SCHEME OF EXAMINATION

&

SYLLABI

for

Bachelor / Master of Technology (Dual Degree)
Computer Science & Engineering

Offered by

University School of Information Technology

1ST SEMESTER TO 8TH SEMESTER

GURU GOBIND SINGH
INDRAPRASTHA
UNIVERSITY

Guru Gobind Singh Indraprastha University
Kashmere Gate, Delhi – 110 403 [INDIA]
www.ipu.ac.in

GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY
KASHMERE GATE, DELHI
Bachelor / Master of Technology (Dual Degree)
Computer Science & Engineering

First Semester

First Semester					
Code	**Paper ID**	**Paper**	**L**	**T/P**	**Credits**
Theory Papers					
HS101	98101	Communication Skills-I	2	1	3
BA103	99103	Chemistry – I	2	1	3
IT 105	15105	Introduction to Computers	3	-	3
IT 107	15107	Electrical Science	3	1	4
BA109	99109	Mathematics – I	3	1	4
BA111	99111	Physics – I	2	1	3
HS119*	98119	Impact of Science & Technology on Society – I	1	-	1
Practical/Viva Voce					
BA151	99151	Chemistry-I Lab	-	2	1
BA153	99153	Physics-I Lab	-	2	1
IT155	15155	Computer Lab	-	2	1
IT157	15157	Engineering Graphics-I	-	2	1
IT159	15159	Electrical Science Lab	-	2	1
Total			**16**	**15**	**26**

***NUES**

GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY
KASHMERE GATE, DELHI
Bachelor / Master of Technology (Dual Degree)
Computer Science & Engineering

Second Semester

Second Semester					
Code	**Paper ID**	**Paper**	**L**	**T/P**	**Credits**
Theory Papers					
HS102	98102	Communication Skills – II	1	2	3
IT104	15104	Engineering Mechanics	3	1	4
BA108	99108	Mathematics – II	3	1	4
BA110	99110	Physics-II	2	1	3
BA114	99114	Statistics Theory of Probability and Linear Programming	2	1	3
BA118	99118	Chemistry-II	2	1	3
HS126*	98126	Impact of Science & Technology on Society – II	1	-	1
IT128	15128	Data Structures	3	0	3
Practical/Viva Voce					
BA156	99156	Physics –II Lab	-	2	1
BA162	99162	Chemistry –II Lab	-	2	1
IT152	15152	Data Structure Lab	-	2	1
IT154	15154	Engineering Graphics-II lab	-	2	1
Total			**17**	**15**	**28**

***NUES**

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Computer Science & Engineering

Third Semester

Third Semester					
Code	**Paper ID**	**Paper**	**L**	**T/P**	**C**
Theory Papers					
IT201	15201	Computational Methods	3	1	4
IT203	15203	Circuits and Systems	3	1	4
IT205	15205	Electronic Devices and Circuits	3	1	4
IT207	15207	Object Oriented Programming Using C++	3	1	4
IT209	15209	Computer Graphics	3	1	4
IT211	15211	Database Management Systems	3	1	4
Practical/Viva Voce					
IT251	15251	Electronic Devices and Circuits Lab.	-	2	1
IT253	15253	Computation Lab.	-	2	1
IT255	15255	Object Oriented Programming Lab.	-	2	1
IT257	15257	Computer Graphics Lab.	-	2	1
IT259	15259	DBMS Lab.	-	2	1
Total			**18**	**16**	**29**

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Fourth Semester

Fourth Semester					
Code	**Paper ID**	**Paper**	**L**	**T/P**	**C**
Theory Papers					
IT202	15202	Java Programming	3	1	4
IT204	15204	Multimedia Applications	3	1	4
IT206	15206	Switching Theory and Logic Design	3	1	4
MS208	39208	Organization Behaviour	3	1	4
IT210	15210	Foundations of Computer Science	3	1	4
IT212	15212	Software Engineering	3	1	4
Practicals					
IT252	15252	Java Programming Lab.	-	2	1
IT254	15254	Multimedia Lab.	-	2	1
IT256	15256	Switching Theory and Logic Design Lab.	-	2	1
IT258	15258	Software Engineering Lab.	-	2	1
Total			**18**	**14**	**28**

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Fifth Semester

Fifth Semester					
Code	**Paper ID**	**Paper**	**L**	**T/P**	**C**
IT301	15301	Theory of Computation	3	1	4
IT303	15303	Analog and Digital Communication	3	1	4
IT305	15305	Computer Architecture	3	1	4
IT307	15307	Digital Signal Processing	3	1	4
IT309	15309	Object Oriented Software Engineering	3	1	4
IT311	15311	Digital Design Using VHDL	3	1	4
Practicals					
IT351	15351	Analog & Digital Communication Lab.	-	2	1
IT353	15353	Digital Signal Processing Lab.	-	2	1
IT355	15355	Digital Design Lab.	-	2	1
IT357*	15357	Summer Training (Conducted at the end of the 4th Semester) Report, Seminar and Viva - Voce	-	2	1
Total			**18**	**14**	**28**

***NUES**

GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY
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Bachelor / Master of Technology (Dual Degree)
Computer Science & Engineering

Sixth Semester

Sixth Semester					
Code	**Paper ID**	**Paper**	**L**	**T/P**	**C**
Theory Papers					
IT302	15302	Microprocessors	3	1	4
IT304	15304	Computer Networks	3	1	4
IT306	15306	Algorithm Analysis and Design	3	1	4
IT308	15308	Compiler Design	3	1	4
IT310	15310	Operating Systems	3	1	4
Practicals					
IT352	15352	Microprocessor Lab.	-	2	1
IT354	15354	Algorithm Analysis & Design Lab.	-	4	2
IT356	15356	Compiler Design Lab.	-	2	1
Total			**15**	**13**	**24**

GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY
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Bachelor / Master of Technology (Dual Degree)
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Seventh Semester

Seventh Semester					
Code	**Paper ID**	**Paper**	**L**	**T/P**	**C**
Theory Papers					
IT401	15401	Advanced Computer Networks	3	1	4
IT403	15403	Software Testing	3	1	4
Electives (Choose any two)					
IT405	15405	Distributed Systems	3	1	4
IT407	15407	Artificial Intelligence	3	1	4
IT409	15409	Simulation and Modeling	3	1	4
IT411	15411	Digital Image Processing	3	1	4
IT413	15413	Front End Design Tools and Web Technologies	3	1	4
IT415	15415	Advanced Java Programming	3	1	4
Practicals					
IT451	15451	ACN Lab.	-	2	1
IT461	15461	Software Testing Lab.	-	2	1
IT455	15455	Laboratory work for electives	-	2	1
IT457	15457	Minor Project	-	-	7
IT459*	15459	Summer Training (Conducted at the end of the 6th Semester) Report, Seminar and Viva - Voce	-	-	1
Total			**12**	**10**	**25**

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Eighth Semester

Eighth Semester					
Code	**Paper ID**	**Paper**	**L**	**T/P**	**C**
HS402*	98402	Technical Writing	2	-	2
Electives (Choose any two)					
IT404	15404	Advanced Computer Architecture	3	1	4
IT406	15406	Control Systems	3	1	4
IT408	15408	Advanced Database Management Systems	3	1	4
IT410	15410	Soft Computing	3	1	4
IT412	15412	Natural Language Processing	3	1	4
IT414	15414	Windows .Net Framework and C# Programming	3	1	4
Practicals					
IT452	15452	Major Project (Report)		-	8
IT454	15454	Viva – Voce (On major project)		-	2
IT456*	15456	Seminar and progress report		-	1
IT458	15458	Laboratory work for electives		2	1
Total			**8**	**4**	**22**

***NUES**

Note:

1. '*' Marked papers are NUES papers.
2. Total number of credits in BTECH(CSE) = 210
3. The minimum number of credits to be earned for the award of the degree is = 200

Code: HS 101		**L**	**T/P**	**C**
Paper ID: 98101	**Paper: Communication Skills – I**	**2**	**1**	**1**

I. Remedial Grammar
- (a) Simple sentences – their phrase structure
- (b) Parts of speech
- (c) Tense and concord
- (d) Gerunds, Participles & Infinitives
- (e) Complex and Compound sentences (Use of connectives)
- (f) Conditional clauses
- (g) Question tags & short responses
- (h) Common errors

II. Vocabulary and Usage
- (a) Synonyms & Antonyms
- (b) One word substitutions
- (c) Words often confused
- (d) Idioms / Idiomatic expressions
- (e) Foreign Phrases (Greek and Latin)

III. Presentation of Technical Information:
Technical description of
- (a) Simple objects, tools, appliances
- (b) Processes and operations
- (c) Scientific principles

IV. Composition:
- (a) Comprehension – Unseen passages
- (b) Dialogues – Creation of mock situations.
- (c) Debates – Discussing the pros and cons of a given topic.
- (d) Thematic Appreciation Exercises / Development of situational outlines.

V. Prose
Selected prose pieces from prescribed texts.

Paper Code: BA-103		L	T/P	C
Paper ID: 99103	Paper: Organic Chemistry	2	1	3

1. **Water:** Specifications for water, Analysis of water-Alkanity, hardness and its determination (EDTA Method only), water for domestic use, Water-softening-Lime-Soda process, Ion-exchanger polished water, Boiled-feed water, boiler problems-scale, sludge priming and foaming, caustic embrittlement and corrosion, their causes and prevention, removal of silice, removal of dissolved gases, carbonates phosphates conditioning, colloidal conditioning, Calgon treatment, conditioning, Numerical problems of Alkanity, hardness Lime-Soda process and EDTA method.

2. **Fuels:** Definition and classification, combustion and chemical principles involved in it. Calorific value: Gross and Net Calorific values and their determination by Boy's Gas Calorimeter and Bomb Calorimeter.

   i) Solid fuels: Proximate and ultimate analysis of coal and their importance.
   Carbonization: High and Low temperature carbonization, coke, its manufacture by the Otto Hoffman Oven and uses.

   ii) Liquid fuels: Converison of coal into liquid fuels (Bogius process & Fischer Tropsch process and mechanism, Petroleum: its chemical composition and Fractional distillation, Cracking of heavy oil residues: thermal cracking and catalytic cracking, Knocking-chemical structure and knocking: Octane and Cetane number and their significance, Power alcohol.

   iii) Gaseous Fuels: Natural gas, producer gas, water gas, carburetted water gas, coal gas and oil gas, fuel and fuel gases and their analysis by Orsat's apparatus.

   iv) Numerical on calorific value, combustion, Proximate and ultimate analysis of coal and fuel gas analysis.

   v) Nuclear Fuels: Nuclear reactions, nuclear fission and nuclear fusion, Nuclear reactor.

3. **Polymers:** Basic concepts & Terminology, such as monomers, Polymers, functionality, Thermoplastics, Thermosets, Linear, Branched, cross linked polymers etc. Different definitions of molecular weight's viz. Mw, Mn, Mv and then determinations, Industrial applications of polymers, Addition, condensation and Ionic polymerization's solutions of polymers, good solvents, & bad solvent, solubility parameter, solutions viscosity and determination of intrinsic viscosity.

4. **Corrosion:** Definition and types of corrosion, Laws of oxide film 'growth (Linear, parabolic and logarithmic), different theories of corrosion, Atmospheric corrosion, Stress corrosion, water-line, pitting and soil corrosion.

Protective measures against corrosion:

i) Modification of environment
ii) Modification of the properties of the metal
iii) Use of protective coatings
iv) Cathodic Protection
v) Material selection and design

Code : IT105		L	T/P	C
Paper ID:15105	Paper: Introduction To Computers	3	0	3

I. Introduction: Overview of computer organization and historical perspective computer applications in various fields of science and management.
Data representation: Number systems, character representation codes, Binary, hex, octal codes and their inter conversions. Binary arithmetic, Floating point arithmetic, signed and unsigned numbers. Data Storage: Primary and Secondary storage, Introduction to various computer devices such as keyboard, mouse, printers, disk files, floppies etc. Concept of computing, contemporary, Operating Systems such as DOS, Windows'95, UNIX etc. (only brief user level description). Introduction to organization and architecture of mainframe, mini and micro systems. Introduction to E-mail, ftp, login and other network services, world wide web, MS-Office.

II. Introduction to Programming: Concept of algorithms, Flow charts, Example of Algorithms such as how to add ten numbers, roots of a quadratic equation. Concept of sequentially following up the steps of a algorithm.Notion of program, programmability and programming languages, Structure of programs, Object codes, compilers.
Introduction to the Editing tools such as vi or MS-VC editors. Concepts of the finite storage, bits, bytes, kilo, mega and gigabytes, Concepts of character representation.

