SCHEME OF EXAMINATION

&

DETAILED SYLLABUS

for

BACHELOR OF COMPUTER APPLICATIONS (BCA) DEGREE

GURU GOBIND SINGH
INDRAPRASTHA UNIVERSITY
KASHMERE GATE, DELHI

Bachelor of Computer Applications

FIRST SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
BCA 101	Mathematics – I	3	1	4
BCA 103	Business Communication	3	0	3
BCA 105	Programming with C	3	1	4
BCA 107	Fundamentals of Information Technology	3	1	4
BCA 109	Basics of Physics	3	1	4
PRACTICALS				
BCA 151	Practical – I	0	12	6
BCA 153*	General Proficiency – I	2	0	2
	Total	**17**	**16**	**27**

***NUES**

Bachelor of Computer Applications

SECOND SEMESTER EXAMINATION

Code No.	**Paper**	**L**	**T/P**	**Credits**
BCA 102	Mathematics – II	3	1	4
BCA 104	Business Organization & Management	3	0	3
BCA 106	Digital Electronics	3	1	4
BCA 108	Data Structures using C	3	1	4
BCA 110	Database Management Systems	3	1	4
PRACTICALS				
BCA 152	Practical – II	0	12	6
BCA 154*	General Proficiency – II	2	0	2
	Total	**17**	**16**	**27**

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Bachelor of Computer Applications

THIRD SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
BCA 201	Mathematics – III	3	1	4
BCA 203	Computer Architecture	3	1	4
BCA 205	Front End Design Tools	3	1	4
BCA 207	Financial Accounting	3	0	3
BCA 209	Object Oriented Programming	3	1	4
PRACTICALS				
BCA 251	Practical – III	0	12	6
BCA 253*	General Proficiency – III	2	0	2
	Total	**17**	**16**	**27**

***NUES**

Bachelor of Computer Applications

FOURTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
BCA 202	Mathematics – IV	3	1	4
BCA 204	Software Engineering	3	1	4
BCA 206	Java Programming & Website Design	3	1	4
BCA 208	Operating Systems	3	1	4
BCA 210	Business Economics	3	1	4
PRACTICALS				
BCA 252	Practical – IV	0	8	4
BCA 254*	General Proficiency – IV	2	0	2
	Total	**17**	**13**	**26**

***NUES**
Summer Training will be held for 4 weeks after the end of fourth semester.
Viva-Voce will be conducted in fifth semester.

Bachelor of Computer Applications

FIFTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credit
BCA 301	Computer Networks	3	1	4
BCA 303	.net Programming	3	1	4
BCA 305	Linux Environment	3	1	4
ELECTIVES (select any One)				
BCA 307	E-Commerce	3	1	4
BCA 309	Design and Analysis of Algorithms	3	1	4
BCA 311	Computer network Security	3	1	4
PRACTICALS				
BCA 351	Practical –V	0	8	4
BCA 353*	Summer Project/Training	0	0	2
BCA 355	Minor Project	-	8	4
BCA 357**	Seminar	2	0	2
	Total	**14**	**20**	**28**

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

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Bachelor of Computer Applications

SIXTH SEMESTER EXAMINATION

Code No.	Paper	L	T/P	Credits
BCA 302	Management Information Systems	3	1	4
BCA 304	Mobile Computing	3	1	4
BCA 306	Computer Graphics & Multimedia Applications	3	1	4
ELECTIVES (select any One)				
BCA 308	Internet Programming	3	1	4
BCA 310	Knowledge Management &New Economy	3	1	4
BCA 312	Artificial Intelligence	3	1	4
PRACTICALS				
BCA 352	Practical –VI	0	8	4
BCA 354	Major Project	-	10	5
	TOTAL	**12**	**22**	**25**

Note:

1. The total number of the credits of the BCA programme = 160.
2. Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn the minimum of 150 credits.

Code No.: BCA 101	**L**	**T**	**C**
Paper: Mathematics -1	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

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)

[No. of Hrs: 11]

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 **[No. of Hrs: 11]**

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, L' Hospitals Rule, Maxima & Minima, Concavity, Asymptote, Singular Points, Curve Tracing, Successive Differentiation & Liebnitz Theorem.

[No. of Hrs: 11]

UNIT IV

INTEGRATION: Integral as Limit of Sum, Riemann Sum, Fundamental Theorem of Calculus, Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Integration of Algebraic and Transcedental Functions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions.

VECTOR ALGEBRA: Definition of a vector in 2 and 3 Dimensions; Double and Triple Scalar and Vector Product and their Applications. **[No. of Hrs: 11]**

Text Books:

1. Kresyig E., "Advanced Engineering Mathematics", 5th Edition, John Wiley & Sons, 1999.

Reference Books:

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

Code No.: BCA 103	**L**	**T**	**C**
Paper: Business Communication	**3**	**0**	**3**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

Concepts and Fundamentals: Meaning of communication, Importance of communication, Communication scope, Process of communication, Communication models and theories, Essentials of good communication - The seven Cs of communication, Factors responsible for growing importance of communication, Channels of communication, Verbal and Non-Verbal communication, Formal and Informal communication, Barriers of communication **[No. of Hrs: 12]**

UNIT-II

Written Communication: Objectives of written Communication, Media of written communication, Merits and demerits of written communication, Planning business messages.

Writing Letters: Business letters, Office memorandum, Good news and bad news letters, Persuasive letters, Sales letters, Letter styles/ layout.

Report Writing**:** Meaning & Definition, Types of report (Business report & Academic report), Format of report, Drafting the report, Layout of the report, Essential requirement of good report writing.

Language Skills**:** Improving command in English, Choice of words, Common problems with verbs, adjectives, adverbs, pronouns, conjunctions, punctuation, prefix, suffix etc.

[No. of Hrs: 12]

UNIT-III

Oral Communication: Principles of effective oral communication, Media of oral communication, Advantages of oral communication, Disadvantages of oral communication, Styles of oral communication.

Interviews**:** Meaning & Purpose, Art of interviewing, Types of interview, Interview styles, Essential Features, Structure, Guidelines for Interviewer, Guide lines for interviewee.

Meetings**:** Definition, Kind of meetings, Advantages and disadvantages of meetings/ committees, Planning and organization of meetings.

Job Application**:** Types of application, Form & Content of an application, drafting the application, Preparation of resume.

Project Presentations: Advantages & Disadvantages, Executive Summary, Charts, Distribution of time (presentation, questions & answers, summing up), Visual presentation, Guidelines for using visual aids, Electronic media (power-point presentation).

