications
2. Fundamental of Computers — By P.K. Sinha
3. Computer Today- By Suresh Basandra
4. Unix Concepts and Application — By Sumitabha Das
5. MS-Office 2000(For Windows) — By Steve Sagman
6. Computer Networks — By Tennenbum Tata MacGrow Hill Publication

BCA First Semester

Programming Principle & Algorithm
Paper Code-1872

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Introduction to 'C' Language History, Structures of 'C' Programming, Function as building blocks. Language Fundamentals Character set, C Tokens, Keywords, Identifiers, Variables, Constant, Data Types, Comments.

UNIT-II
Operators Types of operators, Precedence and Associativity, Expression, Statement and types of statements Build in Operators and function Console based I/O and related built in I/O function: printf(), scanf(), getch(), getchar(), putchar(); Concept of header files, Preprocessor directives: #include, #define.

UNIT-III
Control structures Decision making structures: If, If-else, Nested If-else, Switch; Loop Control structures: While, Do-while, for, Nested for loop; Other statements: break, continue, goto, exit.

UNIT-IV
Introduction to problem solving Concept: problem solving, Problem solving techniques (Trail & Error, Brain Stroming, Divide & Conquer) Steps in problem solving (Define Problem, Analyze Problem, Explore Solution) Algorithms and Flowcharts (Definitions, Symbols), Characteristics of an algorithm Conditionals in pseudo-code, Loops in pseudo code Time complexity: Big-Oh notation, efficiency Simple Examples: Algorithms and flowcharts (Real Life Examples)

UNIT-V
Simple Arithmetic Problems Addition / Multiplication of integers, Determining if a number is +ve / -ve / even / odd, Maximum of 2 numbers, 3 numbers, Sum of first n numbers, given n numbers, Integer division, Digit reversing, Table generation for n, ab, Factorial, sine series, cosine series, nCr , Pascal Triangle, Prime number, Factors of a number, Other problems such as Perfect number, GCD numbers etc (Write algorithms and draw flowchart), Swapping UNIT-VI Functions Basic types of function, Declaration and definition, Function call, Types of function, Parameter passing, Call by value, Call by reference, Scope of variable, Storage classes, Recursion.

Reference:
1. Let us C-Yashwant Kanetkar.
2. Programming in C-Balguruswamy
3. The C programming Lang., Pearson Ecl - Dennis Ritchie
4. Structured programming approach using C- Forouzah & Ceilber Thomson learning publication.
5. Pointers in C — Yashwant Kanetkar
6. How to solve it by Computer — R.G Dromy
7. Peter Norton's Introduction to Computers — Tata MGHiII

BCA First Semester

Principle of Management
Paper Code-1873

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Nature of Management: Meaning, Defination, it's nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management-Administration-Organization, Management Skills, Levels of Management.

UNIT-II
Evolution of Management Thought: Contribution of F.W.Taylor, Henri Fayol, Elton Mayo, Chester Barhard & Peter Drucker to the management thought. Business Ethics & Social Responsibility: Concept, Shift to Ethics, Tools of Ethics.

UNIT-III
Functions of Management: Part-I Planning — Meaning- Need & Importance, types, Process of Planning, Barriers to Effective Planning, levels — advantages & limitations. Forecasting- Need & Techniques Decision making-Types - Process of rational decision making & techniques of decision making Organizing — Elements of organizing & processes: Types of organizations, Delegation of authority — Need, difficulties Delegation — Decentralization Staffing — Meaning & Importance Direction — Nature — Principles Communication — Types & Importance

UNIT-IV
Functions of Management: Part-II Motivation — Importance — theories Leadership — Meaning — styles, qualities & function of leader Controlling - Need, Nature, importance Process & Techniques, Total Quality Management Coordination — Need — Importance

UNIT - V
Management of Change: Models for Change, Force for Change, Need for Change, Alternative Change Techniques, New Trends in Organization Change, Stress Management. UNIT-VI Strategic Management Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist, Relevance of Strategic Management and its Benefits, Strategic Management in India

Reference:

1. Essential of Management — Horold Koontz and Iteinz Weibrich- McGrawhills International
2. Management Theory & Practice — J.N.Chandan
3. Essential of Business Administration — K.Aswathapa, Himalaya Publishing House
4. Principles & practice of management — Dr. L.M.Parasad, Sultan Chand & Sons — New Delhi
5. Business Organization & Management — Dr. Y.K.Bhushan
6. Management Concept and Strategies By J.S. Chandan, Vikas Publishing
7. Principles of Management, By Tripathi, Reddy Tata McGraw Hill
8. Business organization and Management by Talloo by Tata McGraw Hill
9. Business Environment and Policy — A book on Strategic Management/ Corporate Planning by Francis Cherunilam Himalaya Publishing House 2001 Edition

BCA First Semester

Business Communication
Paper Code-1874

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Means of Communication: Meaning and Definition — Process — Functions — Objectives — Importance — Essentials of good communication — Communication barriers, 7C's of Communication

UNIT-II
Types of Communication: Oral Communication: Meaning, nature and scope — Principle of effective oral communication — Techniques of effective speech — Media of oral communication (Face-to-face conversation — Teleconferences — Press Conference — Demonstration — Radio Recording — Dictaphone — Meetings — Rumour — Demonstration and Dramatisation — Public address system — Grapevine — Group Discussion — Oral report — Closed circuit TV). The art of listening — Principles of good listening.

UNIT-III
Written Communication Purpose of writing, Clarity in Writing, Pricinciple of Effective writing, Writing Techniques, Electronic Writing Process.