III. Programming using C: The emphasis should be more on programming techniques rather that the language itself. The C programming language is being chosen mainly because of the availability of the compilers, books and other reference materials. Example of some simple C program. Dissection of the program line by line, Concepts of Variables, program statements and function calls from the library (printf for example)

- C data types, int, char, float etc.
- C expressions, arithmetic operations, relational and logic operations.
- C assignment statements, extension of assignment to the operations. C primitive input output using getchar and putchar, exposure to the scanf and printf functions.
- C statements, conditional executing using if, else. Optionally switch and break statements may be mentioned.
- Concepts of loops, example of loops in C using for, while and do-while, Optionally continue may be mentioned.
- One dimensional arrays and example of iterative programs using arrays, 2-d arrays. Use in matrix computations.
- Concept of Sub-programming, functions, Example of functions, Argument passing mainly for the simple variables.
- Pointers, relationship between arrays and pointers, Argument passing using pointers, Array of pointers, Passing arrays as arguments.
- Strings and C string library
  Structures and Unions. Defining C structures, passing strings as arguments, programming examples.
- File I/O, Use of fopen, fscanf and fprintf routines

Code: IT107		L	T/P	C
Paper ID: 15107	Paper: Electrical Science	3	1	4

I. Properties of Conductors and Insulators
Basic laws of Electrical Engineering
Temperature Resistance Coefficients

II. D.C. Circuits
Network theorems and applications
Division of Current
Potentiometer
Circuit Parameters
Energy and Power
Superposition
Thevenin and Reciprocity theorems
Star Delta Formations

III. Alternating Currents
Peak, Average and RMS values for alternating currents
Power and Power factor
Resistance, Inductance and Capacitance
Resonance
Q Factor

IV. Electromagnetism
Magnetic Induction
Permeability
Hysteresis

V. Measuring Instruments
Moving Coil and Moving Iron Instruments
Construction of Instruments
Attraction and Repulsion type
Permanent Magnet and Eletrodynamics, Dynamometer type

VI. D.C. Generators & Motors
Principle of operation of Generators & Motors
Speed Control of shunt motors
Flux control, Rheostatic control, voltage control
Speed control of series motors

VII. A.C. Generators & Motors
Principle of operation
Removing Magnetic field
Squirrel cage and phase wound rotor
Starting of Induction motors
Direct on line and Star Delta starters
Synchronous machines

VIII. Transformers

Construction
Regulation and efficiency calculations
Open and short circuit tests

Paper Code: BA-109		L	T/P	C
Paper ID: 99109	Paper : Mathematics – I	3	2	4

1(a) Calculus of functions of One variable

(i) Successive Differentiation, Leibnitz's theorem (without proof). Lagrange's Theorem, Cauchy Mean value theorems, Taylor's theorem (without proof), Remainder term, Asymptotes, Curvature, Curve Tracing.

14 hrs

(ii) Infinite Series: Convergence, divergence, Comparison test, Ration Test, Cauchy n^{th} root test, Leibnitz's test (without proof), Absolute and Conditional Convergence, Taylor and Meclaurin series, Power Series, Radius of Convergence.

5 hrs

(iii) Integral Calculus: Reduction Formulae of trigonometric functions, Properties of definite Integral, Applications to length, area, volume, surface of revolution, Definition of improper integrals, Beta-Gamma functions.

8 hrs

1(b) Calculus of Functions of several variables:

Partial derivatives, Chain rule, Differentiation of Implicit functions, Exact differentials. Maxima, Minima and saddle points, Method of Lagrange multipliers. Differentiation under Integral sign, Jacobians and transformations of coordinates. Double and Triple integrals. Simple applications to areas, Volumes etc.

12 hrs

II Vector Calculus:

Scalar and vector fields, Curves, Arc length, Tangent, normal, Directional Derivative, Gradient of scalar field, divergence and curl of a vector field. Line integral (independent of path), Green's theorem, Divergence theorem and Stoke's theorem (without proofs), Surface Integrals.

12 hrs

Suggested Text Books & References

1. G.B. Thomas and R.L. Finney, "Calculus and Analytic Geometry", 6th edition, Addison-Wesley/Narosa, 1985.
2. Shanti Narayan, "Differential Calculus", S. Chand & Co.
3. Shanti Narayan, "Integral Calculus", S. Chand & Co.
4. Grewal B.S., "Higher Engineering Mathematics", Khanna Publ.
5. E. Kreyszig, "Advanced Engineering Mathematics", 5th Edition, Wiley Eastern, 1985.
6. Murray R. Spiegel, "Theory and Problems of Vectors Analysis", Schaum's Outline Series, Mc Graw Hill Ed.
7. S.C. Malik, "Mathematical Analysis", Wiley Eastern Ltd.
8. "Advanced Calculus", Schaum's Outline Series, Mc Graw Hill Ed.
9. Widder, "Advanced Calculus", 2nd Edition, Prentice Hall Publishers.

		L	T/P	C
Paper Code: BA-111				
Paper ID: 99111	**Paper: Physics – I**	**2**	**1**	**3**

I OPTICS

Polarization

Types of polarization, elliptically and circularly polarized light Brewsters law, Malu's law, Nicol prism, double refraction, quarter-wave and half-wave plates, optical activity, specific rotation, Laurent half shade polarimeter.

5 hrs.

Interference

Coherence and coherent sources, interference by division of wave front (young's double slit experiment, Fresnel's biprism), interference by division of amplitude (thin films, Newton's rings, Michelson's interferrometer, Fabry Perot interferrometer)

7 hrs.

Diffraction

(Fresnel and Fraunhofer types of diffraction) Fraunhofer difraction: Single slit, double slit, circular aperture and N-slit, diffraction grating wavelength determination, resolving power and dispersive power, Fresnel Diffraction: Zone plate, circular aperture, opaque circular disc, narrow slit.

7 hrs.

II LASER AND FIBRE OPTICS

Lasers

Introduction, coherence, Einstein A and B coefficients, population inversion, basic principle and operation of a laser, type of lasers, He-Ne laser, Ruby laser, semiconductor laser, holography-theory and applications.

5 hrs.

Fibre Optics:

Introduction to optical fibre, types of optical fibres and their characteristics, (Attenuation and dispersion step index and graded index fibres, principle of fibre optic communication-total internal reflection, numerical aperture, fibre optical communication network (qualitative)-its advantages.

5 hrs.

III Theory of relativity

Absolute and Inertial frames of reference, Galenlian transformations, Michelson-Morley experiment, the postulates of the special theory of relativity, Lorentz transformations, time dilation, length contraction, velocity addition, mass energy equivalence.

5 hrs.

Recommended Books

1. Concepts of Modern Physics: A. Beiser
2. Modern Physics: Kenneth Krane
3. Fundaments of Optics: Jenkins and White
4. Optics: Ghatak
5. Fundamental of Physics by RESNICK & HALLIDAY

Practicals:

Code: BA151		**L**	**T/P**	**C**
Paper ID:99151	**Paper: Chemistry – I Lab.**	**0**	**2**	**1**

Practicals based on BA103.

Code: BA153		**L**	**T/P**	**C**
Paper ID:99153	**Paper: Physics– I Lab.**	**0**	**2**	**1**

Practicals based on BA109.

Code: IT155		**L**	**T/P**	**C**
Paper ID:15155	**Paper: Computer Lab.**	**0**	**2**	**1**

Practicals based on IT105.

Code: IT157		**L**	**T/P**	**C**
Paper ID:15157	**Paper: Engineering Graphics –I**	**0**	**2**	**1**

1. General
   Importance, Significance and scope of engineering drawing, Lettering, Dimensioning, Scales, Sense of proportioning, Different types of projections, Orthographic projections, B.I.S. Specifications.

2. Projections of Points and Lines
   Introduction of planes of projection, Reference and auxiliary planes, projections of points and lines in different quadrants, traces, inclinations, and true lengths of the lines, projections on auxiliary planes, shortest distance intersecting and non-intersecting lines.

3. Planes Other than the Reference Planes
   Introduction of other planes (perpendicular and oblique), their traces, inclinations etc., projections of points and lines lying in the planes, conversion of oblique plane into auxiliary plane and solution of related problems.

4. Projections of Plane Figures
   Different cases of plane figures (of different shapes) making different angles with one or both reference planes and lines lying in the plane figures making different given angles (with one or both reference planes). Obtaining true shape of the plane figure by projection.

5. Projection of Solids
   Simple cases when solid is placed in different positions, Axis, faces and lines lying in the faces of the solid making given angles.

6. Development of Surface
   Development of simple objects with and without sectioning.

7. Nomography
   Basic concepts and use.

Code: IT159		L	T/P	C
Paper ID:15159	Paper: Electrical Science Lab.	0	2	1

Practicals based on IT107.

Code: HS102		L	T/P	C
Paper ID:98102	Paper: Communication Skills – II	1	2	3

1. Some Key Concepts:
   Communication as sharing; context of communication; the speaker/writer and the listener/reader; medium of communication; barriers to communication; accuracy, brevity, clarity and appropriateness in communication.

2. Writing:
   Selecting material for expository, descriptive, and argumentative pieces; business letters; formal report; summarizing and abstracting; expressing ideas within a restricted word limit; paragraph division, introduction and the conclusion; listing reference material; use of charts, graphs and tables; punctuation and spelling; semantics of connectives, modifiers and modals, variety in sentences and paragraphs.

3. Reading Comprehension:
   Reading at various speeds (slow, fast, very fast), reading different kinds of texts for different purposes (e.g., for relaxation, for information, for discussion at a later stage, etc.); reading between the lines.

4. Speaking:
   Achieving desired clarity and fluency; manipulating paralinguistic features of speaking (voice quality, pitch, tone, etc.); pausing for effectiveness while speaking, task-oriented, interpersonal, informal and semiformal speaking; making a short classroom presentation.

5. Group Discussion:
   Use of persuasive strategies including some rhetorical devices for emphasizing (for instance; being polite and firm; handling questions and taking in criticism of self; turn-taking strategies and effective intervention; use of body language).

6. Listening Comprehension:
   Achieving ability to comprehend material delivered at relatively fast speed; comprehending spoken material in Standard Indian English, British English and American English, intelligent listening in situations such as an interview in which one is a candidate.

Code: IT104		L	T/P	C
Paper ID:15104	Paper: Engineering Mechanics	3	1	4

1. Force System: Introduction, force, principle of transmissibility of force, resultant of a force system, resolution of a force, moment of force about a line. Varigon's theorem, couple, resolution of force into force and a couple, properties of couple and their application to engineering problems.

2. Equilibrium: Force body diagram, equations of equilibrium and their applications to engineering problems, equilibrium of two force and three force member

3. Structure: Plane truss, perfect and imperfect truss, assumption in the truss analysis, analysis of perfect plane trusses by the method of joints, method of section and graphical method.

4. Friction: Static and Kinetic friction, laws of dry friction, co-efficient of friction, angle of friction, angle of repose, cone of friction, frictional lock, friction of flat pivot and collered thrust bearings, friction in journal-bearing, friction in screws, derivation of equation.

   $T_1 / T_2 = \lambda_e A$ and its application.

5. Distributed Forces: Determination of center of gravity, center of mass and centroid by direct integration and by the method of composite bodies mass moment of inertia and area moment of inertia by direct integration and composite bodies method, radius of gyration, parallel axis theorem, Pappus theorems, polar moment of inertial., Dynamics.

6. Kinematics of Particles: Rectilinear motion, plane curvilinear motion-rectangular co-ordinates, normal and tangential coordinates

7. Kinetics of Particles: Equation of motion, rectilinear motion and curvilinear motion, work energy equation, conservation of energy, impulse and momentum conservation of momentum, impact of bodies, co-efficient of restitution, loss of energy during impact.

8. Kinematics of Rigid Bodies: Concept of rigid body, types of rigid body motion, absolute motion, introduction to relative velocity, relative acceleration (Corioli's component excluded) and instantaneous center of zero velocity, Velocity and acceleration polygons for four bar mechanism and single slider mechanism.

9. Kinetics of Rigid Bodies: Equation of motion, translatory motion and fixed axis rotation, application of work energy principles to rigid bodies conservation of energy.

10. Vibrations: Classification, torsional free vibrations-single rotor and two rotor system, Spring mass system-its damped (linear dash pot) and undamped free vibrations, spring in series and parallel, simple problems.

Text/Reference:

1. U.C. Jindal, "Engineering Mechanics", Galgotia Publication.2000.

Mathematics - II

Paper Code: BA – 108

L	T/P	Credits
3	1	4

I. Linear Algebra: Linear Independence and dependence of vectors, Systems of linear equations – consistency and inconsisitency, Gauss elimination method, rank of a matrix, Bilinear, Quadratic, Hermitian, Skew – Hermitian Forms, Eigenvalues and Eigenvectors of a matrix, diagonalization of a matrix, Cayley – Hamilton Theorem (without proof).

10 hrs.

II. Ordinary Differential Equations: Formation of ODE's, definition of order, degree and solutions. ODE's of first order: Method of separation of variables, homogeneous and nonhomogeneous equations, exactness and integrating factors, linear equations and Bernouilli equations, operator method, method of undetermined coefficients and nonhomogenous, operator method, method of undetermined coefficients and variation of parameters. Solutions of simple simultaneous ODE's. Power series method of solution of DE, Legendre's Equation, Legendre's Polynomials, Bessel's equation, Bessel's function.