Arts of Listening: Good listening for improved communications, Art of listening, Meaning, nature and importance of listening, Principles of good listening, Barriers in listening

[No. of Hrs: 10]

UNIT-IV

Business Negotiation: Definition of negotiation, Factors that can influence negotiation, what skills do we need to negotiate, Negotiation process (preparation, proposals, discussions, bargaining, agreement, implementation). **[No. of Hrs: 10]**

TEXT BOOK:

1. Rayudu, "C.S- Communication", Himalaya Publishing House, 1994.

REFERENCE BOOKS:

1. Reuben Ray, "Communication Today: Understanding Creative Skill", Himalaya Publication House, 2001
2. Malra Treece, "Successful Communication for Business and Management", Prentice Hall, 1997.
3. Bovee & Thill, "Business Communication Today", McGraw Hill, 2003
4. Murphy and Hildebrandt, "Effective of Business Communication", 5th Ed., New York McGraw, 1988.
5. Rajendra Pal and J.S Korlahalli, "Essential of Business Communication", Sultan Chand and sons, 1997.
6. K. K. Sinha, "Business Communication", Galgotia, 2003

Code No.: BCA 105	**L**	**T**	**C**
Paper: Programming with C	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT I

C basics: C character set, Identifiers and keywords, Data types, constants, variables and arrays, declarations, expressions statements, symbolic constants, compound statements, arithmetic operators, unary operators, relational and logical operators, assignment operators, conditional operators, bit operators.

C constructs: If statement, if….else statement, if…..else if….else statement, while statement, do….while statement, for statement, switch statement, nested control statement, break operator, continue operator, comma operator, goto statement. **[No. of Hrs :12]**

UNIT – II

C Functions:Function: declaration, definition & scope, recursion, call by value, call by reference.

Storage Classes: automatic, external (global), static & registers.

Arrays: Arrays, pointers, array & pointer relationship, pointer arithmetic, dynamic memory allocation, pointer to arrays, array of pointers, pointers to functions, array of pointers to functions, Preprocessor directives: #include, #define, macro's with arguments, the operators # and ##, conditional compilations, multiple file programming. **[No. of Hrs :12]**

UNIT – III

Structures:Structures, unions, structure passing to functions, bit fields, file handling [text (ascii), binary], **[No. of Hrs : 10]**

UNIT – IV

Standard library functions from stdio.h, stdlib.h, conio.h, ctype.h, math.h, string.h, process.h **[No. of Hrs : 10]**

TEXT:

1. Yashwant Kanetkar, "Let us C", BPB Publications, 2002

REFERENCES:

1. E. BalaGuruswamy, "Programming in ANSI C", TMH, 1999.
2. Al Kelly and Ira Pohl, "A Book on C", (4th Ed.), Addison Wesley, 1999.
3. B. Kernighan and D. Ritchie, "The ANSI C Programming Language", PHI., 2000.

Code No.: BCA 107	**L**	**T**	**C**
Paper: Fundamentals of Information Technology	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT - I

What are computers? The evolution of computers, Classification of computers.

Block Diagram: Input-output devices, Description of Computer Input Units, Other Input Methods, and Computer Output Units.

Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to construct Memories, Magnetic Hard disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives. **[No. of Hrs: 10]**

UNIT - II

Low level and high level languages, assemblers, compilers, interpreters, linkers, algorithms, flow charting, decision tables, pseudo code, software software concepts: system & application software packages.

Computer Generation & Classifications: First Generation of Computers, The Second Generation, The Generation, The fourth Generation, The Fifth Generation, Classification of Computers, Distributed Computer System, Parallel Computers. **[No. of Hrs: 10]**

UNIT - III

Operating System concepts, different types of operating systems, structure of operating system, DOS/UNIX/LINUX commands, working with Windows, Windows 9x/NT/XP, Data Processing, File Systems and Database Management Systems, different types of Database Management System. **[No. of Hrs: 12]**

UNIT – IV

Basic elements of a communication system, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog Transmission, Network topologies, Network Types (LAN, WAN and MAN), OSI & TCP/IP Model, Internet: Network, Client and Servers, Host & Terminals, TCP/IP, World Wide Web, Hypertext, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Services Providers, Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Intranet. **[No. of Hrs: 12]**

TEXT:

1. Alex Leon & Mathews Leon, "Fundamentals of Information Technology", Leon Techworld, 1999.
2. Vikas Gupta, "Comdex Computer Kit", Wiley Dreamtech, Delhi, 2004
3. P. K. Sinha & Priti Sinha , "Computer Fundamentals", BPB Publications, 1992.

REFERENCES:

1. V. Raja Raman, "Introduction to Computers", PHI, 1998.
2. Alex Leon & Mathews Leon, "Introduction to Computers", Vikas Publishing House, 1999.
3. Norton Peter, "Introduction to computers", 4th Ed., TMH, 2001.

Code No.: BCA 109	**L**	**T**	**C**
Paper: Basics of Physics	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT - I

Law of Motion: Force and Inertia, The law of inertia or Newton's first law of motion, Newton's Second law of Motion, Newton's third law of Motion Equilibrium of concurrent forces, Friction, Lubrication **[No. of Hrs: 11]**

UNIT – II

Work, Energy & Power: Work, Kinetic Energy, Potential Energy, Power, Collisions, Different Forms of Energy, conservation of Energy **[No. of Hrs: 11]**

UNIT - III

Electricity and Electromagnetism: Electric Forces, charges & Fields: Frictional electricity, properties of electric charge, conductors and insulators, coulomb's law, electric field , lines of force.

Electrostatics: Gauss's theorem, applications , electrostatic potential, potential energy, electrostatics of conductors, capacitors and capacitance, effect of dielectrics in capacitors.

Current Electricity: Current, voltage, resistance, ohm's law and resistivity of materials, electrical circuits & Kirchhoff's rule, measurement of voltages, currents and resistance

[No. of Hrs: 11]

UNIT – IV

Thermal and Chemical effects of current: Heating effects, Thermo Electricity, Chemical effects, Magnetic effects of currents, Oersted's discovery, Magnetic field due to current forces on current and the lorentz force. Ampere's circulate law, Solenoid, Electromagnetic Induction: Faraday's experiments, Faradays Law, Lenz's Law and conservation of energy, discussion of Faraday's Law, Electromagnetic induction and Lorentz force, Semiconductors and their property. **[No. of Hrs: 11]**

TEXT BOOK:

1. S. K. Gupta, "Modern ABC of Physics", Vol. I & II, Modern Publishers, 2002.
2. Pradeep, "Fundamental Physics", Class XI, XII, 2000.