UNIT-IV
Business Letters & Reports: Need and functions of business letters — Planning & layout of business letter — Kinds of business letters — Essentials of effective correspondence, Purpose, Kind and Objective of Reports, Writing Reports. UNIT-V Drafting of business letters: Enquiries and replies — Placing and fulfilling orders — Complaints and follow-up Sales letters —Circular letters Application for employment and resume

UNIT-VI
Information Technology for Communication: Word Processor — Telex — Facsimile(Fax) — E-mail — Voice mail —Internet — Multimedia —Teleconferencing — Mobile Phone Conversation — Video Conferencing —SMS — Telephone Answering Machine — Advantages and limitations of these types. Topics Prescribed for workshop/skill lab Group Discussion, Mock Interview, Decision Making in a Group

Reference:

1. Business Communication — K.K.Sinha — Galgotia Publishing Company, New Delhi.
2. Media and Communication Management — C.S. Rayudu — Hikalaya Publishing House, Bombay.
3. Essentials of Business Communication — Rajendra Pal and J.S. Korlhalli- Sultan Chand & Sons, New Delhi.
4. Business Communication (Principles, Methods and Techniques) Nirmal Singh — Deep &Deep Publications Pvt. Ltd., New Delhi.
5. Business Communication — Dr.S.V.Kadvekar, Prin.Dr.C.N.Rawal and Prof.Ravindra Kothavade-Diamond Publications, Pune.
6. Business Correspondence and Report Writing — R.C. Sharma, Krishna Mohan — Tata McGraw-Hill Publishing Company Limited, New Delhi.
7. Modern Business Correspondence — L.Gartside — The English Language Book Society and Macdonald and Evans Ltd.

BCA First Semester

Mathematics-I
Paper Code-1875

Min. Marks: 30 **Max. Marks: 75**

UNIT-I

DETERMINANTS: Definition, Minors, Cofactors, Properties of Determinants MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, Cramers Rule, Rank of Matrix Dependence of Vectors, Eigen Vectors of a Matrix, Caley-Hamilton Theorem (without proof).

UNIT-II

LIMITS & CONTINUITY: Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities

UNIT-III

DIFFERENTIATION: Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin's & Taylor's), Indeterminate Forms, U Hospitals Rule, Maxima & Minima, Curve Tracing, Successive Differentiation & Liebnitz Theorem.

UNIT-IV

INTEGRATION: Integral as Limit of Sum, Fundamental Theorem of Calculus(without proof.), Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions(definition).

UNIT-V

VECTOR ALGEBRA: Definition of a vector in 2 and 3 Dimensions; Double and Triple Scalar and Vector Product and physical interpretation of area and volume.

Reference:

1. B.S.ter Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998.
2. Shanti Narayan, "Integral Calculus", S. Chand & Company, 1999
3. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th Revised Edition, 2001.
4. Shanti Narayan, "Differential Caluculs", S.Chand & Company, 1998.

BCA First Semester

Practical Examination First
Computer Laboratory & Practical Work of Office Automation
Paper Code-10876

Min. Marks: 20 **Max. Marks: 50**

Practical will be based on Paper Office Automation: Covers UNIT-III, UNIT-IV, UNIT-V and UNIT-VI of Syllabus.

Practical Examination Second
Computer Laboratory & Practical work of Programming Principle & Algorithm
Paper Code-10877

Min. Marks: 20 **Max. Marks: 50**

Practical will be based on Paper Programming Principle & Algorithm: Covers UNIT-III, UNIT-IV, UNIT-V and UNIT-VI of Syllabus.

BCA Second Semester

C Programming
Paper Code-1876

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Arrays Definition, declaration and initialization of one dimensional array; Accessing array elements; Displaying array elements; Sorting arrays; Arrays and function; Two-Dimensional array: Declaration and Initialization, Accessing and Displaying, Memory representation of array [Row Major, Column Major]; Multidimensional array

UNIT-II
Pointers Definition and declaration, Initialization; Indirection operator, address of operator; pointer arithmetic; dynamic memory allocation; arrays and pointers; function and pointers

UNIT-III
Strings Definition, declaration and initialization of strings; standard library function: strlen(), strcpy(), strcat(), strcmp(); Implementation without using standard library functions

UNIT-IV
Structures Definition and declaration; Variables initialization; Accessing fields and structure operations; Nested structures; Union: Definition and declaration; Differentiate between Union and structure

UNIT-V
Introduction C Preprocessor Definition of Preprocessor; Macro substitution directives; File inclusion directives; Conditional compilation Bitwise Operators Bitwise operators; Shift operators; Masks; Bit field UNIT-VI File handling Definition of Files, Opening modes of files; Standard function: fopen(), fclose(), feof(), fseek(), fewind();Using text files: fgetc(), fputc(), fscanf() Command line arguments

References:
1. Let us C-Yashwant Kanetkar.
2. Programming in C-Balguruswamy
3. The C programming Lang., Person Ecl — Dennis Ritchie
4. Structured programming approach using C-Forouzah & Ceilberg Thomson learning publication.

BCA Second Semester

Digital Electronics & Computer Organization
Paper Code-1877

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Logic gates and circuit Gates (OR, AND, NOR, NAND, XOR & XNOR); Demogran's laws; Boolean laws, Circuit designing techniques (SOP, POS, K-Map).

UNIT-II
Combinational Building Blocks Multiplexes; Decoder; Encoder; Adder and Subtracter.

UNIT-III
Memories ROMs, PROMs, EPROMs, RAMs, Hard Disk, Floppy Disk and CD-ROM.

UNIT-IV
Sequential Building Blocks Flip-Flop (RS, D, JK, Master-slave & & T flip-flops); Registers & Shift registers; Counters; Synchronous and Asynchronous Designing method.

UNIT-V
Memory Organization: Basic cell of static and dynamic RAM; Building large memories using chips; Associative memory; Cache memory organization and Virtual memory organization.