10 hrs.

III. Complex Variables: Curves and Regions in the Complex Plane, Complex Functions, Limits, Derivative, Analytic Function, Cauchy-Riemann Equations, Laplace's Equation, Linear Fractional Transformations, Conformal Mapping, Complex Line Integral, Cauchy's Integral Theorem, Cauchy's Integral Formula, Derivatives of Analytic Function, Power Series, Taylor Series, Laurent Series, Methods for obtaining Power Series, Analyticity at Infinity, Zeroes, Singularities, Residues, Residue Theorem, Evaluation of Real Integrals.

18 hrs.

IV. Probability: Definition of Sample Space, Event, Event Space, Conditional Probability, Additive and Multiplicative law of Probability, Baye's Law theorem, Application based on these results.

5 hrs.

Suggested Text Books & References

1. M. K. Singhal & Asha Singhal "Algebra", R. Chand & Co.
2. Shanti Narayan, "Matrices" S. Chand & Co.
3. G. B. Thomas and R. L. Finney, "Calculus and Analytic Geometry" Addison Wesley / Narosa.
4. E. Kreyszig, "Advanced Engineering Mathematics", 5th Edition, Wiley Eastern Ltd. 1985.
5. N. M. Kapoor "Differential Equations" Pitamber Pub. Co.
6. Schaum Outline Series "Differential Equations" Mc. Graw Hill.
7. Schaum Outline Series "Complex Variables" Mc. Graw Hill.
8. Schaum Outline Series "Linear Algebra" Mc. Graw Hill.
9. Schaum Outline Series "Probability" Mc. Graw Hill.

PHYSICS - II

Paper Code: BA – 110

L	T/P	Credits
2	1	3

I. Quantum Mechanics

Wave particle duality, deBroglie waves, evidences for the wave nature of matter – the experiment of Davisson and Germer, electron diffraction, physical interpretation of the wave function and its properties, the wave packet, the uncertainty principle

4 hrs.

The Schrodinger wave equation (1 – dimensional), Eigen values and Eigen functions, expectation values, simple Eigen value problems – solutions of the Schrodinger's equations for the free particle, the infinite well, the finite well, tunneling effect, simple harmonic oscillator (qualitative), zero point energy.

6 hrs.

II. Quantum Statistics

The statistical distributions: Maxwell Boltzmann, Bose-Einstein and Fermi-Dirac statistics, their comparisons, Ferminos and Bosons Applications: Molecular speed and energies in an ideal gas. The Black body spectrum, the failure of classical statistics to give the correct explanations – the applicatons of Bose-Einstein statistics to the Black body radiation spectrum, Fermi-Dirac distribution, free electron theory, electronic specific heats, Fermi energy and average energy – its significance.

10 hrs.

III Band Theory of Solids

Origin of energy bands in solids, motion of electrons in a periodic potential – the Kronig – Penny model. Brillouin zones, effective mass, metals, semi-conductors and insulators and their energy band structures. Extrinsic and Intrinsic semiconductors, doping – Fermi energy for doped and undoped semiconductors, the p-n junction (energy band diagrams with Fermi energy), the unbiased diode, forward and reverse biased diodes – tunnel diodes, zener diode, photo diode its characteristics, LED, Introduction to transistors.

10 hrs.

IV Overview of Electro – Magnetism

Maxwell's Equations: The equation of continuity for Time – Varying fields, Inconsistency in ampere's law Maxwell's Equations, conditions at a Boundary Surface, Introduction to EM wave.

4 hrs.

Recommended Books

1. Concept of Modern Physics: A. Beiser
2. Modern Physics: Kenneth Krane
3. Solid State Physics by Kittle
4. Electronic Principles: Malvino
5. Statistical Mechanics by Garg Bansal and Ghosh (TMH)

STATISTICS, THEORY OF PROBABILITY AND LINEAR PROGRAMMING

Paper Code: BA – 114

L	T/P	Credits
2	1	3

I. Probability, Statistics

Elementary Probability theory, Random Variables: discrete and continuous, distribution and density functions, Expectation, Moments, Moment Generating function, Skewness, Kurtosis, Binomial, Poisson and Normal distribution, Method of least square for linear and parabolic curves, Correlation of a bivariate distribution, Linear regression, properties of regression coefficient, Sampling distribution of mean and variance, Testing of Statistical hypothesis, F-test, T-test and chi square test.

17 hrs.

II. Linear Programming

Mathematical Preliminaries, Formulation of the Problem and Solution by Graphical method. The simplex Method, Dual problem formulation and Solution, Application to Transportation and Assignment Problems.

17 hrs.

Suggested Text Books & References

1. Irwin Miller and John E. Freund, "Probability and Statistics for Engineers" PHI
2. Spiegel, "Probability and Statistics", Schaum Series
3. S C. Gupta and V. K. Kapur "Fundamentals of Mathematical Statistics", Sultan Chand & Sons.
4. Kambo N. S., "Mathematical Programming Techniques", Mc Graw Hill
5. Hadley, "Linear Programming" Narosa Publications.

CHEMISTRY – II

Paper Code: BA – 118

L	T/P	Credits
2	1	3

1. Atomic Structure: Introduction to wave mechanics, the Schrodinger equation as applied to hydrogen atom, origin of quantum numbers, Long form of periodic table on the basis of Electronic configuration s, p, d, f block elements periodic trends, Ionisation potential, atomic and ionic radii electron affinity & electro-negativity.

2. Chemical Bonding: Ionic bond, energy changes, lattice energy Born Haber Cycle, Covalent bond-energy changes, Potential energy curve for H2 molecule, characteristics of covalent compound, co-ordinate bond-Werner's Theory, effective atomic numbers, A hybridization and resonance, Valence Shell Electron Repulsion theory (VSEPR), Discussion of structures of H_2O, NH_3, BrF_3, SiF_4, Molecular orbital theory, Linear combination of atomic orbitals (LCAO) method. Structure of simple homo nuclear diatomic molecule like H_2, N_2, O_2, F_2.

3. Thermochemistry: Hess's Law, heat of reaction, effect of temperature on heat of reaction at constant pressure (Kirchoff's Equation) heat to dilution, heat of hydration, heat of neutralization and heat of combustion, Flame temperature.

4. Reaction Kinetics: Significance of rate law and rate equations, order and molecularity, Determinations of order of simple reactions-experimental method, Equilibrium constant and reaction rates-Lindermann, collision and activated complex theories, complex reactions of 1^{st} order characteristics of consecutive, reversible and parallel reactions-Steady state and non-steady state approach.

5. Electron Chemistry: Conductance of electrolytic solutions transference number and its determination, Kohlrausch's Law of in-dependent migration of ions, Interionic attraction theory, activity and activity coefficient of strong electrolytes.

6. Catalysis: Criteria for Catalysis-Homogeneous Catalysis, acid-base, Enzymatic catalysis, Catalysis by metal salts, Heterogeneous catalysis – concept of promoters, inhibitors and poisoning, Physiosorption, Chemisorption, Suface area, Industrially important process. Theories of catalysis.

7. Phase rule: Derivation of phase rule, Significance of various terms involved in the definitions phase diagram of one competent system miscibility, interpolations of two component system diagrams.

Code No.: IT 128		L	T/P	C
PaperID: 15128	Paper: Data Structures	3	0	3

Unit – 1:

Introduction to programming methodologies and design of algorithms. Abstract Data Type, array, array organization, sparse array. Stacks and Stack ADT, Stack Manipulation, Prefix, infix and postfix expressions, their interconversion and expression evaluation. Queues and Queue ADT, Queue manipulation. General Lists and List ADT, List manipulations, Single, double and circular lists.

Unit – 2:

Trees, Properties of Trees, Binary trees, Binary Tree traversal, Tree manipulation algorithms, Expreession trees and their usage, binary search trees, AVL Trees, Heaps and their implementation.

Unit – 3:

Multiway trees, B-Trees, 2-3 trees, 2-3-4 trees, B* and B+ Trees. Graphs, Graph representation, Graph Traversal.

Unit – 4:

Sorting concept, order, stability, Selection sorts (straight, heap), insertion sort (Straight Insertion, Shell sort), Exchange Sort (Bubble, quicksort), Merge sort (only 2-way merge sort). Searching – List search, sequential search, binary search, hashing concepts, hashing methods (Direct, subtraction, modulo-division, midsquare, folding, pseudorandom hashing), collision resolution (by open addressing: linear probe, quadratic probe, pseudorandom collision resolution, linked list collision resolution), Bucket hashing.

Text:

[1] R. F. Gilberg, and B. A. Forouzan, "Data structures: A Pseudocode approach with C", Thomson Learning.

[2] A .V. Aho, J . E . Hopcroft, J . D . Ulman "Data Structures and Algorithm", Pearson Education.

Reference

[2] S. Sahni and E. Horowitz, "Data Structures", Galgotia Publications.

[3] Tanenbaum: "Data Structures using C", Pearson/PHI.

[4] T .H . Cormen, C . E . Leiserson, R .L . Rivest "Introduction to Algorithms", PHI/Pearson.

[5] V . Manber "Introduction to Algorithms – A Creative Approach", Pearson Education.

[6] Ellis Horowitz and Sartaz Sahani "Fundamentals of Computer Algorithms", Computer Science Press.

Practicals:

Code: BA156		**L**	**T/P**	**C**
Paper ID:99156	**Paper: Physics– II Lab.**	**0**	**2**	**1**

Practicals based on BA110.

Code: BA162		**L**	**T/P**	**C**
Paper ID:99162	**Paper: Chemistry– II Lab.**	**0**	**2**	**1**

Practicals based on BA118.

Code: IT152		**L**	**T/P**	**C**
Paper ID:15152	**Paper: Data Structure Lab.**	**0**	**2**	**1**

Practicals based on IT128.

Code: IT154		**L:0**	**T/P**	**C**
Paper ID:15154	**Paper: Engineering Graphics Lab.**	**0**	**2**	**1**

Basic Concepts

I. S. drawing conventions, line symbols, kinds of line, drawing sheet lay-out, rules of printing, preferred scales.

2. Projections

Perspective, orthographic, isometric and oblique projections, isometric scale, isometric drawing, Technical sketching.

3. Shape Description (External)

Multiplanar representation in first- and third angle systems of projections, glass-box concept, sketching of orthographic views from pictorial views, precedence of lines.

Sketching of pictorial (isometric and oblique) views from Multiplanar orthographic views, Reading exercises, Missing line and missing view exercises.

4. Shape Description (Internal)

Importance of sectioning, principles of sectioning, types of sections, cutting plane representation, section lines, conventional practices.

5. Size Description

Dimensioning, tools of dimensioning, Size and location dimensions, Principles of conventions of dimensioning, Dimensioning exercises.

6. Computer Aided Drafting

Basic concepts and use.

Paper ID: 15201		L	T	C
Paper Code: IT201	Paper: Computational Methods	3	1	4

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

Unit – 1:

Errors in computation, Review of Taylor Series, Mean Value Theorem. Representation of numbers (integers and Floating Point). Loss of Significance in Computation.

Location of Roots of functions and their minimization: Bisection method (convergence analysis and implementation), Newton Method (convergence analysis and implementation), Secant Method (convergence analysis and implementation). Unconstrained one variable function minimization by Fibonnaci search, Golden Section Search and Newton's method. Multivariate function minimization by the method of steepest descent, Nelder- Mead Algorithm.

Unit – 2:

Interpolation and Numerical Differentiation: Interpolating Polynomial, Lagrange Form, Newton Form, Nested Form, Inverse Interpolation, Neville's Algorithm, Errors in interpolation, Estimating Derivatives and Richardson Extrapolation.

Numerical Integration: Definite Integral, Riemann – Integrable Functions, Traezoid Rule, Romberg Algorithm, Simpson's Scheme, Gaussian Quadrature Rule.

Unit – 3:

Linear System of Equations: Conditioning, Gauss Elimination, Pivoting, Cholesky Factorization, Iterative Methods, Power Method

Approximation by Spline Function: 1st and 2nd Degree Splines, Natural Cubic Splines, B Splines, Interpolation and Approximation.

Unit – 4:

Differential Equations: Euler method, Taylor series method of higher orders, Rubge – Kutta method of order 2 and 4, Runge – Kutta – Fehlberg method, Adas – Bashforth – Moulton Formula. Solution of Parabolic, Hyperbolic and Elliptic PDEs.

Implementation to be done in C/C++.

Text:

[1] D. Kincaid and W. Cheney, "Numerical Analysis: Mathematics of Scientific Computing", Thomson/Brooks-Cole., 1991.