REFERENCE BOOKS:

1. Kumar Mittal, "Physics, Part – I", Published by Nageen Publications, Meerut.
2. Kumar Mittal, "Physics, Part - II", Published, By Nageen Publications, Meerut.

Code No. : BCA 151	**L**	**P**	**C**
Paper: Practical – I	**0**	**12**	**6**

Practical will be based on following Papers:

1. Programming with C
2. Fundamentals of Information Technology

Code No. : BCA 153*	**L**	**T**	**C**
Paper: General Proficiency – I	**2**	**0**	**2**

***Non University Examination Scheme (NUES)**

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.

Code No.: BCA 102	**L**	**T**	**C**
Paper: Mathematics II	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

SETS: 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.

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 Trignometric, Logarithmic and Exponential Functions. **[No. of Hrs: 11]**

UNIT-II

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. **[No. of Hrs: 11]**

UNIT-III

FUNCTIONS OF SEVERAL VARIABLES: Partial Differentiation, Change of Variables, Chain Rule, Extrema of Functions of 2 Variables, Euler's Theorem.

3D COORDINATE GEOMETRY: Review of 2D Coordinate Geometry: Equations of Straight Lines, Circle, Ellipse, Parabola, Hyprbola. 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. Equations of Ellipsoid, Paraboloid, Hyperbolid and Cylinder in Cartesian coordinate. **[No. of Hrs: 10]**

UNIT-IV

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. **[No. of Hrs: 12]**

TEXT BOOKS:

1. Kolman, Busby and Ross, "Discrete Mathematical Structure", PHI, 1996.

REFERENCE BOOKS:

1. H.K. Dass, "Advanced Engineering Mathematics"; S.Chand & Co., 9th Revised Ed., 2001.
2. S.K. Sarkar, "Discrete Maths"; S. Chand & Co., 2000

Code No.: BCA 104	**L**	**T**	**C**
Paper: Business Organization & Management	**3**	**0**	**3**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT I

Business –Meaning and Contents, Business as a system, Business and Legal and Economic Environment, Forms of Business Organization (meaning, merits & demerits).

[No. of Hrs.:11]

UNIT II

Management- Management Principles, Henry Fayol's principles of management, Taylor's Scientific Management, Management Process, Basic Functions (in short), Meaning, Nature and Process, Role of Manager.

Organizational Behavior- Need of Understanding human behavior in organizations, Challenges and opportunities for OB, Contributing disciplines to the field of OB, Conceptual Models of OB. **[No. of Hrs.:12]**

UNIT III

Managing Personnel- HRM- Meaning and Functions, Manpower Planning, Job Analysis and Design, Training, Career Planning & Development, Motivation, Compensation Management.

Managing Finance-Concept of Fixed and Working Capital, Main Sources of Finance,

Accounting: Meaning, Users, Budgeting- Meaning, Type of Budgets. **[No. of Hrs.:12]**

UNIT IV

Managing Production- Basic Concepts, Objectives, Elements of Productions, Planning and Control.

Managing Sales and Marketing- Basic Concepts of marketing, Sales Promotions (including Salesmanship) **[No. of Hrs.: 09]**

TEXT BOOKS:

1. Kotler, "Philip, Marketing Management", 9th Ed., Prentice Hall of India, 2000
2. Maheshwari S.N., "Financial Management – Principles and Practice", 6th revised Ed. S. Chand & Sons, 1992.

REFERENCE BOOKS:

1. Chadha N.K., "Human Resource Management- Issues, Case Studies & Experimental Exercises", 2000
2. John W. Newstrom and Keith Davis, "Organisational Behaviour–Human Behaviour at work", 10th Ed., 1997.
3. Koontz and Weihrich, "Management - A global perspective", 10th Ed., McGraw Hill International Ed., 1993.
4. Maheshwari S.N and Maheshwari S.K, "An introduction to Accountancy", 5th Ed, Vikas publishing house Panneerselvam, Production and Operations Managmenet, PHI-1999
5. Robbins, Stephen P., "Organisational Behaviour", 8th Ed.. Prentice Hall of India, 1998.
6. Singh B.P. & Chabbra T.N., Business Organisation and Management Functions, Dhanpat Rai & Co. 2000.

Code No.: BCA 106	**L**	**T**	**C**
Paper: Digital Electronics	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

Boolean Algebra

Basics Laws of Boolean Algebra, Logic Gates, Simplifications of Boolean equations using K-maps, Code Conversion, (Binary, Octal, Hexadecimal), Overview of Gray codes and Excess – 3 codes. **[No. of Hrs: 11]**

UNIT-II

Arithmetic Circuits

Adder, Subtractor, Parallel binary adder/Subtractor, binary multiplier and dibvider.

Combinational Circuits

Multiplexers, De-Multiplexers, decoders, encoders, Design of code converters.

[No. of Hrs: 11]

UNIT-III

Flip-flops

S-R, D, J-K, T, Clocked Flip-flop, Race around condition, Master slave Flip-Flop, Realisation of one flip-flop using other flip-flop.

Shift Registers

Serial-in-serial-out, serial-in-parallel-out, parallel-in-serial-out and parallel-in-parallel-out, Bi-directional shift register. **[No. of Hrs: 11]**

UNIT-IV

Counters

Ripple counter, Synchronous Counter, Modulo Counters, Ring Counter, Twisted Ring Counter.

Memory Devices - RAM, ROM, PAL & PLA **[No. of Hrs: 11]**

TEXT BOOKS

1. Moris Mano, “Digital Logic and Computer Design”, PHI Publications, 2002
2. R. P. Jain, “Modern Digital Electronics”, TMH, 3rd Edition, 2003.

REFERENCES:

1. R.L.Tokheim, “Digital Electronics, Principles and Applications”, Tata McGraw Hill, 1999.
2. W.Gothman, “Digital electronics”, PHI.
3. S. Salivahanan & S. Arivyhgan. “Digital circuits and design”, Vikas Publication, 2001
4. Malvino Leach, "Digital Principles and Application", TMH, 1999.

Code No.: BCA 108	**L**	**T**	**C**
Paper: Data Structures Using C	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

Arrays: Representation of single and multidimensional arrays; sparse arrays - lower and upper triangular matrices and Tri-diagonal matrices

Stacks and Queues: Introduction and primitive operations on stack; Stack application: Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion from infix to postfix.Introduction and primitive operation on queues, D-queues and priority queues.

[No. of Hrs: 13]

UNIT-II

Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion, searching, Two way lists and Use of headers

Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion; **[No. of Hrs: 13]**

UNIT-III

Multilevel indexing and B-Trees: Introduction: The invention of the B-tree; Statement of the problem; Indexing with binary search trees; Multilevel indexing, a better approach to tree indexes; B-trees: working up from the bottom; Example for creating a B-tree.