References
1. Digital Logic and Computer design (PHI) 1998
2. Computer Architecture (PHI) 1998
3. Digital Electronics (TMH) 1998
4. Computer Organization and Architecture
5. Digital fundamentals (Universal Book Stall) 1998
6. Computer Organization (MC Graw-Hill, Signapore)

BCA Second Semester

Organization Behaviour
Paper Code-1878

Min. Marks: 30 **Max. Marks: 75**

UNIT-I

Fundamentals of Organizational Behaviour Nature, Scope, Definition and Goals of Organizational Behaviour; Fundamental Concepts of Organizational Behaviour; Models of Organizational Behaviour; Emerging aspects of Organizational Behaviour: Meaning Cultural Diversity, Managing the Perception Process

UNIT-II

Perception, Attitude, Values and Motivation Concept, Nature, Process, Importance, Management Behavioural aspect of Perception. Effects of employee attitudes; Personal and Organizational Values; Job Satisfaction; Nature and Importance of Motivation; Achievement Motive; Theories of Work Motivation: Maslow's Need Hierarchy Theory McGregcrs's Theory 'X' and Theory 'Y'

UNIT-III

Personality Definition of Personality, Determinants of Personality; Theories of Personality- Trait and Type Theories, The Big Five Traites, Mytes-Briggs Indicator; Locus of Control, SType A and Type B Assessment of Personality

UNIT-IV

Work Stress Meaning and definition of Stress, Symptoms of Stress; Sources of Stress: Individual Level, Group Level, Organizational Level; Stressors, Extra Organizational Stressors; Effect of Stress — Burnouts; Stress Management — Individual Strategies, Organizational Strategies; Employee Counselling UNIT-V Group Behaviour and Leadership Nature of Group, Types of Groups; Nature and Characteristics of team; Team Building, Effective Teamwork; Nature of Leadership, Leadership Styles; Traits of Effective Leaders

UNIT-VI

Conflict in Organizations Nature of Conflict, Process of Conflict; Levels of Conflict — Intrapersonal, Interpersonal; Sources of Conflict; Effect of Conflict; Conflict Resolution, Meaning and types of Grievances & Process of Grievances Handling.

References:

1. Organizational Behavior Text, Cases and Games- By K.Aswathappa, Himalaya Publishing House, Mumbai, Sixth Edition (2005)
2. Organizational Behavior Human Behavior at Work By J.W. Newstrom, Tata McGraw Hill Publishing Company Limited, New Delhi, 12th Edition (2007)
3. Organizational Behavior By Fred Luthans
4. Organizational Behavior — By Super Robbins
5. Organizational Behavior — Anjali Ghanekar
6. Organizational Behavior Fundamentals, Realities and Challenges By Detra Nelson, James Campbel Quick Thomson Publications
7. Organizational Behavior through Indian Philosophy, By N.M.Mishra, Hikalaya Publication House

BCA Second Semester

Financial Accounting
Paper Code-1879

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Overview - Meaning and Nature of Financial Accounting, Scope of Financial Accounting, Financial Accounting & Management Accounting, Accounting concepts & convention, Accounting standards in India.

UNIT-II
Basics of accounting — Capital & Revenue items, Application of Computer in Accounting Double Entry System, Introduction to Journal, Ledger and Procedure for Recording and Posting, Introduction to Trail Balance, Preparation of Final Account, Profit & Loss Account and related concepts, Balance Sheet and related concept.

UNIT-III
Financial statement analysis: Ratio analysis, Funds flow analysis, concepts, uses, Preparation of funds flow statement, simple problem, Cash flow analysis, Concepts, uses, preparation of cash flow statement, simple problem, Break — even analysis.

UNIT-IV
Definition nature and Objective of Financial Management, Long Term Sources of Finance, Introductory idea about capitalization, Capital Structure, Concept of Cost of Capital, introduction, importance, explicit & implicit cost, Measurement of cost of capital, cost of debt.

UNIT-V
Concept & Components of working Capital. Factors Influencing the Composition of working Capital, Objectives of working Capital Management — Liquidity Vs. Profitability and working capital policies. Theory of working capital: Nature and concepts

UNIT-VI
Cash Management, Inventory Management and Receivables Management.

References:
1. Maheshwari & Maheshwari, "An Introduction to Accountancy", 8th Edition, Vikas Publishing House, 2003
2. Gupta R.L., Gupta V.K., "Principles & Practice of Accountancy", Sultan Chand & Sons, 1999.
3. Khan & Jain, "Financial Accounting"
4. Maheshwari S.N., "Principles of Management Accounting", 11th Edition, Sultan Chand & Sons, 2001.
5. Shukla and Grewal, "Advanced Accounts", 14th Edition, Sultan Chand & Sons.

BCA Second Semester

Mathematics-II
Paper Code-1880

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.

UNIT-II
Relations and Functions Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions, Introduction of Trigonometric, Logarithmic and Exponential Functions.

UNIT-III
PARTIAL ORDER RELATIONS AND LATTICES Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, Glb, lub, Lattices & Algebric Systems, Principle of Duality, Basic Properties, Sublattices, Distributed & Complemented Lattics.

UNIT-IV
Functions of Several Variables Partial Differentiation Change of Variables, Chain Rule, Extrema of Functions of 2 Variables, Euler's Theorem.

UNIT-V
3D Coordinate Geometry: Coordinates in Space, Direction Cosines, Angle Between Two Lines, Projection of Join of Two Points on a Plane, Equations of Plane, Straight Lines, Conditions for a line to lie on a plane, Conditions for Two Lines to be Coplanar, Shortest Distance Between Two Lines, Equations of Sphere, Tangent plane at a point on the sphere.

UNIT-VI
Multiple Integration Double Integral in Cartesian and Polar Coordinates to find Area, Change of Order of Integration, Triple Integral to Find Volume of Simple Shapes in Cartesian Coordinates.

References:
1. Kolman, Busby and Ross, "Discrete Mathematical Structure", PHI, 1996.
2. S.K. Sarkar, "Discrete Maths"; S. Chand & Co., 2000

BCA Second Semester

Practical Examination
Computer Laboratory & Practical Work of 'C' Programming
Paper Code-10881

Min. Marks: 40 **Max. Marks: 100**

Practical will be based on paper 'C' programming: Covers UNIT-I, UNIT-II, UNIT-III, UNIT-IV and UNIT-VI of Syllabus

BCA Third Semester

Object Programming using C++
Paper Code-2871

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Introduction Introducing Object — Oriented Approach, Relating to other paradigms {Functional, Data decomposition}. Basic terms and ideas Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cm, cout, new, delete, operators.