Reference:

[2] D. Kincaid and W. Cheney, "Numerical Analysis", Thomson/Brooks-Cole., 2002.
[3] R. L. Burden and J. D. Faires, "Numerical Analysis", Thomson/Brooks-Cole, 2001.
[4] W. Y. Yang, W. Cao, T.-S. Chung and J. Morris, "Applied Numerical Methods Using Matlab", Wiley, 2005.
[5] J. H. Mathews and K. D. Fink, "Numerical Methods Using Matlab", Printice Hall, 1999.
[6] S. D. Conte and C. de Boor, "Elementary Numerical Analysis: An Algorithmic Approach", McGraw Hill, 1980.
[7] J. D. Hoffman, "Numerical Methods for Engineers and Scientists", Marcel Dekker Inc., 2001.
[8] J. Stoer and R. Bulirsch, "Introduction to Numerical Analysis", Springer – Verlag, 1993.
[9] W. H. Press, S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, "Numerical Recipes in C", CUP, 2002.
[10] W. Boehm and H. Prautzch, "Numerical Methods", Universities Press, 2005.
[11] C. F. Gerald, and P. O. Wheatly, "Applied Numerical Analysis", Pearson, 1994
[12] H. M. Antia, "Numerical Methods for Scientists & Engineers", Hindustan Book Agency, 2002.

Paper ID: 15203		L	T	C
Paper Code: IT203	Paper: Circuits and Systems	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

Unit – 1:

Review of complex variables: Complex Numbers, Algebra of Complex Numbers, Functions of Complex Variable, Taylor and Laurant Series, Differentiation, Integration, Cauchy Theorem, Residue Theorem.

Unit – 2:

Signals, Classification of Signals, Systems, Classification of Systems, Linear Time Invariant (LTI) Systems; Laplace Transform, z-Transform, Fourier Series and Transform (Continuous and Discrete) and their properties. Laplace Transform and Continuous Time LTI systems, z-Transform and Discrete Time LTI systems, Fourier analysis of signals and systems, State Space Analysis.

Unit – 3:

Circuits: Voltage, Ideal Voltage Source, Current Ideal Current Sources, Classification of Circuits, Ohm's Law, Resistively, Temperature Effect, Resistors, Resistor Power Absorption, Nominal Values and Tolerances, Colour Codes, Open and Short Circuits, Internal Resistance.

DC Circuits: Series and Parallel Circuits, Kirchhoff's Voltage and Current Law, Mesh Analysis, Loop Analysis, Nodal Analysis, Thevenin's and Norton's Theorem, Maximum Power Transfer Theorem, Superposition Theorem, Millman's Theorem, Y - Δ and Δ- Y Transformation, Bridge Circuits.

Unit – 4:

AC Circuits: Circuits containing Capacitors and Inductors, Transient Response, Alternating Current and Voltages, Phasors, Impedences and Admittance, Mesh Analysis, Loop Analysis, Nodal Analysis, Thevenin's and Norton's Theorem, Y - Δ and Δ- Y Transformation, Bridge Circuits. Resonant Circuits, Complex Frequency and Network Function, Two port Networks. Passive Filters.

Text:

[1] B. P. Lathi, "Signal Processing and Linear System", Berkeley Cambridge Press, 1998.
[2] A. H. Robbins and W. C. Miller, "Circuit Analysis: Theory and Practice", Thomson Learning/Delmar Pub., 2007.
[3] A. B. Carlson, "Circuits", Thomson/Brooks-Cole, 2000.

Reference:

[4] S. Haykin and B. V. Veen, "Signal and Systems", John Wiley and Sons, 1999.
[5] H. P. Hsu, "Schaum's Outlines of The Theory and Problems of Signals and Systems", McGraw-Hill, 1995.
[6] S. Madhu, "Linear Circuit Analysis", Prentice Hall, 1988.
[7] S. Ghosh, "Signals and Systems", Pearson Education, 2006.
[8] S. Poornachandra, "Signal and Systems", Thomson Learning, 2004.
[9] M. Nahvi and J. A. Edminister, "Schaum's Outline of Theory and Problems of Electric Circuits", McGraw-Hill, 2003.

Paper ID: 15205		L	T	C
Code No: IT205	Paper : Electronic Devices & Circuits	3	1	4

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

UNIT – 1:

Semiconductor diodes and their applications

Construction, characteristics and working principles of semi conductor diodes: PN junction diode, zener diode, varactor diode, schottky diode, photo diodes, Light emitting diode, Laser diode.

UNIT – 2:

Transistors and Biasing

Construction, operation of NPN & PNP transistor, characteristics, Types of configurations, methods of transistor biasing and stabilization.

UNIT – 3:

Field Effect Transistor

Classification of FET's, construction & working principles of JFET, MOSFET, biasing methods, small signal model parameters.

UNIT – 4:

Linear Integrated Circuits

Differential amplifier circuits, operational amplifiers and its applications,

Oscillators

Concept of Feedback, barkhausen criteria for sinusoidal oscillators, phase shift oscillators, wein bridge & crystal oscillator.

Text/References:

1. B. P. Singh and R. Singh, Electronic Devices & Integrated Circuits, Pearson, 2006.
2. B. Kumar and S. J. Jain, Electronic Devices and Circuits, "Prntice Hall of India, 2007.
3. Boylestad, "Electronic Devices and Circuit Theory", 9th Ed.
4. S.G. Burns, P.R. Bond, "Principles of Electronic Circuits, 2nd Ed., Galgotia
5. M.S. Roden, G.L. Carpenter & W.R.Wieseraman, "Electronic Design", Shroff Publisher & Distributors.
6. B. G. Streetman, Theory & Technology & Semiconductor Devices.
7. Millman & Halkias Electronic Devices & Circuits, TMH(ISE)
8. S. Salivahanan & other, Electronic Devices & Circuits, TMH.
9. Malvino, Electronic Principles, TMH.
10. Jacob Millman, Micro Electronics, TMH.

PaperID:15207			L	T	C
Code: IT207	Paper	: Object Oriented Programming using C++	3	1	4

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

Unit – 1:

Objects, 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.

Unit – 2:

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.

Unit – 3:

Inheritance, Class hierarchy, derivation – public, private & protected; aggregation, composition vs classification hierarchies, polymorphism, categorization of polymorphic techniques, method polymorphism, polymorphism by parameter, operator overloading, parametric polymorphism, generic function – template function, function name overloading, overriding inheritance methods, run time polymorphism.

Unit – 4:

Standard C++ classes, using multiple inheritance, persistant objects, streams and files, namespaces, exception handling, generic classes, standard template library: Library organization and containers, standard containers, algorithm and Function objects, iterators and allocators, strings, streams, manipulators, user defined manipulators, vectors, valarray, slice, generalized numeric algorithm.

Text:

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

References:

1. Rumbaugh et. al. " Object Oriented Modelling & Design", Prentice Hall
2. G . Booch "Object Oriented Design & Applications", Benjamin,Cummings.
3. E.Balaguruswamy, "Objected Oriented Programming with C++", TMH
4. R. Lafore, "Object Oriented Programming using C++", Galgotia.
5. D . Parasons, "Object Oriented Programming with C++",BPB Publication.
6. Steven C. Lawlor, "The Art of Programming Computer Science with C++", Vikas Publication.

PaperID: 15209		L	T	C
Code: IT209	Paper : Computer Graphics	3	1	4

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

Unit – 1:

Basic raster graphics algorithms for drawing 2 D Primitives liner, circles, ellipses, arcs, clipping, clipping circles, ellipses & polygon.

Unit – 2:

Polygon Meshes in 3D, curves, cubic & surfaces, Solid modeling.Geometric Transformation: 2D, 3D transformations, window to viewport transformations, acromatic and color models.
Graphics Hardware: Hardcopy & display techniques, Input devices, image scanners

Unit – 3:

Shading Tech: Transparency, Shadows, Object reflection, Gouraud & Phong shading techniques. Visible surface determination techniques for visible line determination, Z-buffer algorithm, scanline algorithm, algorithm for oct-tres, algorithm for curve surfaces, visible surfaces ray-tracing, recursive ray tracing, radio-city methods.

Unit – 4:

Elementary filtering tech, elementary Image Processing techniques, Geometric & multi-pass transformation mechanisms for image storage & retrieval. Procedural models, fractals, grammar-based models, multi-particle system, volume rendering.

Text:

1. Foley et. al., "Computer Graphics Principles & practice", AWL.

References:

1. R.H. Bartels, J.C. Beatty and B.A. Barsky, "An Introduction to Splines for use in Computer Graphics and Geometric Modeling", Morgan Kaufmann Publishers Inc., 1987.
2. D. Hearn and P. Baker, "Computer Graphics", Prentice Hall, 1986.
3. W. Newman and R. Sproul, "Principles of Interactive Computer Graphics, McGraw-Hill, 1973.
4. R. Plastock and G. Kalley, "Theory and Problems of Computer Graphics", Schaum's Series, McGraw Hill, 1986.
5. F.P. Preparata and M.I. Shamos, "Computational Geometry: An Introduction", Springer-Verlag New York Inc., 1985.
6. D. Rogers and J. Adams, "Mathematical Elements for Computer Graphics", MacGraw-Hill International Edition, 1989.
7. David F. Rogers, "Procedural Elements for Computer Graphics", McGraw Hill Book Company, 1985.
8. Alan Watt and Mark Watt, "Advanced Animation and Rendering Techniques", Addison-Wesley, 1992.

Paper ID: 15211			L	T	P
Code: IT211	Paper	: Data Base Management Systems	3	1	4

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

Unit – 1:

Basic concepts: database & database users, characteristics of the database, database systems, concepts and architecture, date models, schemas & instances, DBMS architecture & data independence, database languages & interfaces, data modelling using the entity-relationship approach. Overview of hierarchical, Network & Relational Data Base Management Systems.

Relational model, languages & systems: relational data model & relational algebra: relational model concepts, relational model constraints, relational algebra, SQL- a relational database language: date definition in SQL, view and queries in SQL, specifying constraints and indexes in sql.

Unit – 2:

Oracle Architecture, Logical Data Structures Physical Data Structure, Instances, Table Spaces, Types of Tablespaces, Internal Memory Structure, Background Processes, Data Types, Roles & Privileges, Stored Procedures, User Defined Functions, Cursors, Error Handling, Triggers.

Unit – 3:

Relational data base design: function dependencies & normalization for relational dataases: functional dependencies, normal forms based on primary keys, (1NF, 2NF, 3NF & BCNF), lossless join and dependency preserving decomposition (4NF, 5NF), domain key normal form.

Unit – 4:

Concurrency control & recovery techniques: concurrency control techniques, locking techniques, time stamp ordering, granularity of data items, recovery techniques: recovery concepts, database backup and recovery from catastrophic failures.

Concepts of object oriented database management systems, Distributed Data Base Management Systems.

Text:

1. Elmsari and Navathe, “Fundamentals of database systems”, Pearson Education

References:

2. Date, C. J., “An introduction to database systems”, 8th Edition, Pearson Education.
3. P. Rob & C. Coronel, “Database Systems: Design Implementation & Management”, Thomson Learning, 2004
4. Date, C. J., “An introduction to database systems”, 3rd Edition, Narosa publishing house.
5. A. V. Silberschatz, H. F. Korth and S. Sudershan, “Database System Concept”, McGraw Hill, 2005.
6. Ullman, J. D., “Principals of database systems”, Galgotia publications.
7. Desai, B., “An introduction to database concepts”, Galgotia publications.

Practicals:

Code: IT251		**L**	**T/P**	**C**
Paper ID:15251	**Paper: Electronic Devices and Circuits Lab.**	**0**	**2**	**1**

Practicals based on IT205.

Code: IT253		**L**	**T/P**	**C**
Paper ID:15253	**Paper: Computation Lab.**	**0**	**2**	**1**

Practicals based on IT201.

Code: IT255		**L**	**T/P**	**C**
Paper ID:15255	**Paper: Object Oriented Programming Lab.**	**0**	**2**	**1**

Practicals based on IT207.

Code: IT257		**L**	**T/P**	**C**
Paper ID:15257	**Paper: Computer Graphics Lab.**	**0**	**2**	**1**

Practicals based on IT207.

Code: IT259		**L**	**T/P**	**C**
Paper ID:15259	**Paper: DBMS Lab.**	**0**	**2**	**1**

Practicals based on IT211.

Paper ID: 15202			L	T	C
Code: IT202	Paper : Java Programming		3	1	4

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

Unit 1:

Overview and characteristics of Java, Java program Compilation and Execution Process Organization of the Java Virtual Machine, JVM as an interpreter and emulator, Instruction Set, class File Format, Verification, Class Area, Java Stack, Heap, Garbage Collection. Security Promises of the JVM, Security Architecture and Security Policy. Class loaders and security aspects, sandbox model

Unit 2:

Java Fundamentals, Data Types & Literals Variables, Wrapper Classes, Arrays,Arithmetic Operators, Logical Operators, Control of Flow, Classes and Instances, Class Member Modifiers Anonymous Inner Class Interfaces and Abstract Classes, inheritance, throw and throws clauses, user defined Exceptions , The StringBuffer Class ,tokenizer,applets, Life cycle of applet and Security concerns

Unit 3:

Threads: Creating Threads, Thread Priority,Blocked States, Extending Thread Class, Runnable Interface, Starting Threads,Thread Synchronization, Synchronize Threads, Sync Code Block, Overriding Synced Methods, Thread Communication, wait, notify and notify all.