[No. of Hrs: 10]

UNIT-IV

Sorting Techniques: Insertion sort, selection sort, merge sort, heap sort.

Searching Techniques: linear search, binary search and hashing **[No. of Hrs: 08]**

TEXT:

1. E. Horowitz and S. Sahani, "Fundamentals of Data Structures", Galgotia Booksource Pvt. Ltd, 2003
2. R. S. Salaria, "Data Structure & Algorithms", Khanna Book Publishing Co. (P) Ltd., 2002.

REFERENCES:

1. P. S. Deshpande and O.G. Kakde, "C & Data Structure", Wiley Dreamtech, 1st Edition, 2003.
2. Y. Langsam et. al., "Data Structures using C and C++", PHI, 1999.
3. Schaum's outline series, "Data Structure", TMH, 2002

Code No.: BCA 110	**L**	**T**	**C**
Paper: Database management System	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

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

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, **[No. of Hrs.: 12]**

UNIT – II

File Organization: Indexed sequential access files, implementation using B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach-implementation and performance. **[No. of Hrs.: 10]**

UNIT – III

Relational Data Model: Relational model concepts, relational constraints, relational algebra.
SQL: SQL queries, programming using SQL
EER and ER to relational Mapping: Data base design using EER to relational language.
[No. of Hrs.: 10]

UNIT – IV

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 **[No. of Hrs.: 12]**

TEXT BOOKS:

1 R. Elmarsi and SB Navathe, "Fundamentals of Database Systems", Addison Wesley, 4th Ed., 2004

REFERENCE BOOKS:

1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 4th 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. Battacharya, "Data Base Management Systems', TMH, 1996.
4. Bipin Desai, "An Introduction to database Systems", Galgotia Publications, 1991.

Code No. : BCA 152	**L**	**P**	**C**
Paper: Practical – II	**0**	**12**	**6**

Practical will be based on following Papers:

1. Data Structure with C
2. Database Management System

Code No. : BCA 154*	**L**	**T**	**C**
Paper: General Proficiency – II	**2**	**0**	**2**

***Non University Examination Scheme (NUES)**

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.

Code No.: BCA 201	**L**	**T**	**C**
Paper: Mathematics - III	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

COMPLEX VARIABLES: Complex Number System, Algebra of Complex Numbers, Polar Form, Powers and Roots, Functions of Complex Variables, Elementary Functions, General Power of Functions, Inverse Trignometric and Hyprerbolic Functions.

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, Leibnitz Test, 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)

[No. of Hrs: 13]

UNIT II

VECTOR CALCULUS: Differentiation of Vectors, Scalar and Vector Fields, Gradient, Directional Derivatives, Divergence and Curl and their Physical Meaning, Line Integral and Green's Theorem. **[No. of Hrs: 9]**

UNIT III

FOURIER SERIES: Periodic Functions, Fourier Series, Fourier Series of Even and Odd Functions, Dirichlet Condition, Half Range Series. **[No. of Hrs: 9]**

UNIT IV

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.

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).

[No. of Hrs: 13]

TEXT BOOKS:

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., 2001.

REFERENCE BOOKS:

1. R. K. Jain, SRK Iyengar, "Numerical Methods for Scientific & Engineering Computation", New Age International Pvt. Ltd., 3rd Edition, 1999.

Code No.: BCA 203	**L**	**T**	**C**
Paper: Computer Architecture	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

Register Transfer and Micro-operations:Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic logic shift unit

Basic Computer Organizations and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, **[No. of Hrs: 11]**

UNIT-II

Basic Computer Organizations and Design: Instruction Cycle, Memory-Reference Instructions, Register reference instructions, Input - Output Instructions, Design of Accumulator Logic Shift Unit

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, **[No. of Hrs: 11]**

UNIT-III

Computer Arithmetic: Introduction, Multiplication Algorithms, Division Algorithms, for fixed point-members.

Input-Output Organization: Peripheral Devices, Input-Output Interfaces, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA)

[No. of Hrs: 11]

UNIT-IV

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware

[No. of Hrs: 11]

TEXT BOOKS :

1. Morris Mano, Computer System Architecture, 3rd Edition, Prentice-Hall of India Private Limited, 1999.

REFERENCE BOOKS:

1. WIliam Stallings, Computer Organization and Architecture, 4th Edition, Prentice Hall of India Private Limited, 2001
2. Harry & Jordan, Computer Systems Design & Architecture, Addison Wesley, Delhi, 2000.
3. Malvino, "Digital Computer Electronics: An Introduction to Microcomputers", McGraw Hill, 1993.

Code No.: BCA 205	**L**	**T**	**C**
Paper: Front End Design Tools	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

Visual Basic: Variable Names, Data Types, Assignment, If-then, If-then-else, if then-elseif-else, expression, print statement, arrays, variable declaration, built-in & User defined types, Subroutine and functions, Boolean Operators, Arithmetic Operator, For- .next, do loop, while-wend, procedure/Public, Private and Static & Dim Statement. **[No. of Hrs.: 11]**

UNIT-II

Structure of VB program, Forms & built in controls, Properties and events, Code Module, Scale Modes, Printer Object (Printing text, setting Fonts, graphics), Common dialog Boxes, picture controls, image-controls, send keys, MS-Common Controls, Error Handling, Classes, Control Arrays, MDI, SDI.

File Handling – Text and Binary Files, Files System Orbit Object. **[No. of Hrs.: 11]**

UNIT-III

Database Interface: Review of ANSI SQL, ODBC, Pass through ODBC, DAO, MS-Jet Engine, DB-Engine, Workspaces, Databases, recordsets, Data bound controls, ActiveX controls, ADO, Active X Data controls, RDO

Data view Window, Data Environment Designer, Crystal Report and Data Report Utility Using Visual Basic (VB) for Transaction Management, Concurrency Control, Interfacing with RDBMS, Backend Stored procedure Usage. **[No. of Hrs.: 11]**

UNIT-IV

Help Writing: Building a help, System, Building & Topics File, Labeling the topics, Creating a help project, primary & secondary help window, linking to internet, Adding Multimedia, Using HTML help workshop, content sensitive help, help file.

Overview of COM/DCOM using Windows API Functions, MAPI interface, Microsoft Transaction Server, Visual source safe, VB Script. **[No. of Hrs.: 11]**

TEXT:

1. E. Petroutsos, "Mastering Visual Basic 6.0", BPB Publications, 1998.
2. Perry, Greg, "Teach Yourself Visual Basic 6 in 21 Days", Techmedia, 1998.