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

UNIT-III
Inheritance and Polymorphism Inheritance, Class hierarchy, derivation — public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parameteric Polymorphism

UNIT-IV
Generic function Template function, function name overloading, Overriding inheritance methods, Run time polymorphism, Multiple Inheritance.

UNIT-V
Files and Exception Handling Streams and files, Namespaces, Exception handling, Generic Classes

References:
1. A.R.Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997.
2. S.B.Lippman & J.Lajoie, " C++ Primer", 3rd Edition, Addison Wesley, 2000.The C programming Lang., Person Eel — Dennis Ritchie
3. R.Lafore, "Object Oriented Programming using C++", Galgotia Publications, 2004
4. D.Parasons, "Object Oriented Programming using C++", BPB Publication.

BCA Third Semester

Data Structure Using C & C++
Paper Code-2872

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Introduction to Data Structure and its Characteristics Array Representation of single and multidimensional arrays; Sprase arrays — lower and upper triangular matrices and Tridiagonal matrices with Vector Representation also.

UNIT-II
Stacks and Queues Introduction and primitive operations on stack; Stack application; Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion between prefix, infix and postfix, introduction and primitive operation on queues, D- queues and priority queues.

UNIT-III
Lists Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion searching, two way lists and Use of headers

UNIT-IV
Trees Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion; Binary Search Tree

UNIT-V
B-Trees Introduction, The invention of B-Tree; Statement of the problem; Indexing with binary search trees; a better approach to tree indexes; B-Trees; working up from the bottom; Example for creating a B-Tree

UNIT-VI
Sorting Techniques; Insertion sort, selection sort, merge sort, heap sort, searching Techniques: linear search, binary search and hashing

References:

1. E.Horowiz and S.Sahani, " Fundamentals of Data structures", Galgotia Book source Pvt. Ltd., 2003
2. R.S.Salaria, " Data Structures & Algorithms" , Khanna Book Pblishing Co. (P) Ltd..,2002
3. Y.Langsam et. Al., " Data Structures using C and C++" , PHI, 1999

BCA Third Semester

Computer Architecture & Assembly Language
Paper Code-2873

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Basic computer organization and design, Instructions and instruction codes, Timing and control/ instruction cycle, Register/ Types of register/ general purpose & special purpose registers/ index registers. Register transfer and micro operations/ register transfer instructions, Memory and memory function, Bus/ Data transfer instructions, Arithmetic logic micro-operations/ shift micro-operations, Input/ Output and interrupts, Memory reference instructions, Memory interfacing memory/ Cache memory.

UNIT-II
Central Processing Unit General Register Organization/ stacks organizations instruction formats, addressing modes, Data transfer and manipulation. Program control reduced computer, pipeline/ RISC/ CISC pipeline vector processing/ array processing. Arithmetic Algorithms: Integer multiplication using shift and add, Booth's algorithm, Integer division, Floating-point representations.

UNIT-III
Computer Arithmetic Addition, subtraction and multiplication algorithms, divisor algorithms. Floating point, arithmetic operations, decimal arithmetic operations, decimal arithmetic operations.

UNIT-IV
Input — Output Organization Peripheral devices, Input/output interface, ALU Asynchronous Data transfer, mode of transfer, priority interrupts, Direct memory Address (DMA), Input/ Output processor (IOP), serial communication.

UNIT-V
Evaluation of Microprocessor Overview of Intel 8085 to Intel Pentium processors Basic microprocessors, architecture and interface, internal architecture, external architecture memory and input/ output interface.

UNIT-VI
Assembly language, Assembler, Assembly level instructions, macro, use of macros in I/C instructions, program loops, programming arithmetic and logic subroutines, Input-Output programming.

References:
1. Leventhal, L.A, "Introduction to Microprocessors", Prentice Hall of India
2. Mathur, A.P., "Introduction to Microprocessors" , Tata McGraw Hill
3. Rao,P.V.S., "Prospective in Computer Architechture" , Prentice Hall of India

BCA Third Semester

Business Economics
Paper Code-2874

Min. Marks: 30 **Max. Marks: 75**

UNIT-I

The Scope and Method of Economics, the Economic Problem: Scarity & Choice, The Price Mechanism, Demand & Supply Equilibrium: The Concept of Elasticity and it's Applications. The Production Process: output decisions — Revenues Costs and Profit Maximisation Laws of returns & Returns to Scale: Economics and Diseconomies of scale.

UNIT-II

Market Structure: Equilibrium of a firm and Price, Output Determination under Perfect Competition Monopoly, Monoplastic Competition & Oligopoly

UNIT-III

Macro Economic Concerns Inflalation, Unemployment, Trade-Cycles, Circular Flow upto Four Sector Economy, Government in the Macro Economy: Fiscal Policy, Monetary Policy, Measuring national Income and Output

UNIT-IV

The World Economy — WTO, Globalisation, MNC's, Outsourcing, Foreign Capital in India, Trips, Groups of Twenty (G-20), Issues of dumping, Export-Import Policy 2004-2009

References:

1. Ahuja H.L., "Business Economics",S.Chand & Co., New Delhi, 2001
2. Ferfuson P.R., Rothchild, R and Fergusen G.J."Business Economics" Mac-millan, Hampshire, 1993
3. Karl E.Case & Ray C. fair , "Principles of Economics" , Pearson Education , Asia, 2000
4. Nellis, Joseph, Parker David, " The Essence of Business Economics",Prentice Hall, New Delhi, 1992.