AWT Components, Component Class, Container Class, LayoutManager Interface Default Layouts, Insets and Dimensions, BorderLayout, FlowLayout, GridLayout, CardLayout GridBagLayout AWT Events, Event Models, Listeners,Class Listener,Adapters, ActionEvent Methods FocusEvent KeyEvent,Mouse Events,WindowEvent

Unit 4:

Input/OutputStream, Stream Filters,Buffered Streams,Data input and OutputStream, PrintStream RandomAccessFile, JDBC (Database connectivity with MS-Access, Oracle, MS-SQL Server), Object serialization, Sockets, development of client Server applications, design of multithreaded server. Remote Method invocation, Java Native interfaces, Development of a JNI based application.
Collection API Interfaces, Vector, stack, Hashtable classes, enumerations, set, List, Map, Iterators .

Text/References

1. "Java-2 the complete Reference" by Patrick Naughton and Herbertz Schidt.
2. Head first Java,Sierra & bates , O'reilly
3. "Programming with Java" by E Balaguruswamy.
4. Horstmann, "Computing Concepts with Java 2 Essentials", John Wiley.
5. Decker & Hirshfield, "Programming.Java", Vikas Publication.

Paper ID: 15204		L	T/P	C
Code: IT204	Paper: Multimedia Applications	3	1	4

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

Unit - 1

Concept of Multimedia ,Media & data stream, main properties of multimedia system ,
Data stream characteristics &for continuous media Multimedia Applications, Hardware Software requirements, Storage Technologies: RAID, Optical Media.

Unit - 2

Text, Basic sound concepts , MIDI , Speech ,Basic concept of Images, Graphics format ,Basic concepts of Video & animation, Conventional system,Computer based animation, Authoring Tools, Categories of Authoring Tools.

Unit - 3

Lossless and Lossy compression, Run length coding, Statistical Coding, Transform Coding, JPEG, MPEG, Text compression using static Huffmann technique, Dynamic Huffmann Technique, Arithmetic Technique.

Introduction, Basic Terminology techniques, tweaning & morphing, Motion Graphics 2D & 3D animation.

Unit - 4

Introduction to MAYA(Animating Tool):
Fundamentals, Modeling: NURBS, Polygon, Organic,
Animation:Key frame animation,reactive animation,path animation,Skelton animationetc., deformers..
Dynamics: soft bodies, Rigid bodies and its usages in the scene etc.,
Rendering: soft,Hard renering. IPR rendering, Line and box rendering etc.,
Special Effects: Shading & Texturing Surfaces, Lighting, Special effects.
Working with MEL: Basics & Programming

Text Books:

1. David Hillman, “Multimedia Technology & Applications”, Galgotia Publications.
2. Steinmetz “Multimedia Computing Communication and Application” Pearson Edn.
3. Andleigh and Thakarar “Multimedia System Design” PHI

Reference

1. Nigel Chapman & Jenny Chapman, “Digital Multimedia”, Wiley Publications.
2. D.P. Mukherjee, “Fundamentals of Computer Graphics and Multimedia”, PHI.
3. Maya manuals.

Paper ID: 15206		**L**	**T**	**C**
Code: IT206	**Paper: Switching Theory and Logic Design**	**3**	**1**	**4**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

Unit – 1:
Analog & Digital signals, AND, OR, NOT, NAND, NOR & XOR gates, Boolean algebra.

Standard representation of Logical functions, K-map representation and simplification of logical functions, Quinn-McClusky's Algorithm, Don't care conditions, X-OR & X-NOR simplification of K-maps.

Unit – 2:
Combinational circuits: Multiplexers, demultiplexers, Decoders & Encoders, Adders & Subtractors, Code Converters, comparators, decoder/drivers for display devices

Flip Flops: S-R, J-K, D & T Flip-flops, excitation table of a flip-flop, race around condition.

Unit – 3:
Sequential circuits: Shift registers, Ripple counter, Design of Synchronous counters and sequence detectors.

555 Timer and its application as mono-stable and astable multi-vibrator. Nyquist Sampling Theorem, A/D and D/A converters : Binary-weighted DAC, R-2R Ladder type networks, Successive-approximation ADC, Linear-ramp ADC, Dual-slope ADC

Unit – 4:
Bipolar-Transistor Characeristics, RTL and DTL circuits, TTL, ECL and C MOS Logic families.

Logic Implementations using ROM, PAL & PLA., Semiconductor Memories: Memory organization & operation, classification and characteristics of memories, RAM, ROM and content addressable memory.

Text/References:

1. R.P. Jain, "Modern Digital Electronics", TMH, 2nd Ed,
2. Malvino and Leach, "Digital principles and applications", TMH
3. Morris Mano, "Digital Design", PHI, 2nd Ed.
4. R. J. Tocci, "Digital Systems", PHI, 2000
5. I. J. Nagrath, "Electronics, Analog & Digital", PHI, 1999.
6. J. M. Yarbrough, "Digital Logic-Application and Design", PWS Publishing.
7. B. S. Nai, " Digital Electronics and Logic Design", PHI
8. Balabanian and Carlson, "Digital Logic Design Principles", Wiley Pub.

Paper ID: 15208			L	T/P	C
Code: MS208	Paper	: Organization Behaviour	3	1	4

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

Introduction: Meaning and nature of management; management systems and processes, Tasks and responsibilities of a professional manager; Managerial skills.

Organization Structure and Process: Organizational climate and culture, Management ethos; Organizational Structure and Design: Managerial Communication; Planning process; Controlling.

Behavioural Dynamics: Individual detgerminants of Organization Behaviour; Perceptions, Learning, Personality, Attitudes and Values, Motivation; Stress and its management.

Interactive Aspects of Organizational Behaviour; Analysing inter-personal relations; Group Dynamics; Management of Organizational Conflicts; Leadership Styles.

Decision Making: Organizational Context of Decisions, Decision Making Models; Problem Solving and Decision Making.

References:

1. Luthans Fred., "Organizational Behaviour", McGraw Hill, 1998.
2. Robbins (4th ed.), "Essentials of organizational behaviour", Prentice Hall of India Pvt. Ltd., New Delhi, 1995.
3. Hersey and Blanchard (6th ed.), "Management of organizational behaviour: utilising human resources", Prentice Hall of India Pvt. Ltd., New Delhi, 1996.
4. Dwivedi, R. S., "Human relations and organizational behaviour: a global perspective", Macmillan India Ltd., Delhi, 1995.
5. Arnold, John, Robertson, Ivan t. and Cooper, Cary, l., "Work psychology: understanding human behaviour in the workplace", Macmillan India Ltd., Delhi, 1996.

Paper ID: 15210			L	T/P	C
Code: IT210	Paper	: Foundations of Computer Science	3	1	4

INSTRUCTIONS TO PAPER SETTERS:		Maximum Marks : 60
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 20 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 10 marks	

Unit – 1:

Formal Logic: Statement, Symbolic Representation and Tautologies, Quantifiers, Predicates and validity, Normal forms. Propositional Logic, Predicate Logic. Direct Proof, Proof by Contraposition, Proof by exhausting cases and proof by contradiction.

Sets, Subsets, powersets, binary and unary operations on a set, set operations/set identities, fundamental counting principles, principle of inclusion and exclusion, pigeonhole principle, permutation and combination, pascal's triangles, binominal theorem. Relation, properties of binary relation, closures, partial ordering, equivalence relation, properties of function, composition of function, inverse, Permutation function, composition of cycles. Discrete Function Counting Theorem.

Unit – 2:

Lattices: definition, sublattices, direct product, homomorphism, definition of Boolean algebra, properties, isomorphic structures (in particulars, structures with binary operations) subalgebra, direct product and homo-morphism, Boolean function, Boolean expression, representation & minimization of Boolean function.

Principle of Well Ordering, principle of mathematical induction, principle of complete induction. Recursive definitions, solution methods for linear, first-order recurrence relations with constant coefficients, Analysis of Algorithms involving recurrence relations – comparison based sorting and searching algorithms, solution method for a divide-and-conquer recurrence relation. Growth of Functions, Masters theorem.

Unit – 3:

GCD, LCM, Fundamental Theorem of Arithmetic, primes, Congruences, Euler ϕ function, Fermat's Little Theorem, Euler's Generalization of FLT, Wilson's Theorem, The functions τ and σ, Mobius μ function, Arithmetic Functions, primitive roots, Quadratic congruences and quadratic reciprocity law, Primality and Factoring, Simple Cryptosystems, RSA Cryptosystem. Groups, Group identity and uniqueness, inverse and its uniqueness, isomorphism and homomorphism, subgroups, Cosets and Lagrange's theorem, Permutation group and Cayley's theorem (without proof), Error Correcting codes and groups, Normal subgroup and quotient groups.

Unit – 4:

Graph Terminology, Isomorphism, Isomorphism as relations, Cut-Vertices, Menger's Theorem, Planar graphs, Euler's formula (proof), four color problem (without proof) and the chromatic number of a graph, Euler graphs, Hamiltonian graphs, five color theorem, Vertex Coloring, Edge Colouring. Trees terminology, in order, preorder & post order trees traversal algorithms, directed graphs, Computer representation of graphs, Shortest path and minimal spanning trees and algorithms, Depth-first and breadth first searchs, trees associated with DFS & BFS, Connected components. Complexity Analysis and proof of correctness of the graph MST, traversal and Shortest path algorithms.

Text/Reference:

[1] J.P. Tremblay & R. Mamohan, "Discrete Mathematical Structure with Application to Computer Science," TMH, New Delhi (2000).
[2] Kolman, Busby & Ross "Discrete Mathematical Structures", PHI/Pearson.
[3] D.S. Malik and M. K. Sen, "Discrete Mathematical Structures", Thomson Learning, 2006.
[4] C.L.Liu, "Elements of Discrete Mathematics", McGraw Hill Book Company.
[5] G. Haggard,J. Schlipf and S. Whitesides, "Discrete Mathematics for Computer Science", Thomson Learning, 2006.
[6] J. L. Hein, "Discrete Structures, Logic and Computability", Narosa, 2002.
[7] Neal Koblitz, "A course in number theory and cryptography", Springer – Verlag, 1994.
[8] V. Shoup, "A Computational Introduction to Number Theory and Algebra", CUP, 2005.
[9] John F. Humphreys, "A Course in Group Theory", OUP, 2001.
[10] G. Chartrand, P. Zhang, "Introduction to graph theory", TMH, 2005.
[11] A .V. Aho, J . E . Hopcroft, J . D . Ulman "The Design & Analysis of Computer Algorithms", Pearson Education.
[12] T .H . Cormen, C . E . Leiserson, R .L . Rivest "Introduction to Algorithms", PHI/Pearson.
[13] V . Manber "Introduction to Algorithms – A Creative Approach", Pearson Education.
[14] Ellis Horowitz and Sartaz Sahani "Fundamentals of Computer Algorithms", Computer Science Press.
[15] Iyengar, Chandrasekaran and Venkatesh, "Discrete Mathematics", Vikas Publication.

Paper ID: 15212			L	T/P	C
Code: IT212	Paper	: Software Engineering	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

UNIT – 1:

Introduction:

Software Crisis, Software Processes, Software life cycle models: Waterfall, Prototype, Evolutionary and Spiral models, Overview of Quality Standards like ISO 9001, SEI-CMM.

Software Metrics:

Size Metrics like LOC, Token Count, Function Count, Design Metrics, Data Structure Metrics, Information Flow Metrics.

UNIT – 2:

Software Project Planning:

Cost estimation, static, Single and multivariate models, COCOMO model, Putnam Resource Allocation Model, Risk management.

Software Requirement Analysis and Specifications:

Problem Analysis, Data Flow Diagrams, Data Dictionaries, Entity-Relationship diagrams, Software Requirement and Specifications, Behavioural and non-behavioural requirements, Software Prototyping.

UNIT – 3:

Software Design:

Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, User Interface Design.

Software Reliability:

Failure and Faults, Reliability Models: Basic Model, Logarithmic Poisson Model, Calender time Component, Reliability Allocation.

UNIT – 4:

Software Testing:

Software process, Functional testing: Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing: Path testing, Data flow and mutation testing, unit testing, integration and system testing, Debugging, Testing Tools & Standards.

Software Maintenance:

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

Text:

1. R. S. Pressman, "Software Engineering – A practitioner's approach", 3rd ed., McGraw Hill Int. Ed., 1992.
2. K.K. Aggarwal & Yogesh Singh, "Software Engineering", New Age International, 2001

Reference:

1. R. Fairley, "Software Engineering Concepts", Tata McGraw Hill, 1997.
2. P. Jalote, "An Integrated approach to Software Engineering", Narosa, 1991.
3. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN, 1996.
4. James Peter, W Pedrycz, "Software Engineering", John Wiley & Sons
5. I. Sommerville, "Software Engineering ", Addison Wesley, 1999.