REFERENCES:

1. E. Petroutsos, "Mastering Database Programming with Visual Basic 6", BPB Publications, 2000
2. Norton Peter, "Peter Norton's Guide to Visual Basic 6", Techmedia, 1998.

Code No.: BCA 207	**L**	**T**	**C**
Paper: Financial Accounting	**3**	**0**	**3**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

Meaning and Nature of Financial Accounting, Scope of Financial Accounting, Financial Accounting & Management Accounting, Accounting concepts & convention, Accounting standards in India. **[No. of Hrs.: 08]**

UNIT – II

Basis of accounting-cash & accrual, Journalizing transaction, Introduction to Ledger posting and trial balance, Capital and revenue items. Application of computers in accounting, Accounting procedure used for recording cash, Bank and journal transactions using appreciate vouchers, Introduction to ledger accounting, Cash Book, Journal and bank account, Introduction to trial balance, Profit and Loss account and balance sheet.

[No. of Hrs.: 08]

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. **[No. of Hrs.: 08]**

UNIT – IV

Inventory valuation: Objectives, Introduction to FIFO, LIFO & Weighted Average method of inventory valuation, Valuation of inventory on balance sheet date, inventory accounting and control, Introduction to stocks & shares, Concept of cost of capital, introduction, importance, explicit & implicit cost, Measurement of cost of capital, cost of debt.

Theory of working capital: Nature and concepts **[No. of Hrs.: 09]**

TEXT BOOKS:

1. Maheshwari & Maheshwari, "An Introduction to Accountancy", 8th Edition, Vikas Publishing House, 2003

REFERENCES BOOKS:

1. Gupta R. L., Gupta V. K., "Principles & Practice of Accountancy", Sultan Chand & Sons, 1999.
2. Khan & Jain, "Financial Accounting"
3. Maheshwari S. N., "Principals of Management Accounting", 11th Edition, Sultan Chand & Sons, 2001.
4. Shukla and Grewal, "Advanced Accounts", 14th Edition, Sultan Chand & Sons.

Code No.: BCA 209	**L**	**T**	**C**
Paper: Object Oriented Programming	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

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++ - cin, cout, new, delete operators.

[No. of Hrs: 12]

UNIT – II

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

[No. of Hrs. 12]

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, Parametric polymorphism, **[No. of Hrs: 10]**

UNIT – IV

Generic function – template function, function name overloading, Overriding inheritance methods, Run time polymorphism, Multiple Inheritance.

Files and Exception Handling: Persistant objects, Streams and files, Namespaces, Exception handling, Generic Classes

[No. of Hrs: 10]

TEXT:

1. A.R.Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997.
2. S. B. Lippman & J. Lajoie, "C++ Primer", 3rd Edition, Addison Wesley, 2000.

REFERENCE:

1. R. Lafore, "Object Oriented Programming using C++", Galgotia Publications, 2004.
2. D . Parasons, "Object Oriented Programming with C++", BPB Publication.
3. Steven C. Lawlor, "The Art of Programming Computer Science with C++", Vikas Publication.
4. Schildt Herbert, "C++: The Complete Reference", 4th Ed., Tata McGraw Hill, 1999.
5. Tony Gaddis, Watters, Muganda, "Object-Oriented Programming in C++", 3rd Ed., Wiley Dreamtech, 2004.

Code No. : BCA 251	**L**	**P**	**C**
Paper: Practical – III	**0**	**12**	**6**

Practicals will be based on following Papers:

1. Front End Design Tools
2. Object Oriented Programming

Code No. : BCA 253*	**L**	**T**	**C**
Paper: General Proficiency – III	**2**	**0**	**2**

***Non University Examination Scheme (NUES)**

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.

Code No.: BCA 202	**L**	**T**	**C**
Paper: Mathematics IV	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

STATISTICS

COMBINATORICS: Permutation and Combination, Repetition and Constrained Repetition, Binomial Coefficients, Binomial Theorem.

PROBABILITY: Definition of Probability, Conditional Probability, Baye's Theorem

[No. of Hrs: 10]

UNIT II

PROBABILIT Y DISTRUBUTIONS: Review of Mean & Standard Deviation, Mathematical Expectation, Moments, Moment Generating Functions, Binomial, Poisson and Normal Distributions.

CORRELATION: Karl Person Coefficient of Correlation, Spearman's Rank Correlation, Least Square Method: Straight Line, Parabola and Exponential Curves: Regression Analysis.

[No. of Hrs: 10]

UNIT III

INTERPOLATION: Operators: Shift, Forward Difference, Backward Difference Operators and their Inter-relation, Interpolation Formulae-Newton's Forward, Backward and Divided Difference Formulae: Lagrange's Formula.

SOLUTION OF NON LINEAR EQUATION: Bisection Method, False Position Method, Newton – Raphson Method for Solving Equation Involving One Variable only.

[No. of Hrs: 12]

UNIT IV

SOLUTION OF LINEAR SIMULTANEOUS EQUATIONS: Gaussian Elimination Method with and without Row Interchange: LU Decomposition: Gauss - Jacobi and Gauss-Seidel Method; Gauss – Jordan Method and to find Inverse of a Matrix by this Method.

NUMERICAL DIFFERENTIATION- First and Second Order Derivatives at Tabular and Non-Tabular Points, Numerical Integration, Trapezoidal Rule, Simpsons 1/3 Rule: Error in Each Formula (without proof). **[No. of Hrs: 12]**

TEXT BOOKS:

1. H.K. Dass, "Advanced Engineering Mathematics"; S.Chand & Co., 9th Revised Edition, 2001.
2. S.K. Sarkar, "Discrete Mathematics"; S. Chand & Co., 2000.
3. S.S. Sastry, " Numerical Analysis"; Prentice Hall of India, 1998.

Code No.: BCA 204	**L**	**T**	**C**
Paper: Software Engineering	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

Introduction: Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models

Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS. **[No. of Hrs.: 12]**

UNIT – II

Software Project Management Concepts: The Management spectrum, The People The Problem, The Process, The Project

Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management. **[No. of Hrs.: 10]**

UNIT - III

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design

Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics, **[No. of Hrs.: 10]**

UNIT - IV

Software Testing: Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing. Debugging Activities

Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

[No. of Hrs.: 12]

TEXT:

1. K. K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International, 2005.
2. R. S. Pressman, "Software Engineering – A practitioner's approach", 5th Ed., McGraw Hill Int. Ed., 2001.

REFERENCE:

1. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN, 1996.
2. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach", John Wiley & Sons.
3. I. Sommerville, "Software Engineering", Addison Wesley, 2002.