Elements of Statistics
Paper Code-2875

Min. Marks: 30 **Max. Marks: 75**

UNIT-I

Population, Sample and Data Condensation Definition and scope of statistics, concept of population and simple with Illustration, Raw data, attributes and variables, classification, frequency distribution, Cumulative frequency distribution.

UNIT-II

Measures of Central Tendency Concept of central Tendency, requirements of a good measures of central tendency, Arithmetic mean, Median, Mode, Harmonic Mean, Geometric mean for grouped and ungrouped data.

UNIT-III

Measures of Dispersion: Concept of dispersion, Absolute and relative measure of dispersion, range variance, Standard deviation, Coefficient of variation.

UNIT-IV

Permutations and Combinations Permutations of 'n' dissimilar objects taken 'r' at a time (with or without repetitions). nP, = n!/(n-r) !(without proof). Combinations of 'r' objects taken from `n' objects. nCr = n!/(r!(n-r)!) (without proof) . Simple examples, Applications.

UNIT-V

Sample space, Events and Probability Experiments and random experiments, Ideas of deterministic and non-deterministic experiments; Definition of sample space, discrete sample space, events; Types of events, Union and intersections of two or more events, mutually exclusive events, Complementary event, Exhaustive event; Simple examples. Classical definition of probability, Addition theorem of probability without Proof (upto three events are expected). Definition of conditional probability Definition of independence of two events, simple numerical problems.

UNIT-VI

Statistical Quality Control Introduction, control limits, specification limits, tolerance limits, process and product control; Control charts for X and R; Control charts for number of defective {n-p chart},control charts for number of defects { c - chart}

References:

1. S.0 Gupta - Fundamentals of statistics - Sultan chand & sons , Delhi.
2. D.N.Elhance - Fundamentals of statistics - Kitab Mahal, Allahabad.
3. Montogomery D.C. — Statistical Quality Control - John Welly and Sons
4. Goon, Gupta And Dasgupta - Fundamentals of statistics - The world press private ltd. , Kolkata.
5. Hogg R.V. and Craig R.G.•— Introduction to mathematical statistics Ed 4 { 1989} — Macmillan Pub. Co. Newyork.
6. Gupta S.P. — Statistical Methods , Pub — Sultan Chand and sons New Delhi

BCA Third Semester

Practical Examination First
Computer Laboratory & Practical work of OOPS
Paper Code-20876

Min. Marks: 20 **Max. Marks: 50**

Practical will be based on Paper Object Oriented Programming: Covers UNIT-II, UNIT-III, UNIT-IV and UNIT-V of Syllabus

Practical Examination Second
Computer Laboratory & Practical work of DS
Paper Code-20877

Min. Marks: 20 **Max. Marks: 50**

Practical will be based on Paper Data Structure: Covers UNIT-III, UNIT-IV, UNIT-V and UNIT-VI of Syllabus

BCA Fourth Semester

Computer Graphics & Multimedia Application
Paper Code-2876

Min. Marks: 30 **Max. Marks: 75**

UNIT-I

Introduction: The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Application Development of Hardware and software for computer Graphics, Conceptual Framework for Interactive Graphics, Overview, Scan: Converting Lines, Scan Converting Circles, Scan Converting Ellipses.

UNIT-II

Hardcopy Technologies, Display Technologies, Raster-Scan Display System, Video Controller, Random-Scan Display processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc, Clipping Southland- Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm

UNIT-III

Geometrical Transformation 2D Transformation, Homogeneous Coordinates and Matrix Representation of 2D Transformations, composition of 2D Transformations, the Window-to-Viewport Transformations, Introduction to 3D Transformations Matrix.

UNIT-IV

Representing Curves & Surfaces Polygon meshes parametric, Cubic Curves, Quadric Surface; Solid Modeling Representing Solids, Regularized Boolean Set Operation primitive Instancing Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Solid Geometry Comparison of Representations.

UNIT-V

Introductory Concepts: Multimedia Definition, CD-ROM and the multimedia highway, Computer Animation (Design, types of animation, using different functions)

UNIT-VI

Uses of Multimedia, Introduction to making multimedia — The stage of Project, hardware & software requirements to make good multimedia skills and Training opportunities in Multimedia Motivation for Multimedia usage

References:

1. L Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles& practice,2000.
2. D.J. Gibbs & D.C. Tsichritzs: Multimedia programming Object Environment& Frame work,2000
3. Ralf Skinmeiz and Klana Naharstedt, Multimedia: computing, Communication and Applications, pearson, 2001

4, D.Haran & Baker “Computer Graphics” Prentice Hall of India, 1986

BCA Fourth Semester

Operating System
Paper Code-2877

Min. Marks: 30 **Max. Marks: 75**

UNIT-I

Introduction, What is an operating system, Simple Batch Systems, Multi-programmed Batch systems, Time- Sharing Systems, Personal — Computer Systems, Parallel systems, Distributed systems, Real- Time Systems. Memory Management: Background, Logical versus physical Address space, swapping, Contiguous allocation, Paging, Segmentation Virtual Memory: Demand Paging, Page Replacement, Page- replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations

UNIT-II

Processes: Process Concept, Process Scheduling, Operation on Processes CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple —Processor Scheduling. Process Synchronization: Background, the Critical — Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization

UNIT-III

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock

UNIT-IV

Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap- Space Management, Disk Reliability

UNIT-V

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

References:

1. Silbersachatz and Galvin, "Operating System Concepts", Person, 5th Ed. 2001
2. Madnick E., Donovan J., " Operating Systems:,Tata McGraw Hi11,2001
3. Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000

BCA Fourth Semester

Software Engineering
Paper Code-2878

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Software Engineering: Definition and paradigms, A generic view of software engineering.

UNIT-II
Requirements Analysis: Statement of system scope, isolation of top level processes and entitles and their allocation to physical elements, refinement and review. Analyzing a problem, creating a software specification document, review for correctness, consistency, and completeness.