Practicals:

Code: IT252		L	T/P	C
Paper ID:15252	**Paper: Java ProgrammingLab.**	**0**	**2**	**1**

Practicals based on IT202.

Code: IT254		L	T/P	C
Paper ID:15254	**Paper: Multimedia Lab.**	**0**	**2**	**1**

Practicals based on IT204.

Code: IT256		L	T/P	C
Paper ID:15256	**Paper: Switching Theory and Logic Design Lab.**	**0**	**2**	**1**

Practicals based on IT206.

Code: IT258		L	T/P	C
Paper ID:15258	**Paper: Software Engineering Lab.**	**0**	**2**	**1**

Practicals based on IT212.

Code: IT 301 **L:3 T/P:1 C: 4**

Paper ID: 15301 **Paper: Theory of Computation**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

Unit I

Automata and Language Theory: Chomsky Classification, Finite Automata, Deterministic Finite Automata (DFA), Non-Deterministic Finite Automata (NFA), Regular Expressions, Equivalence of DFAs, NFAs and Regular Expressions, Closure properties of Regular grammar, Non-Regular Languages, Pumping Lemma.

Unit II

Context Free Languages: Context Free Grammar (CFG), Parse Trees, Push Down Automata (deterministic and non-deterministic) (PDA), Equivalence of CFGs and PDAs, Closure properties of CFLs, Pumping Lemma, Parsing, LL(K) grammar.

Unit III

Turing Machines and Computability Theory: Definition of Turing Machine, Extensions of Turing machines, Non – deterministic Turing machines, Equivalence of various Turing Machine Formalisms, Church – Turing Thesis, Decidability, Halting Problem, Reducibility, Recursion Theorem.

Unit IV

Complexity Theory: Time and Space measures, Hierachy theorems, Complexity classes P, NP, L, NL, PSPACE, BPP and IP, complete problems, P versus NP conjecture, quantiers and games, provably hard problems, relativized computation and oracles, probabilistic computation, interactive proof systems.

Text:

1. M. Sipser, "Introduction to the Theory of Computation", Thompson Press, 2006.
2. J. Hopcroft, R. Motwani, and J. Ullman, "Introduction to Automata Theory, Language and Computation", Pearson, 2nd Ed, 2006.

References:

1. H. R. Lewis and C. H. Papadimitriou, "Elements of the Theory of Computation", Pearson, 2nd Ed, 1997.
2. D. Cohen, "Introduction to Computer Theory, Wiley, N. York, 2nd Ed, 1996.
3. J. C. Martin, "Introduction to Languages and the Theory of Computation", TMH, 2nd Ed. 2003.
4. K. L. Mishra and N. Chandrasekharan, "Theory of Computer Science", PHI, 1996.

Code: IT 303 **L:3 T/P:1 C: 4**

Paper ID: 15303 **Paper: Analog & Digital Communications**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

Unit I

Introduction: Block diagram of Electrical communication system, Radio communication: Types of communications, Analog, pulse and digital, Types of signals, Fourier transform for various signals, Fourier spectrum, Power spectral density, Auto correlation, convolution.

Amplitude Modulation : Need for modulation, types of AM Methods (AM,DSBSC, SSBSC), power and bandwidth requirements, generation and demodulation of AM: Diode detector, product detector, product demodulation for DSBSC&SSBSC.

Unit II

Angle modulation: Frequency and phase modulations, advantages of FM over AM, Bandwidth consideration, Narrow band and Wide band FM, comparison of FM&PM Pulse Modulations: Sampling, Nyquist rate of sampling, samping theorem for band limited signals, PAM, regeneration of baseband signal, PWM&PPM, Time division Multiplexing, FDM, Asynchronous Multiplexing.

Unit III

Digital communication: Advantages, Block diagram of PCM, Quantization, Effect of Quantization, Quantization error, Base band digital signal, DM,ADM,ADPCM and comparison.

Digital modulation: ASK,FSK,PSK,DPSK,QPSK and QAM demodulation, coherent and incoherent reception, Modems.

Unit IV

Information theory : Concept of Information, Rate of information and entropy, Source coding for optimum rate of information, Coding efficiency, Shannon_Fano and Huffman coding. noise, noise temperature, S/N ratio & Noise figure.S/N trade off.

Error control coding: Introduction, Error detection and correction codes, block codes and convolution codes.

Text:

1. W. Tomasi, "Electronic communications systems(baics through advanced)", Pearson Education, 2th ed, 2004.
2. H. Taub and D. L. Schilling, "Principles of Communication Systems", TMH, 2003.

Reference:

1. J. C. Hancock, "An Introduction to the Principles of Communication Theory", McGraw Hill, 1961.
2. S. Haykins, "Introduction to Analog and Digital Communication", Wiley, 1986.
3. G. Kennedy and B. Davis, "Electronic communication systems", TMH, 1993.
4. J. G. Proakis, M. S.alehi, "Communications Systems Engineering", PHI, 2nd ed, 2002.
5. D. Roddy and J. Coolen, "Electronic Communications", PHI, 1995.
6. S. Haykins, "Communication Systems", Wiley, 2001.

Code: IT 305 **L:3 T/P:1**
C: 4
Paper ID: 15305 **Paper: Computer Architecture**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

Unit I

Computer Arithmetic and Register transfer language:

Unsigned notation, signed notation, binary coded decimal, floating point numbers, **IEEE 754 floating point standard**, Micro-operation, Bus and Memory Transfers, Bus Architecture, Bus Arbitration, Arithmetic Logic, Shift Micro operation, Arithmetic Logic Shift Unit.

Unit II

Instruction set architecture & computer organization

Levels of programming languages, assembly language instructions, **8085 instruction set architecture**, Instruction Codes, Computer Registers, Computer Instructions, Timing & Control, Instruction Cycle, Memory Reference Instructions, Input-Output and Interrupts

Unit III

Control Design:

Instruction sequencing & interpretation, Hardwired & Micro Programmed (Control Unit), Micrprogrammed computers, Micro coded CPU: Pentium processor

CPU Design

Specifying a CPU, Design & implementation of simple CPU, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, **Internal architecture of 8085 microprocessor**.

Unit IV

Memory organization

Memory Technology, Main Memory (RAM and ROM Chips), Virtual memory, High-speed memories

Input/Output organization

Asynchronous Data Transfers, Programmed I/O, interrupts, Direct memory Access, Serial communication, UARTs, **RS-232-C & RS-422** standard

Text:

1. J. D. Carpinelli, "Computer Systems Organization and Architecture", Pearson Education, 2006.
2. J. P. Hayes, "Computer Architecture and Organization", McGraw Hill, 1988.

Reference:

1. J. L Hennessy and D. A. Patterson, "Computer Architecture: A quantitative approach", Morgon Kauffman, 1992.
2. W. Stallings, "Computer organization and Architecture", PHI, 7th ed, 2005.
3. B. Parhami, "Computer Architecture: From Microprocessors to Supercomputers", Oxford University press, 2006.

Code: IT 307 **L:3 T/P:1 C: 4**
PaperID: 15307 **Paper : Digital Signal Processing**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**
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 20 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 10 marks

Unit I

Signals and signal Processing: Characterization & classification of signals, typical Signal Processing operations, example of typical signals, typical Signals Processing applications.

Time Domain Representation of Signals & Systems: Discrete Time Signals, Operations on Sequences, the sampling process, Discrete-Time systems, Time-Domain characterization of LTI Discrete-Time systems.

Unit II

Transform-Domain Representation of Signals: Discrete Fourier Transform (DFT), DFT properties, computation of the DFT of real sequences, Linear Convolution using the DFT. Z-transforms, Inverse z-transform, properties of z-transform.

Unit III

Computation of the Discrete Fourier Transform: Computational complexity of the direct computation of the DFT, different approaches for reducing the computations, Decimation-in-Time FFT algorithms, Decimation-in-frequency FFT algorithms.

Unit IV

Digital Filter Structure: Block Diagram representation, Signal Flow Graph Representation, Signal Flow Graph Representation, FIR Digital Filter Structure, IIR Filter Structures, Parallel all pass realization of IIR Filter design based on Frequency Sampling approach.

Text / Reference:

1. A. Y. Oppenhein and R. W. Schater, "Digital Signal Processing", PHI 1975.
2. Sanjit K. Mitra, "Digital Signal Processing: A Computer based approach", TMH, 2005.
3. J. G. Proakis and D.G. Manolakis, "Digital Signal Processing, Principals, Algorithms, and Applications", Pearson Education, 4th ed., 2007.
4. A. Y. Oppenhein, R. W. Schater and J. R. Buck, "Discrete Time Signal Processing", PHI 1999.

Code No.: IT 309 **L:3 T/P:1 C: 4**
PaperID: 15309 **Paper: Object Oriented Software Engineering**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**
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 20 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 10 marks

Unit I

Introduction to Software Engineering: Software Engineering Development, Software Life Cycle Models, Standards for developing life cycle models.

Object Methodology & Requirement Elicitation: Introduction to object Oriented Methodology, Overview of Requirements Elicitation, Requirements Model-Action & Use cases, Requirements Elicitation Activities, Managing Requirements Elicitation.

Unit II

Architecture: Model Architecture, Requirements Model, Analysis Model, Design Model, Implementation Model, Test Model

Unit III

Modeling with UMLZ: Basic Building Blocks of UML, A conceptual Model of UML, Basic Structural Modeling , UML Diagram

System Design: Design concepts & activities, Design Models, Block design, Testing

Unit IV

Testing Object Oriented Systems: Introduction, Testing Activities & Techniques, The Testing Process, Managing Testing

Case Studies

Text Books:

1. I. Jacobson, "Object-Oriented Software Engineering: A Use Case Driven Approach", Pearson, 1992
2. B. Breugge and A. H. Dutoit, "Object Oriented Software Engineering: Using UML, Patterns, and Java", Prentice Hall, 2004.
3. G. Booch, J. Rumbaugh and I. Jacboson, "The Unified Modeling Language User Guide" Addison-Wesley, 2005.

Code No.: IT 311 **L:3 T/P:1 C: 4**
PaperID: 15311 **Paper: Digital Design using VHDL**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**
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 20 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 10 marks

Unit I
Introduction to HDLs, Design Flow, Synthesis, VHDL Basics, Data types, Opertors, concurrent coding, Structural and Behavioral Modeling, Design of Adder, Subtractor, Decoder, Encoder, Code converter, Multiplexer, VHDL for Combinational Circuits Blocks

Unit II
Sequential Code, Control Structure, Attributes, VHDL for Flip – Flops, Registers, Counters, Signals and Variable, Bus Structure, Implementation of Bus Structure using Multiplexer, Implementation of simple processor

Unit III
State Machine, State diagram, state table, state assignment, RTL for state Machine Design Styles, Mealy State Model, Specificatin of Mealy FSM using VHDL, VHDL for Moore type FSM, Specify the state assignment in VHDL code, Design of Serial adder using FSM.

Unit IV
Design and Implementation of Arbiter Circuit, Algorithm State Machine Charts, VHDL for SRAM, VHDL Design for Shift-and –add Multiplier, VHDL Design of Floating point Adder circuit, VHDL timing, modeling medeling with Delta time Delays, Inertial/Transport Delay

Text:

1. B. Vransesic, "Fundamental of Digital Logic Design with VHDL", TMH, 2007.
2. V. A. Pedroni, "Circuit Design with VHDL", PHI, 2005

References:

1. B. Cohen, "VHDL coding Styles and Methodologies", Springer, 2005
2. C. H. Roth, "Digital System Design using VHDL", Thomson Learning 2005
3. J F Wakerly, "Digital Design Principles and Practice" , Pearson Education Press 2007
4. S. Ghose, "Hardware Description Languages", PHI 2005
5. P.J. Ashendern, "The Designer Guide to VHDL", Morgan Kaufmann, 2005
6. D J Smith , "HDL Chip Design", Don Publisher, 2005
7. D. L. Perry, "VHDL programming", TMH, 2005
8. K.C. Chang and M Loeb, "Digital Systems Design with VHDL and Synthesis", Wiley, 2005
9. J. Bhaskar , "A VHDL Synthesis Primer", BSP, 2006.
10. J. Bhaskar, "A VHDL Primer", Pearson Education, 2005
11. S. Lee, "Advanced Digital Logic Design Using VHDL, State Machines, and Synthesis for FPGA's", Morgan Kaufmann, 2007

Code No.: IT 302 **L:3 T/P:1 C: 4**

Paper ID: 15302 **Paper: Microprocessors**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

Unit I

Introduction – Microprocessors Evolution and types (Intel 4004 – Pentium IV and road maps), Overview of 8085, 8086, 80286, 80386, 80486, Pentium processors and Micontrollers.