Code No.: BCA 206	**L**	**T**	**C**
Paper: Java programming and website design	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

Java Programming: Data types, control structured, arrays, strings, and vector, classes (inheritance, packages, exception handling), multithreaded programming, **[No. of Hrs.: 12]**

UNIT – II

Java applets, AWT controls (Button, Labels, Combo box, list and other Listeners, menu bar), layout manager, string handling (only main functions), **[No. of Hrs.: 10]**

UNIT – III

Networking (datagram socket and TCP/IP based server socket), event handling, Drivers in java, JDBC, ODBC connectivity (database connectivity) **[No. of Hrs.: 12]**

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. **[No. of Hrs.: 10]**

TEXT BOOKS:

1. Patrick Naughton and Herbertz Schildt, "Java-2 The Complete Reference", 1999, TMH
2. Rick Dranell, "HTML 4 unleashed", Techmedia Publication, 2000.

REFERENCE BOOKS: -

1. H.M.Dietel, P.J.Dietel, T.R.Neito, Internet and world wide web – how to program, Addison Wiley, 2000.
2. H.Schildt, "The complete Java 2 reference", TMH, 1998.
3. Shelley Powers, "Dynamic Web Publishing", 2nd Ed., Techmedia, 1998.

Code No.: BCA 208	**L**	**T**	**C**
Paper: Operating System	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

Introduction, What is an Operating System, Simple Batch Systems, Multiprogrammed Batches 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

[No. of Hrs.: 12]

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 **[No. of Hrs.: 10]**

UNIT – III

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

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 **[No. of Hrs.: 10]**

UNIT – IV

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 **[No. of Hrs.: 12]**

TEXT:

1. Silbersachatz and Galvin, "Operating System Concepts", Pearson, 5th Ed., 2001
2. Madnick E., Donovan J., "Operating Systems", Tata McGraw Hill, 2001

REFERENCES:

1. Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000

Code No.: BCA 210	**L**	**T**	**C**
Paper: Business Economics	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT I

The Scope and Method of Economics, The Economic Problem: Scarcity & Choice, The Price Mechanism, Demand & Supply Equilibrium: The concept of Elasticity and its Applications.

The Production Process: Output decisions – Revenues, Costs and Profit Maximisation Laws of Returns & Returns to Scale; Economies and Diseconomies of Scale.

[No. of Hrs.: 12]

UNIT II

Market Structure: Equilibrium of a Firm and Price, Output Determination Under Perfect Competition, Monopoly, Monopolistic Competition & Oligopoly. **[No. of Hrs.: 12]**

UNIT III

Macro Economic Concerns: Inflation, Unemployment, Trade-Cycles: Circular Flow upto Four Sector Economy, Government in the Macro Economy: Fiscal Policy, Monetary Policy, Measuring National Income and Output. **[No. of Hrs.: 10]**

UNIT IV

The World Economy – WTO, Globalisation, MNCs, Outsourcing, Foreign Capital in India, Trips, Groups of Twenty (G-20), Issues of Dumping, Export- Import Policy 2004-2009.

[No. of Hrs.: 10]

TEXT BOOKS:

1. Ahuja H.L., "Business Economics", S. Chand & Co., New Delhi, 2001
2. Ferfuson P.R., Rothschild, R and Ferguson 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.

Code No. : BCA 252	**L**	**P**	**C**
Paper: Practical – IV	**0**	**8**	**4**

Practical will be based on following Paper:

1. Java Programming & Website Design

Code No. : BCA 254*	**L**	**P**	**C**
Paper: General Proficiency – IV	**2**	**0**	**2**

***Non University Examination Scheme (NUES)**

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.

Code No.: BCA 301	**L**	**T**	**C**
Paper: Computer Networks	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – 1

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.

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

[No. of Hrs.: 12]

UNIT – II

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 protocols: Transmission states, PPP layers, LCP, Authentication, NCP.

ISDN: Services, historical outline, subscriber's access, ISDN, Layers, and broadband ISDN.

[No. of Hrs.: 12]

UNIT – III

Devices: Repeaters, bridges, gateways, routers, The Network Layer, Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, Network-Layer in the Internet. **[No. of Hrs.: 10]**

UNIT – IV

Transport and upper layers in OSI Model: Transport layer functions, connection management, Functions of session layers, Presentation layer, and Application layer.

[No. of Hrs.: 10]

TEXT BOOKS:

1. A. S. Tanenbaum, "Computer Networks"; Pearson Education Asia, 4th Ed., 2003.
2. Behrouz A. Forouzan, "Data Communication and Networking", 3rd edition, Tata Mc Graw Hill, 2004.

REFERENCES:

1. D. E. Comer, "Internetworking with TCP/IP", Pearson Education Asia, 2001
2. William Stallings, "Data and computer communications", Pearson education Asia, 7th Ed., 2002.

Code No.: BCA 303	**L**	**T**	**C**
Paper: .net programming	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

.Net architecture, Namespheres, Assemblies, object oriented features, memory management, interoperation with IOM, transaction in .NET, Structured exception handling, code access security. **[No. of Hrs.: 11]**

UNIT – II

VB.NET

Similarities & differences with Visual Basic, windows focus, ADO.NET, working with databases, object oriented features. **[No. of Hrs.: 11]**

UNIT – III

ASP.NET

Similarities & difference with ASP, Architecture, web-form, development, XML, databases interface. **[No. of Hrs.: 11]**

UNIT – IV

C++ .NET

Similarities & differences with C/C++, Creating components, window four, menus, validation, database interface. **[No. of Hrs.: 11]**

TEXT:

1. A. Chakraborti et. al., "Microsoft .NET framework", PHI, 2002
2. M. Reynolds et. al., ".NET Enterprise", Wrox/SPD, 2002

REFERENCES:

1. Richard Blaur & Mathew Reynolds, "Beginning VB.net 2003", 3rd Edition, Wiley Dream Tech., 2003
2. Chris Willman, John Kauffman, "Beginning ASP.net 1.1 with VB.NET 2003", Wiley Dream Teach, 2003
3. Chris Ullman, John Kauffman, "Beginning ASP.NET with Visual #.net 2003", Wiley Dream Tech, 2003

Code No.: BCA 305	**L**	**T**	**C**
Paper: Linux Environment	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

UNIX & LINUX:- Overview of UNIX and LINUX Architectures editors and commands, shell scripts, system administration.

LINUX Internals:

Introduction: - Data structures in LINUX kernel, process management, systems calls

Memory Management:- Architecture independent memory model, virtual address space for a process, block devices, caching, paging under LINUX. **[No. of Hrs.: 11]**

UNIT-II

Inter Process Communication:- Synchronization in kernel, communication via files, pipes, ptrace, system V IPC, and sockets. **[No. of Hrs.: 11]**

UNIT-III

LINUX File System: - Representation of file system in the kernel, Proc and Ext2 file system.