UNIT-III
Designing Software Solutions: Refining the software Specification; Application of fundamental design concept for data, architectural and procedural designs using software blue print methodology and object oriented design paradigm; Creating design document: Review of conformance to software requirements and quality.

UNIT-IV
Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style and review of correctness and readability.

UNIT-V
Software Maintenance: Maintenance as part of software evaluation, reasons for maintenance, types of maintenance (Perceptive, adoptive, corrective), designing for maintainability, techniques for maintenance.

UNIT-VI
Comprehensive examples using available software platforms/case tools, Configuration Management.

References:
1. K.K.Aggarwal & Yogesh Singh "Software engineering", 2nd Ed., New Age International 2005.
2. I.Sommerville, "Software Engineering", Addison Wesley, 2002.
3. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach" John Wiley & Sons.

BCA Fourth Semester

Optimization Techniques
Paper Code-2879

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Linear programming Central Problem of linear Programming various definitions included Statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem, tic-tac problem, and its solution. Assignment problem and its solution. Graphical Method Formulation, Linear Programming Problem.

UNIT-II
Queuing Theory Characteristics of queuing system, Classification of Queuing Model Single Channel Queuing Theory, Generalization of steady state M/M/1 queuing models (Model-I, Model-II).

UNIT-III
Replacement Theory Replacement of item that deteriorates replacement of items that fail. Group replacement and individual replacement.

UNIT-IV
Inventory Theory Cost involved in inventory problem- single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite.

UNIT-V
Job Sequencing Introduction, solution of sequencing problem Johnson s algorithm for n jobs through 2 machines

References:
1. Gillet B.E. "Introduction to Operation Research"
2. Taha,H.A. "Operation Research - an introduction"
3. Kanti Swarup "Operation Research"
4. S.D.Sharma "Operation Research"
5. Hira & Gupta "Operation Research"

BCA Fourth Semester

Mathematics-Ill
Paper Code-2880

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Complex Variables: Complex Number System, Algebra of Complex Numbers, Polar Form, Powers and Roots, Functions of Complex Variables, Elementary Functions, Inverse Trigonometric Function.

UNIT-II
Sequence, Series And Convergence: Sequence, Finite and Infinite Sequences, Monotonic Sequence, Bounded Sequence, Limit of a Sequence, Convergence of a Sequence, Series, Partial Sums, Convergent Series, Theorems on Convergence of Series (statement, alternating series, conditional convergent), Leibnitz Test, Limit Comparison Test, Ratio Test, Cauchy's Root Test, Convergence of Binomial and Logarithmic Series, Raabe's Test, Logarithmic Test, Cauchy's Integral Test (without proof)

UNIT-III
Vector Calculus: Differentiation of Vectors, Scalar and Vector Fields, Gradient, Directional Derivatives, Divergence and Curl and their Physical Meaning.

UNIT-IV
Fourier Series: Periodic Functions, Fourier series, Fourier Series of Even and Odd Functions, Half Range Series.

UNIT-V
Ordinary Differential Equations of First Order: Variable- Separable Method, Homogeneous Differential Equations, Exact Differential Equations, Linear Differential Equations, Bernoulli's Differential Equations, Differential Equations of First Order and First Degree by Integrating Factor.

UNIT-VI
Ordinary Differential Equations Of Second Order: Homogenous Differential Equations with Constant Coefficients, Cases of Complex Roots and Repeated Roots, Differential Operator, Solutions by Methods of Direct Formulae for Particular Integrals, Solution by Undetermined Coefficients, Cauchy Differential Equations, (only Real and Distinct Roots) Operator Method for Finding Particular Integrals, (Direct Formulae).

References:
1. A.B. Mathur and V.P. Jaggi, "Advanced Engineering Mathematics", Khanna Publishers, 1999.
2. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Co., 9th Revised Ed.

BCA Fifth Semester

Introduction to DBMS
Paper Code-3871

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Introduction: Characteristics of database approach, data models, DBMS architecture and data independence.

UNIT-II
E-R Modeling: Entity types, Entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub classes; Super classes, inheritance, specialization and generalization.

UNIT-III
File Organization: Indexed sequential access files; implementation using B & B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach implementation and performance.

UNIT-IV
Relational Data Model: Relational model concepts, relational constraints, relational alzebra SQL: SQL queries, programming using SQL.

UNIT-V
EER and ER to relational mapping: Data base design using EER to relational language.

UNIT-VI
Data Normalization: Functional Dependencies, Normal form up to 3rd normal form. Concurrency Control: Transaction processing, locking techniques and associated, database recovery, security and authorization. Recovery Techniques, Database Security

References:

1. T. Abraham Silberschatz, Henry Korth, S.Sudarshan, "Database Systems Concepts", 4in Edition, McGraw Hill, 1997.
2. Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan Kaufmann Publishers, 1993.
3. A.K.Majumdar, P. Bhattacharya, "Database Management Systems", TMH, 1996.
4. Bipin Desai, "An Introduction to database systems", Galgotia Publications, 1991.

BCA Fifth Semester

JAVA Programming & Dynamic Webpage Design
Paper Code-3872

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Java Programming: Data types, control structured, arrays, strings, and vector, classes (inheritance, package, exception handling) multithreaded programming.

UNIT-II
Java applets, AWT controls (Button, Labels, Combo box, list and other Listeners, menu bar) layout manager, string handling (only main functions)

UNIT-III
Networking (datagram socket and TCP/IP based server socket) event handling, JDBC: Introduction, Drivers, Establishing Connection, Connection Pooling.

UNIT-IV
HTML: use of commenting, headers, text styling, images, formatting text with <FONT>, special characters, horizontal rules, line breaks, table, forms, image maps, <META> tags, <FRAMESET> tags, file formats including image formats.

UNIT-V
Java Servlets: Introduction, HTTP Servlet Basics, The Servlet Lifecycle, Retrieving Information, Sending HTML Information, Session Tracking, Database Connectivity

UNIT-VI
Java Server Pages: Introducing Java Server Pages, JSP Overview, Setting Up the JSP Environment, Generating Dynamic Content, Using Custom Tag Libraries and the JSP Standard Tag Library, Processing Input and Output.