Unit II

Architecture of 8086 – Register Organization, Execution unit, Bus Interface Unit, Signal Description, Physical Memory Organization, General Bus Operation, I/O addressing capabilities, Minimum mode and maximum mode timing diagrams, Comparison with 8088

Unit III

8086 programming – Assembly language program development tools (editor, linker, loader, locator, Assembler, emulator and Debugger), Addressing modes, Instruction set descriptions, Assembler directives and operators, Procedures and Macros. (Writing programs for use with an assembler MASM)

Unit IV

8086 Interfacing – Interfacing 8086 with semiconductor memory, 8255, 8254/ 8243, 8251, 8279, A/D and D/A converters. Numeric processor 8087, I/O processor 8089 tightly coupled and loosely coupled systems.

Text:

1. D.V. Hall, "Microprocessors and Interfacing", TMH, 2nd Ed. 1991.
2. Y.-C. Liu and G. A. Gibson, "Microprocessor Systems: The 8086/8088 family Architecture, Programming & Design", PHI, 2000.

References:

1. J. L. Antonakes, "An Introduction to the Intel Family of Microprocessors", Thomson, 1996.
2. K. J. Ayala, "The 8086 microprocessor", Thomson, 1995
3. Peter Able, "IBM PC assembly language programming", PHI, 2000.
4. A. K. Ray and K M Bhurchandi, "Advanced Microprocessors and Peripherals", TMH, 2000.

Paper Code: IT 304 **L:3 T/P:1 C: 4**
PaperID:15304 **Paper: Computer Networks**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

Unit I

Introduction: Uses of Computer Networks, Network and Protocol Architecture, Reference Model (ISO-OSI, TCP/IP-Overview

Physical Layer: Data and signals, Transmission impairments, Data rate limits, performance factors, Transmission media, Wireless transmission, Telephone system (Structure, trunks, multiplexing & Switching)

Unit II

Data Link Layer: Design issues, Error detection & correction, Data Link Protocols, sliding window protocols, HDLC,WAN Protocols.

Unit III

Medium Access Sub layer: Channel allocation problem, multiple access protocols, IEEE standard 802.3 & 802.11 for LANS and WLAN, high-speed LANs, Network Devices-repeaters, hubs, switches bridges.

Unit IV

Network Layer: Design issues, Routing algorithms, congestion control algorithms, Internetwork protocols, Internetwork operation

Text :

1. B. A Forouzan.,"Data Communications & Networking",4th Ed, Tata McGraw Hill, 2007.
2. A. S. Tanenbaum. "Computer networks", Pearson Education, 4th ed , 2006.

References:

1. W. Stallings, "Data and Computer Communications", Pearson Education, 8th Ed, 2007.
2. D. E. Comer., "Computer Networks & Internets", Pearson Education, 4th Ed, 2007
3. N. Olifer and V. Olifer, "Computer Networks", Wiley, 2006
4. L. L. Peterson and B. S. Davie, "Computer Networks",Elsevier,4th Ed, 2007.
5. L. A. Gallo, "Computer Communications & networking technologies", Cengage Learning, India 1st Ed, 2007.

Code: IT 306 **L:3 T/P:1 C: 4**

Paper ID: 15306 **Paper: Algorithm Analysis and Design**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

Unit I

Growth of Functions, Summations, Algorithm Design Paradigms, Sorting in Linear Time: Counting sort, Radix Sort, Bucket Sort, Medians and Order Statistics, Disjoint Set operations, Linked List representation of disjoint sets, disjoint set forests.

Unit II

Matrix Chain Multiplication, Strassen's algorthim for matrix multiplication, LCS, Optimal Binary Search Tree, General Greedy approach Vs Dynamic Programming approachm Case studies: Knapsack problem, Huffman Coding Problem, Matroids

Unit III

Representation of Graphs, Breadth First Search, Depth First Search, Topological Sort, Strongly Connected Components, Algorithms of Kruskal's and Prim's, Dijkstra's and Bellman ford algorithm, All pair shortest path, Flyod Warshall Algorithm

Unit IV

String Matching: The Naïve String Matching Algorithm, The Rabin Karp Algorithm, String Matching with Finite Automata, The Knuth Morris Pratt Algorithm.

NP-Complete Problems: Polynomial Time Verification, NP-Completeness and Reducibility, NP Completeness proof, NP-Complete Problems.

Text:

1. T .H . Cormen, C . E . Leiserson, R .L . Rivest, "Introduction to Algorithms", PHI, 2001.

References:

1. A .V. Aho, J . E . Hopcroft, J . D . Ulman "The Design & Analysis of Computer Algorithms", Addison Wesley, 1998.
2. U . Manber "Introduction to Algorithms – A Creative Approach", Addison Wesley, 1998.
3. E. Horwitz and S. Sahani "Fundamentals of Computer Algorithms", Galgotia, 1998.
4. P. Linz, "An Introduction to Formal Languages and Automata", Narosa Publishing House, 2000.
5. J.E.Hopcroft and J.D.Ullman, "Introduction to Automata Theory, Languages and Computation", Addison Wesley, 1998.
6. K.L.Mishra & N.Chandrasekaran, "Theory of Computer Science", PHI,1996.
7. John C.Martin, "Introduction to Languages and Theory of Computation", TMH, 2001.

Code: IT 308 **L:3 T/P:1 C: 4**
PaperID: 15308 **Paper: Compiler Design**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**
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 20 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 10 marks

Unit I

Compiler Structure: Analysis-synthesis model of compilation, various phases of a compiler, tool based approach to compiler construction.

Lexical analysis: Interface with input parser and symbol table, token, lexeme and patterns, difficulties in lexical analysis, error reporting and implementation. Regular grammar & language definition, Transition diagrams, design of a typical scanner using LEX of Flex.

Unit II

Syntax Analysis: Context free grammars, ambiguity, associability, precedence, top down parsing, top down parsing, recursive descent parsing, transformation on the grammars, predictive parsing LL(1) grammar, Nor LL(1) grammar, Bottom up parsing, operator precedence grammars, LR parsers (SLR, LALR, LR), Design of a typical parser using YACC or Bison.

Unit III

Syntax directed definitions: Inherited and synthesized attributes, dependency graph, evaluation order, bottom up and top down evaluation of attributes, L- and S-attributed definitions. Type checking: type: type system, type expressions, structural and name equivalence of types, type conversion, overloaded function and operators, polymorphic function. Run time system: storage organization, activation tree, activation record, parameter passing symbol table, dynamic storage allocation. Intermediate code generation: intermediate representation, translation of declarations, assignments, Intermediate Code generation for control flow, Boolean expressions and procedure calls, implementation issues.

Unit IV

Code generation and instruction selection: Issues, basic blocks and flow graphs, register allocation, code generation, DAG representation of programs, code generation from DAGS, peep hole optimisation, code generator generators, specification of machine.

Code optimisation: source of optimisations, optimisation of basic blocks, loops, global dataflow analysis, solution to iterative dataflow equations, code improving transformations, dealing with aliases, data flow analysis of structured flow graphs.

Text Book:

1. K. C. Louden, "Compiler Construction, Principle and Practice" Thomson Books, 2006
2. Alfred V. Aho, Ravi Sethi & Jeffrey D. Ullman, "Compilers Priciples, Techniques & Tools". Pearson, 1998.
3. Levine, Mason, and Brown, "Lex & Yacc", O' Reilly, 1998.

References:

1. S. S. Muchnick Harcourt Asra, "Advanced Compiler Design implementation", Morgan Kaufman, 2006.
2. Allen, "Modern Compiler Implementation in C", Cambridge Uty. Press 1997
3. Alan Holub, "Compiler Design in C", PHI, 2004.
4. Vinu V. Das, "Compiler Design using FLEX and YACC" PHI, 2005

Code: IT 310 **L:3 T/P:1 C: 4**

PaperID:15310 **Paper: Operating Systems Design Concept**

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks : 60**

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 20 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 10 marks

Unit I

Introduction to the Operating System: Type of OS: Batch System, Time Sharing System, Real Time System, Multiuser/Single User System, System Calls, System Call Interface.

Function of Operating System: Process Management, Memory Management, File Management, I/O Devices Management, Information Management.

Process Management: Process Concept, Process State, Process Control Block, Process Scheduling, Context Switch, CPU Scheduling, Scheduling Criteria, Scheduling Algorithms, Pre Emptive/ Non Preemptive Scheduling, Threads, Thread Structure.

Unit II

Kernel Design Concepts,

Process Synchronisation: Critical Section Problem, Race Condition, Synchronisation hardware, Semaphores, Classical Problems of Synchronisation.

Deadlocks: Characterisation, Methods for Handling Deadlocks Avoidance, Recovery and Detection.

Unit III

Design of Mini OS: MINIX

Memory Management: contiguous Allocation, External Internal Fragmentation, Paging Segmentation, Segmentation with Paging.

Virtual Memory: Virtual Memory Concept, Demand Paging, Page Replacement, PR Algorithms, Allocation of Frames, Thrashing, Working set Model.

Unit IV

Case study on DOS, Windows 2000, Windows XP, Vista, Linux

Information Management: File Concepts, Access Methods, Directory Structure, Allocation Methods: Contiguous Allocation, Linked Allocation, Indexed Allocation Free Space Management.

Device Management: Disk Structure, Disk Scheduling Algorithms, Disk Management,

Text:

1. Silbershatz and Galvin, "Operating System Concept", Addition Weseley, 2002.
2. Milan Milenkovic, Tata Mcgraw-Hill, 2000 "Operating System " Concepts & Design".
3. Godbole Ahyut "Operating System", PHI, 2003

References:

1. Charles Crowley, "Operating Systems", Tata Mcgraw-Hill Edition
2. A. S. Tannenbaum, "Operating System Concept", Addition Weseley, 2002
3. Flynn, Mchoes, "Understanding Operating System", Thomson Press, Third Edition, 2003

Paper Code: IT-401 **L:3 T/P:1 C:4**
Paper ID: 15401 **Paper: Advanced Computer Networks**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

Unit -I
Review of Physical, Data link layer, TCP/IP: Datalink Protocols; ARP and RARP.

Unit-II
Network Layer: Routing algorithms and protocols, Congestion control algorithm, Router Operation, Router configuration, Internetworking, IP Protocol, IPv6 (an overview), Network layer in ATM Network.
Unit-III
Transport Layer: Transport Service, Transport Protocol (TCP, UDP, ATM AAL layer protocol).

Application layer: Security, DNS, SNMP, RMON, Electronic Mail, WWW.
Unit -IV
Network Security: Firewalls (Application and packet filtering), Virtual Public Network.

Text:
1. Tananbaum A.S., "Computer Networks", 3rd Ed, PHI, 1999.
2. Laura Chappell (ed), "Introduction to Cisco Router Configuration", Techmedia, 1999.

References:
1. Black U., "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.
2. Stallings W., "Computer Communication Networks", PHI.
3 Stallings W., "SNMP, SNMPv2, SNMPv3, RMON 1&2", 3rd Ed., Addison Wesley, 1999.
4. Michael A. Miller, "Data & Network Communications", Vikas Publication.
5. William A. Shay, "Understanding Data Communications & Networks", Vikas Publication.

Paper Code: IT-403 **L:3 T/P:1 C:4**
Paper ID: 15403 **Paper: Software Testing**

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

Unit -I

Introduction: What is software testing and why it is so hard?, Error, Fault, Failure, Incident, Test Cases, Testing Process, Limitations of Testing, No absolute proof of correctness, Overview of Graph Theory.

Unit-II

Functional Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing, Cause Effect Graphing Technique.

Structural Testing: Path testing, DD-Paths, Cyclomatic Complexity, Graph Metrics, Data Flow Testing, Mutation testing.

Unit-III

Reducing the number of test cases:

Prioritization guidelines, Priority category, Scheme, Risk Analysis, Regression Testing, Slice based testing

Testing Activities: Unit Testing, Levels of Testing, Integration Testing, System Testing, Debugging, Domain Testing.

Unit-IV

Object Oriented Testing: Issues in Object Oriented Testing, Class Testing, GUI Testing, Object Oriented Integration and System Testing.

Testing Tools: Static Testing Tools, Dynamic Testing Tools, Characteristics of Modern Tools.

Text:

1. William Perry, "Effective Methods for Software Testing", John Wiley & Sons, New York, 1995.
2. Cem Kaner, Jack Falk, Nguyen Quoc, "Testing Computer Software", Second Edition, Van Nostrand Reinhold, New York, 1993.
3. Boris Beizer, "Software Testing Techniques", Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.
4. Louise Tamres, "Software Testing", Pearson Education Asia, 2002

Reference:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Fifth Edition, McGraw-Hill International Edition, New Delhi, 2001.
2. Boris Beizer, "Black-Box Testing – Techniques for Functional Testing of Software and Systems", John Wiley & Sons Inc., New York, 1995.
3. K.K. Aggarwal & Yogesh Singh, "Software Engineering", New Age International Publishers, New Delhi, 2003.
4. Marc Roper, "Software Testing", McGraw-Hill Book Co., London, 1994.
5. Gordon Schulmeyer, "Zero Defect Software", McGraw-Hill, New York, 1990.
6. Watts Humphrey, "Managing the Software Process", Addison Wesley Pub. Co. Inc., Massachusetts, 1989.
7. Boris Beizer, "Software System Testing and Quality Assurance", Van Nostrand Reinhold, New York, 1984.
8. Glenford Myers, "The Art of Software Testing", John Wiley & Sons Inc., New York, 1979.