Modules: - Modules in LINUX, debugging. **[No. of Hrs.: 11]**

UNIT-IV

Multiprocessing: - Multiprocessing, symmetric multiprocessing, Changes with respect to kernel initialization, spooling, message exchange between processes, interrupt handling

[No. of Hrs.: 11]

TEXT BOOKS:

1. A. Silberschatz, P. B. Galvin, "Operating System Concepts", John Wiley & Sons (Asia) Pte. Ltd, 2000
2. Neil Mathew, Richard Stones, "Beginning Linux Programming", 3rd Edition, Wiley Dream Tech, 2005

REFERENCES:

1. B. W. Kernighan & R. Pike, "The UNIX Programming Environment", Prentice Hall of India, 2000
2. Cox K., "Red Hat Linux Administrator's Guide", PHI, 2001
3. M. Beck, "LINUX Kernel Internals", Addison Wesley, 1997

Code No.: BCA 307	**L**	**T**	**C**
Paper: E-commerce	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

Introduction to E-Commerce: The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic 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, Existing Business Strategy, Strategy Formulation & Implementation Planning, E-Commerce Implementation, E-Commerce Evaluation. **[No. of Hrs.: 12]**

UNIT – II

Business-to-Business Electronic Commerce: Characteristics of B2B EC, Models of B2B EC, Procurement Management Using the Buyer's Internal Marketplace, Supplier-Oriented Marketplace, Intermediary-Oriented Marketplace, Just-in-Time Delivery, Other B2B Models, Auctions and Services from Traditional to Internet-Based EDI, Integration with Back-end Information Systems, 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.

Intranet 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 Structure of Extranets, Extranet Products & Services, Applications of Extranets, Business Models of Extranet Applications, Managerial Issues. **[No. of Hrs.: 12]**

UNIT – III

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-Valued Cards and E-Cash, Electronic Check Systems, Prospect of Electronic Payment Systems, Managerial Issues.

Public Policy: From Legal Issues to Privacy: EC-Related Legal Incidents, Legal, 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. **[No. of Hrs.: 10]**

UNIT – IV

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.

Economics, Global & Other Issues in EC: Competition in Marketspace, Some Issues in Digital Economy and Success Factors, Impacts on Industry Structure, Intermediaries, and

Others, virtual Communities, Global Electronic Commerce, Electronic Commerce in Small companies, Research in EC, The Future of EC **[No. of Hrs.: 10]**

TEXT BOOKS:

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

Code No.: BCA 309	**L**	**T**	**C**
Paper: Design and Analysis of Algorithms	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

Mathematical Preliminaries: Review of growth functions, Solution of difference equations.
Sorting and Order Statistics Merge sort, Heap sort, Quick sort, radix sort, bucket sort, median and order statistics. **[No. of Hrs.: 11]**

UNIT – II

Advanced Data Structures Review of binary search trees, dynamic set operation, red black trees, binomial heap.
Dynamic Programming Matrix multiplications, longest common subsequence and optimal polygon triangulation problems. **[No. of Hrs.: 11]**

UNIT – III

Greedy Algorithms**:** Activity selection, Huffman coding, and task scheduling problem.
Amortized Analysis Aggregate, accounting, and potential methods. **[No. of Hrs.: 11]**

UNIT – IV

String Matching, Naïve String Matching, Rabin karp and KMP algorithms.

[No. of Hrs.: 11]

TEXT:

1. T. H. Cormen, C. E. Leiserson, R. L. Rivest, Clifford Stein, "Introduction to Algorithms", 2nd Ed., PHI, 2004.

REFERENCES:

1. A. V. Aho, J. E. Hopcroft, J. D. Ullman, "The Design and Analysis of Computer Algorithms", Addition Wesley, 1998.
2. Ellis Horowitz and Sartaz Sahani, "Computer Algorithms", Galgotia Publications, 1999.
3. D. E. Knuth, "The Art of Computer Programming", 2nd Ed., Addison Wesley, 1998

Code No.: BCA 311	**L**	**T**	**C**
Paper: Computer Network Security	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT - I

Introduction: Attacks, 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.

[No. of Hrs.: 12]

UNIT – II

Net Work Security :
Authentication Application: Kerveros, X.509, Directory Authentication Service, Pretty Good Privacy, S/ Mime. **[No. of Hrs.: 12]**

UNIT – III

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

Web Security: Requirements, Secure Socket Layer, Transport Layer Security, and Secure Electronic Transactions. **[No. of Hrs.: 10]**

UNIT – IV

Network Management Security: Overview of SNMP Architecture-SMMPVI1 Communication Facility, SNMPV3.

System Security: Intruders, Viruses and Related Threats, Firewall Design Principles.

[No. of Hrs.: 10]

TEXT BOOKS:

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

Code No. : BCA 351	**L**	**P**	**C**
Paper: Practical – V	**0**	**8**	**4**

Practicals will be based on following Papers:

1. .net Programming
2. Linux Environment

Code No. : BCA 353 **C**
Paper: Summer Project / Training **2**

The viva will be conducted based on summer training of four weeks after the end of fourth semester.

Code No. : BCA 355	**L**	**P**	**C**
Paper: Minor Project	**0**	**8**	**4**

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

Code No. : BCA 357*	**L**	**P**	**C**
Paper: Seminar	**2**	**0**	**2**

***Non University Examination Scheme (NUES)**

An internal committee of the college will evaluate student & award the marks.

Code No.: BCA 302	**L**	**T**	**C**
Paper: Management Information Systems	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

The meaning and role of MIS: What is MIS?. Decision support systems, systems approach, the systems view of business, MIS Organization within the company.

Management Organizational theory and the systems approach:
Development of organization theory, management and organizational behavior, management, information, and the systems approach. **[No. of Hrs.: 11]**

UNIT – II

Information Systems for decision making: Evolution of an information system, Basic Information Systems, decision making and MIS, MIS as a technique for making programmed decisions, decision assisting information systems.

Strategic and project planning for MIS: General business planning, appropriate MIS response, MIS planning – general, MIS planning – details. **[No. of Hrs.: 11]**

UNIT – III

Conceptual system design: Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative conceptual designs and select one, document the system concept, prepare the conceptual design report. **[No. of Hrs.: 10]**

UNIT – IV

Implementation, evaluation and maintenance of the MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train and operating personnel, computer related acquisitions, develop forms for data collection and information, dissemination, develop the files, test the system, cut over, document the system, evaluate the MIS, control and maintain the system.
Pitfalls in MIS development: Fundamental weaknesses, soft spots in planning, design problems, implementation: The TAR PIT. **[No. of Hrs.: 12]**

Text book:

1. R. G. Murdick, J. E. Ross and J. R. Clagget, "Information Systems for Modern Management", 3rd Edition by, PHI – 1994.
2. Parker, Charles Case, Thomas, "Management Information System: Strategy & Action", 2nd Edition, TMH, 1993.