References:
1. Patrick Naughton and Herbertz Schildt, "Java-2 The Complete Reference" 199, TMH.
2. Shelley Powers, "Dynamic Web Publishing" 2nd Ed. Techmedia, 1998.
3. Ivor Horton, "Beginning Java-2" SPD Publication
4. Jason Hunter, "Java Servlet Programming" O'Reilly
5. Shelley Powers, "Dynamic Web Publishing" 2nd Ed. Techmedia, 1998
6. Hans Bergsten, "Java Server Pages", 3rd Ed. O'reilly

BCA Fifth Semester

Computer Network
Paper Code-3873

Min. Marks: 30 **Max. Marks: 75**

UNIT-I

Basic Concepts: Components of data communication, distributed processing, standards and organizations. Line configuration, topology, Transmission mode, and categories of networks.
OSI and TCP/IP Models: Layers and their functions, comparison of models.
Digital Transmission: Interfaces and Modems: DTE-DCE Interface, Modems, Cable modems.

UNIT-II

Transmission Media: Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon capacity, comparison of media

UNIT-III

Telephony: Multiplexing, error detection and correction: Many to one, One to many, WDM, TDM, FDM, Circuit switching, packet switching and message switching.
Data link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures.
Point to point controls: Transmission states, PPP layers, LCP, Authentication, NCP.
ISDN: Services, Historical outline, subscriber's access, ISDN Layers and broadcast ISDN.

UNIT-IV

Devices: Repeaters, bridges, gateways, routers, The Network Layer; Design issues, Routing algorithms, Congestion control Algorithms, Quality of service, Internetworking, Network-Layer in the internet.

UNIT-V

Transport and upper layers in OSI Model: Transport layer functions, connection management, functions of session layers, presentation layer and application layer.

References:

1, A.S.Tanenbaum, "Computer Networks"; Pearson Education Asia, 4th Ed. 2003.
2. Behrouz A.Forouzan, "Data Communication and Networking", 3rd Ed. Tata MCGraw Hill, 2004.
3. William stallings, "Data and computer communications", Pearson education Asia, 7th Ed., 2002.

BCA Fifth Semester

Numerical Methods
Paper Code-3874

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Roots of Equations: Bisections Method, False Position Method, Newton's Raphson Method, Rate of convergence of Newton's method.

UNIT-II
Interpolation and Extrapolation : Finite Differences, The operator E, Newton's Forward and Backward Differences, Newton's dividend differences formulae, Lagrange's Interpolation formula for unequal Intervals, Gauss's Interpolation formula, Starling formula, Bessel's formula, Laplace-Everett formula.

UNIT-III
Numerical Differentiation Numerical Integration : Introduction, direct methods, maxima and minima of a tabulated function, General Quadratic formula, Trapezoidal rule, Simpson's One third rule, Simpson's three- eight rule.

UNIT-IV
Solution of Linear Equation: Gauss's Elimination method and Gauss's Siedel iterative method.

UNIT-V
Solution of Differential Equations: Euler's method, Picard's method, Fourth-order Ranga — Kutta method.

References:
1. Scarbourogh, "Numerical Analysis".
2. Gupta & Bose S.C. "Introduction to Numerical Analysis, "Academic Press, Kolkata.
3. S.S.Shashtri, " Numerical Analysis", PHI

BCA Fifth Semester

Minor Project
Paper Code-30875

Min. Marks: **Max. Marks: 50**

Evaluation will be based on Summer Training held after fourth semester and will be conducted by the college/university committee only.

Viva-Voce on Summer Training
Paper Code-30876

Min. Marks: **Max. Marks: 50**

The viva will be conducted based on summer training of four weeks after the end of fourth Semester and will be Conducted by the college committee only.

Practical Examination First
Computer Laboratory & Practical work of DBMS
Paper Code-30877

Min. Marks: 20 **Max. Marks: 50**

Practical will be based on UNIT-1V covering the concept from UNIT-II to UNIT-VI of Syllabus

Practical Examination Second
Practical based on Java Programming & Dynamic Webpage Design
Paper Code-30878

Min. Marks: 20 **Max. Marks: 50**

Practical will be based on Whole Syllabus covering all units

BCA Sixth Semester

Computer Network Security
Paper Code-3876

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Introduction: Attack, Services and Mechanism, Model for Internetwork Security.
Cryptography: Notion of Plain Text, Encryption, Key, Cipher Text, Decryption and cryptanalysis; Public Key Encryption, digital Signatures and Authentication.

UNIT-II
Network Security:Authentication Application: Kerveros, X.509, Directory Authentication Service, Pretty Good Privacy, S/Mime.

UNIT-III
IP security Architecture: Overview, Authentication header, Encapsulating Security Pay Load combining Security Associations, Key Management.

UNIT-IV
Web Security: Requirement, Secure Socket Layer, Transport Layer Security, and Secure Electronic Transactions.

UNIT-V
Network Management Security: Overview of SNMP Architecutre-SMMPVI1 Communication Facility, SNMPV3.

UNIT-VI
System Security: Intruders, Viruses and Relate Threats, Firewall Design Principles. Comprehensive examples using available software platforms/case tools, Configuration Management.

References:
I. W. Stallings, Networks Security Essentials: Application & Standards, Pearson Education, 2000.
2. W.Stallings, Cryptography and Network Security, Principles and Practice, Pearson Education, 2000.

BCA Sixth Semester

Computer System Analysis Design & Implementation
Paper Code-3877

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Overview of System Analysis and Design: Systems Development Life Cycle; concept and Models: requirements determination, logical design, physical design, test planning, implementation, planning and performance evaluation, communication, interviewing, presentation skills; group dynamics; risk and feasibility analysis; group based approaches, JAD, structures walkthroughs, and design and code reviews; prototyping; database design software quality metrics; application categories software package evaluation and acquisition.