Code No.: BCA 304	**L**	**T**	**C**
Paper: Mobile Computing	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT 1:

Introducing the Mobile Internet: The Mobile Internet is here, The Rise of Mobile data. Key Services for the mobile Internet, Business opportunities. **[No. of Hrs.:10]**

UNIT 2:

WAP: the Mobile Internet Standard: Making the Internet Mobile: Challenges and Pitfalls, Overview of the Wireless Application Protocol **[No. of Hrs.:11]**

UNIT 3:

Implementing WAP Services: The Wireless Markup Language, Enhanced WML: WML Script and WTAI, User Interface Design: Marking
Wireless Applications Easy to Use. **[No. of Hrs.:12]**

UNIT 4:

Advanced WAP: Tailoring Content to the Client, Push Messaging, Wireless Telephony Applications, Building and Deploying End-to-End WAP Services.

Where Next: The Mobile Internet Future **[No. of Hrs.:11]**

TEXT BOOK:

1. Sandeep Singhal, "The Wireless Application Protocol, Writing Applications for Mobile Internet", Pearson Education, 2000

Code No.: BCA 306	**L**	**T**	**C**
Paper: Computer Graphics & Multimedia Applications	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

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

Graphics Hardware

Hardcopy Technologies, Display Technologies, Raster-Scan Display Systems, The 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

[No. of Hrs.: 12]

UNIT – II

Geometrical Transformations

2D Transformations, Homogeneous Coordinates and Matrix Representation of 2D Transformations, Composition of 2D Transformations, The Window-to-Viewport Transformation, Efficiency, Matrix Representation of 3D Transformations, Transformations as a Change in Coordinate System. **[No. of Hrs.: 10]**

UNIT – III

Representing Curves & Surfaces

Polygon Meshes, Parametric Cubic Curves, Quadric Surfaces.

Solid Modeling

Representing Solids, Regularized Boolean Set Operations, Primitive Instancing, Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Solid Geometry, Comparison of Representations, User Interfaces for Solid Modeling. **[No. of Hrs.: 10]**

UNIT – IV

Introductory Concepts: Multimedia, Defintion, CD-ROM and the multimedia highway, Uses of Multimedia, Introduction to making multimedia – The stages of Project, the hardware & software requirements to make good multimedia, Multimedia skills and training, Training Opportunities in Multimedia, Motivation for Multimedia usage

[No. of Hrs.: 12]

TEXT BOOKS:

1. Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles & Practice, 2000.
2. Ralf Skinmetz and Klana Naharstedt, "Multimedia: Computing, Communications and Applications", Pearson, 2001

REFERENCES BOOKS:

1. D. Harn & Baker: Computer Graphics, Prentice Hall of India, 1986.
2. D.J. Gibbs & D.C. Tsichritzis: Multimedia Programming Object, Environment & Framework, 2000
3. Foley, J.D. & Van Dam, A: Fundamentals of Interactive Computer Graphics.
4. Rogers & Adams, "Mathematical Elements for Computer Graphics", McGraw Hill, 1989.
5. Tay Vaughan, "Multimedia: Making it Work", TMH, 2000.

Code No.: BCA 308	**L**	**T**	**C**
Paper: Internet Programming	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

Microsoft Visual InterDev: Web servers, Creating a project, Use of project Explorer, Toolbox window, Site design

Java Script., Data types, Control structures, Functions, Arrays, and Objects.

[No. of Hrs.: 11]

UNIT – II

DHTML: CSS, Object Model collection, event model, filter and transitions, data binding with tabular data control.

VB script and its utility functions. **[No. of Hrs.: 10]**

UNIT – III

Web servers- PWS set up, publishing information, and publishing Internet information server.

Database: registering ODBC, database, ADO (active X data objects)

ASP-Active server pages, client side and server side programming. **[No. of Hrs.: 12]**

UNIT – IV

XML-Structuring data, DTD's using XML with HTML and CSS, XML parsers.

Servlets. **[No. of Hrs.: 11]**

TEXT BOOKS:

1. H.M.Dietel, P.J.Dietel, T.R.Neito, "Internet and worldwide web – how to program", Addison Wiley, 2000.
2. H.Schildt, The complete Java2 reference, TMH, 1998.

Code No.: BCA 310	**L**	**T**	**C**
Paper: Knowledge Management & New Economy	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I

Business Intelligence and Business Decisions; Modelling Decision Processes; Decision support systems; Group decision support and Groupware Technologies. **[No. of Hrs.: 11]**

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. **[No. of Hrs.: 11]**

UNIT – III

Multi-dimensional analysis; Data mining and knowledge discovery; Data mining and Techniques; Data Mining of Advance Databases. **[No. of Hrs.: 11]**

UNIT – IV

Knowledge Management Systems: Concept and Structure KM systems, techniques of knowledge management appreciation & limitation. **[No. of Hrs.: 11]**

TEXT BOOKS:

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

Code No.: BCA 312	**L**	**T**	**C**
Paper: Artificial Intelligence	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT - I

Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success.

Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem

Heuristic search techniques :Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction **[No. of Hrs.: 11]**

UNIT - II

Knowledge representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation

Using Predicate Logic :Represent ting Simple Facts in logic, Repsenting instances and isa relationship, Computable function and predicate. **[No. of Hrs.: 12]**

UNIT - III

Natural language processing :Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing

Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning

[No. of Hrs.: 11]

UNIT - IV

Expert System: Introduction,Repsenting using domain specific knowledge,Expert system shells.

LISP and other AI Programming Language **[No. of Hrs.: 10]**

Text Book:

1. E. Rich and K. Knight, "Artificial intelligence", TMH, 2nd ed., 1999.

Reference:

1. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999
2. Nils J Nilsson ,"Artificial Intelligence -A new Synthesis" 2nd Edition (2000), Harcourt Asia Ltd.

Code No. : BCA 352	**L**	**P**	**C**
Paper: Practical – VI	**0**	**8**	**4**

Practical will be based on following Paper:

1. Computer Graphics & Multimedia Applications
2. Electives (if required)

Code No. : BCA 354*	**L**	**P**	**C**
Paper: Major Project / Seminar	**0**	**10**	**5**

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