UNIT-II
Information Requirement Analysis: Process modeling with physical logical data flow diagrams, data modeling with logical entity relationship diagrams.

UNIT-III
Developing a Proposal: Feasibility study and cost estimation.
System Design: Design of input and control, design of output and control, file design/database design, process, user interface design, prototyping; software constructors; documentation.

UNIT-IV
Application Development Methodologies and CASE tools: Information engineering structured system analysis and design, and object oriented methodologies for application development data modeling, process modeling, user interface design, and prototyping, use of computer aided software engineering (CASE) tools in the analysis design and implementation of information systems.

UNIT-V
Design and Implementation on 00 Platform: Object oriented analysis and design through object modeling technique, object modeling, dynamic modeling and functional object oriented design and object oriented programming systems for implementation, object oriented data bases.

UNIT-VI
Managerial issues in Software Projects: Introduction to software markets; planning of software projects, size and cost estimates; project scheduling; measurement of software quality and productivity, ISO and capability maturity models for organizational growth.

References:

1 . I.T.Haryszkiewycz, Introduction of System Analysis and Design, Pearson Education, (PHI) 1998.
2. V.Rajaraman, Analysis and Design of Information System, Pearson Education, 1991.
3. J.A.Senn, "Analysis and Design of Information Systems"
4. J.K.Whiten., L.D.Bentley, V.M.Beslow, "System Analysis and Design Methods", (Galgotia Publications Pvt.Ltd.) 1994

BCA Sixth Semester

E-Commerce
Paper Code-3878

Min. Marks: 30 **Max. Marks: 75**

UNIT-I

Introduction to E-Commerce: The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic E-commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, E-Commerce in Perspective.

Business Strategy in an Electronic Age: Supply Chains, Porter's Value Chain Model, Inter Organizational Value Chains, Competitive Strategy, Porter's Model, First Mover Advantage Sustainable Competitive Advantage, Competitive Advantage using E-Commerce, Business Strategy, Introduction to Business Strategy, Strategic Implications of IT, Technology, Business Environment, Business Capability, Exiting Business Strategy, Strategy Formulation & Implementation Planning, E-Commerce Implementation, E-Commerce Evaluation.

UNIT-II

Business-to-Business Electronic Commerce: Characteristics of B2B EC, Models of B2B Ec, Procurement Management Using the Buyer's Internal Marketplace, Just in Time Delivery, Other B2B Models, Auctions and Services from Traditional to Internet Based EDI, Intergration with Back-end Information System, The Role of Software Agents for B2B EC, Electronic marketing in B2B, Solutions of B2B EC, Managerial Issues, Electronic Data Interchange (EDI), EDI: The Nuts and Bolts, EDI & Business.

UNIT-III

Internet and Extranet : Automotive Network Exchange, The Largest Extranet, Architecture of the Internet, Intranet and Extranet, Intranet software, Applications of Intranets, Intranet Application Case Studies, Considerations in Intranet Deployment, The Extranets, The structures of Extranets, Extranet products & services, Applications of Extranets, Business Models of Extranet Applications, Managerial Issues.

Electronic Payment Systems : Is SET a failure, Electronic Payments & Protocols, Security Schemes in Electronic payment systems, Electronic Credit card system on the Internet, Electronic Fund transfer and Debit cards on the Internet, Stored — value Cards and E- Cash, Electronic Check Systems, Prospect of Electronic Payment Systems, Managerial Issues.

UNIT-IV

Public Policy: From Legal Issues to Privacy : EC- Related Legal Incidents, Legal Incidents, Ethical & Other Public Policy Issues, Protecting Privacy, Protecting Intellectual Property, Free speech, Internet Indecency & Censorship, Taxation & Encryption Policies, Other Legal Issues: Contracts, Gambling & More, Consumer & Seller Protection In EC.

UNIT-V

Infrastructure For EC : It takes more than Technology, A Network Of Networks, Internet Protocols, Web- Based client/ Server, Internet Security, selling on the web, Chatting on the Web, Multimedia delivery, Analyzing Web Visits, Managerial Issues.

References:

1. David Whiteley, " E-Commerce", Tata McGraw Hill, 2000
2. Eframi Turban, Jae Lee, David King, K. Michale Chung, "Electronic Commerce", Pearson Education, 2000.

BCA Sixth Semester

Knowledge Management
Paper Code-3879

Min. Marks: 30 **Max. Marks: 75**

UNIT-I
Business Intelligence and Business Decisions: Modeling Decision Process; Decision support systems; Group decision support and Groupware Technologies.

UNIT-II
Executive Information and support Systems: Business Expert System and AI, OLTO & OLAP; Data Warehousing; Data Marts, Data Warehouse architecture; Tools for data warehousing.

UNIT-III
Multi- Dimensional analysis: Data mining and knowledge discovery; Data mining and Techniques; Data mining of Advance Databases.

UNIT-IV
Knowledge Management Systems: Concept and Structure KM systems, techniques of knowledge management appreciation & limitation.

References:
1. Decision support system, EIS, 2000
2. W.H.Inmon, "Building Data Warehousing", Willey, 1998.
3. Han, Jiawei, Kamber, Michelinal, " Data Mining Concepts & Techniques", Harcourt India, 2001

BCA Sixth Semester

Major Project
Paper Code-30880

Min. Marks: **Max. Marks: 300**

Evaluation will be based on semester and will be Conducted by the university/ college committee only.

Presentation / Seminar based on Major Project
Paper Code-30881

Min. Marks: **Max. Marks: 100**

Presentation or Seminar will be based on Project Work & the evaluation of presentation or seminar will be done by the committee only

Viva-Voce based on Major Project
Paper Code-30882

Min. Marks: **Max. Marks: 100**

Viva-Voce will be based on Project Work & the evaluation of presentation or seminar will be done by the committee only