Paper Code: IT-405 **L:3 T/P:1 C:4**
Paper ID: 15405 **Paper: Distributed Systems**

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

Unit-I

Fundamentals of Distributed Computing:

Architectural models for distributed and mobile computing systems, Basic concepts in distributed computing.

Distributed Operating Systems:

Overview, network operating systems, Distributed file systems, Middleware, client/server model for computing.

Unit-II

Communication:

Layered protocols, RPC, RMI, Remote objects. Basic Algorithms in Message Passing Systems, Leader Election in Rings, and Mutual Exclusion in Shared Memory, Message Passing, PVM and MPI.

Process Concepts:

Threads, Clients and Servers, Code migration, Agent based systems, Distributed objects, CORBA, Distributed COM.

Unit-III

Synchronization:

Clock synchronization, Logical clocks, Election algorithms, Mutual exclusion, Distributed transactions, Naming concepts, Security in distributed systems

Distributed Databases:

Distributed Data Storage, Fragmentation & Replication, Transparency, Distributed Query Processing and Optimization, Distributed Transaction Modeling and concurrency Control, Distributed Deadlock, Commit Protocols.

Unit-IV

Parallel Processing:

Basic Concepts: Introduction to parallel processing, Parallel processing terminology, Design of parallel algorithms, Design of Parallel Databases, Parallel Query Evaluation.

Text Books:

1. Tannenbaum, A, Maarten Van Steen. Distributed Systems, Principles and Paradigm, Prentice Hall India, 2002
2. Elmarsi, Navathe, Somayajulu, Gupta, "Fundamentals of Database Systems", 4th Edition, Pearson Education, 2007

Reference Books:

1. Tanenbaum, A, "Modern Operating Systems", 2nd Edition, Prentice Hall India, 2001.
2. Singhal and Shivaratri, "Advanced Concepts in Operating Systems", McGraw Hill, 1994
3. Attiya, Welch, "Distributed Computing", Wiley India, 2006
4. Coulouris, Dollimore and Kindberg, "Distributed Systems", Pearson, 2009.

Paper Code: IT-407 **L:3 T/P:1 C:4**
Paper ID: 15407 **Paper: Artificial Intelligence**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

Unit-I

Introduction:

Introduction to intelligent agents

Problem solving:

Solving problems by searching : state space formulation, depth first and breadth first search, iterative deepening

Unit-II

Intelligent search methods:

A* and its memory restricted variants

Production systems:

Design implementation and limitations, case studies

Unit-III

Game Playing:

Minimax, alpha-beta pruning

Knowledge and reasoning:

Propositional and first order logic, semantic networks, building a knowledge base, inference in first order logic, logical reasoning systems

Planning:

STRIPS partial order planning, uncertain knowledge and reasoning, probabilistic reasoning systems, Baysian networks

Unit-IV

Learning from observations:

Inductive learning, learning decision trees, computational learning theory, Explanation
based learning

Applications:

Environmental Science, Robotics, Aerospace, Medical Scioence etc.

Text Book:

1. "AI" by Rich and Knight, Tata McGraw Hill, 1992

Reference Books:

1. "Neural Networks in Computer Intelligence" by KM Fu, McGraw Hill
2. "AI: A modern approach" by Russel and Norvig, Pearson Education

Paper Code: IT-409 **L:3 T/P:1 C:4**
Paper ID: 15409 **Paper: Simulation & Modeling**

INSTRUCTIONS TO PAPER SETTERS:		Maximum Marks : 60
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 20 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 10 marks	

Unit-I

Introduction to Simulation

Definitions of modeling & simulation, Concept of systems & system environment, components of a system, discrete & continuous systems, model of a system, types of models & simulation, Advantages, disadvantages, & pitfalls of simulation

General principles

Concepts in discrete-event simulation, event-driven simulation, world views, list processing

Unit-II

Simulation software

History, Selection process, simulation in high level language(c,c++),desirable software features, general purpose simulation packages

Basic Probability & statistics

Terminology & concepts, Statistical modeling & probability distributions.

Random-Number generation

Properties of random numbers, generation of pseudo-random numbers, techniques for generating random numbers, test for randomness

Unit-III

Random-variate generation

Inverse transform, Direct transform, convlution, Accept-Reject

Queuing models

Characteristics, performance measures, steady-state behaviour, Networks of queues

Input Modeling

Data collection, Identifying distribution, parameter estimation, goodness-of-fit, multivariate & time series input models

Unit-IV

Verification & Validation of simulation models

Model building, verifaction & validation, verifcation of simulation models, calibration & validation of models

Techniques for increasing model validity & credibility

Output analysis

Types of simulations with respect to output analysis, stochastic nature of output data, measures of performance & their estimation, output analysis for termination simulations & steady state simulations

Brief overview of discrete & continuous simulation languages and applications of simulation.

Text:

1. Banks J., Carson S., Nelson B.L.,"Discrete-Event Syatem simulation",4th ed ,Pearson Education,New Delhi,2007
2. Law A.M., Kelton W.D., "Simulation Modeling and analysis",3rd ed,McGraw Hill education,Delhi.

Reference:

1. W. feller, "An introduction to probability theory and its applications," vol 183,wiley eastern Ltd. ND.
2. Gordon. G. System Simulation,PHI ,delhi.

Paper Code: IT-411 **L:3 T/P:1 C:4**
Paper ID: 15411 **Paper: Digital Image Processing**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

UNIT – I

Introduction And Digital Image Fundamentals

The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations.

Image Enhancement in the Spatial Domain

Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothening and Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

UNIT – II

Image Enhancement in the Frequency Domain

Introduction to Fourier Transform and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering.

Image Restoration: A model of The Image Degradation / Restoration Process, Noise Models, Restoration in the presence of Noise Only Spatial Filtering, Pereodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invarient Dedradations, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations.

UNIT – III

Image Compression

Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of Information Theory, Error free comparison, Lossy compression, Image compression standards.

Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region Oriented Segmentation, Motion based segmentation.

UNIT – IV

Representation and Description

Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms.

Object Recoginition: Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods.

TEXT BOOKS:

1.Rafael C. Gonzalez & Richard E. Woods, "Digital Image Processing", 2nd Ed, Pearson Edu, 2004
2.A.K. Jain, "Fundamental of Digital Image Processing", PHI. 2003

REFERENCES:

1. Rosefield Kak, "Digital Picture Processing", 1999
2. W.K. Pratt, "Digital Image Processing", 2000

Paper Code: IT-413 **L:3 T/P:1 C:4**
Paper ID: 15413 **Paper: Front End Design Tools & Web Technologies**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

UNIT-I:

History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, IMAP. HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;, Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

UNIT-II

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX , Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK , Introspection, Using Bound properties, Bean Info Interface, Constrained properties , Persistence, Customizes, Java Beans API, Introduction to EJB's

UNIT-III

Web Servers and Servlets: Tomcat web server, Introduction to Servelets: Lifecycle of a Serverlet, JSDK, The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues, Introduction to JSP: The Anatomy of a JSP Page. JSP Application Design with MVC , JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing Sharing Session and Application Data Memory Usage Considerations

UNIT IV:

Database Access : Database Programming using JDBC, Studying Javax.sql.* package,Accessing a Database from a JSP Page, Application – Specific Database Actions,Deploying JAVA Beans in a JSP Page, Introduction to struts framework..

TEXT BOOK

1. "Internet and world wide web – How to Program", Deitel & Deitel, Goldberg, Pearson Education
2. "Using HTML 4, XML and JAVA", Eric Ladd, Jim O' Donnel, Prentice Hall of India
3. "Java Server Pages ",Hans Bergsten, SPD O'Reilly

REFERENCES

1 "Web Technology", Rajkamal, Tata McGraw-Hill, 2001. KS:
2. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech
3. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH
4. Programming world wide web-Sebesta, Pearson
5. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly

Paper Code: IT-415 **L:3 T/P:1 C:4**
Paper ID: 15415 **Paper: Advanced Java Programming**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

Unit 1 : Distributed Systems for Enterprise and Web-Based Applications , The Challenges of Scalability, Heterogeneity, Security, & Failure , Multi-Tiered Architectures , Messaging & Interfaces , JDBC: Java Database Connectivity , Messaging, Interfaces , RMI: Remote Method Invocation

Unit 2: MVC Architecture, Servlet, Servlet life cycle, web application structure, request response model, JSP pages and its elements JSP Architecture, JSP Page life cycle, Page directive attributes, JSP Tag libraries , JSTL Expression Language (EL) , Writing a Custom Tag Library

Unit 3 Struts, Struts architecture, Struts classes - ActionForward, ActionForm, ActionServlet, Action classes , Understanding struts-config.xml , Struts Tiles , Combining Struts and Tiles, Tiles file structure , Understanding Tiles Definitions and Attributes , Creating a Definition in XML file and deploying , Creating a small application using Tiles

Unit 4 : Distributed System Models , J2EE: JNDI, EJB Entity Beans & Deployment Descriptors , J2EE: EJB Session Beans , Transactions , Web Services , Replication, Localization

Text Books :

1. Ivan Bayross , sharanam shah Java Server Programming , shroff Publishers
2. Holzner , Structs : Essential skills , TMH

References :

1. Coulouris, G., Dollimore, J., & Kindberg, Distributed Systems, Concepts and Design , Pearson Education
2. Joe wigglesworth , McMilan Paula , Java Programming : advanced topic , Thomson

Paper Code: IT-451 **L:0 T/P:2 C:1**
Paper ID: 15451 **Paper: Advanced Computer Network Lab**

Paper Code: IT-461 **L:0 T/P:2 C:1**
Paper ID: 15461 **Paper: Software Testing Lab**

Paper Code: IT-455 **L:0 T/P:2 C:1**
Paper ID: 15455 **Paper: Lab assignments**

This lab will be based on elective paper(s).

Paper Code: IT-457 **L:0 T/P:0 C:5**
Paper ID: 15457 **Paper: Minor Project**

Paper Code: IT-459 **L:0 T/P:0 C:1**
Paper ID: 15459 **Paper: Summer Training Report**

Students will undergo summer training/industry visit/In-house training/In-house project during the summer break after the completion of sixth semester. Report of the same is required to be submitted to the school. Viva-voce examination will be conducted based on the report submitted by the student. A panel of examiner will be appointed by the Dean, USIT.

Paper Code: HS-402 **L:2 T/P:0 C:2**
Paper ID: 15402 **Paper: Technical Writing**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

Unit-I
Writing Skills: Descriptive, Narrative, Argumentive and Discursive, Reflective and Literary-Evaluative Writing.

Technical Writing: Definition, Purpose and Characteristics of Technical Writing.

Unit-II
The Technical Writing Process: Prewriting Stage, The Writing Stage and the Post-writing stage.

Technical Writing Skills: Researching, Summarizing and Outlining, Visual Aids, Definition, Description, Set of Instructions.

Unit-III
Formal Formatting: Arrangement of Formal Elements, Front Material, Format Devices in the Body of Formal Report-Heading, Pagination, End Material—Citations, References and Bibliography, Appendix.

Unit-IV
Technical Writing Applications: Memorandums and Informal Format, Formal Format, Recommendations and Feasibility Reports, Proposals, Progress Reports, Analysis Reports Professional Communication, Letters and Job Applications.

Presentation and Meetings.

Text/References:

1. Forsyth, Sandy and Lesley Hutchison, "Practical Composition", Edinburgh Oliver and Boyd, 1981.
2. Sides, Charles H., "How to Write and Present Technical Information", Cambridge, Cambridge University Press, 1999.
3. Guffey, Mary Ellen, "Business Communication, Cincinnati", South-Western College Publishing, 2000.

Paper Code: IT-404 **L:3 T/P:1 C:4**
Paper ID: 15404 **Paper: Advanced Computer Architecture**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

Unit-I

Parallel computer models:

The state of computing, Classification of parallel computers, Multiprocessors and multicomputers, Multivector and SIMD computers.

Program and network properties:

Conditions of parallelism, Data and resource Dependences, Hardware and software parallelism, Program partitioning and scheduling, Grain Size and latency, Program flow mechanisms, Control flow versus data flow, Data flow Architecture, Demand driven mechanisms, Comparisons of flow mechanisms

Unit-II

Pipelining:

Linear pipeline processor, nonlinear pipeline processor, Instruction pipeline Design, Mechanisms for instruction pipelining, Dynamic instruction scheduling, Branch Handling techniques, branch prediction, Arithmetic Pipeline Design, Computer arithmetic principles, Static Arithmetic pipeline, Multifunctional arithmetic pipelines

Unit-III

Arithmetic for computers

Signed and unsigned Numbers, Addition and Subtraction, Multiplication, Division, Floating Point.

CPU Performance and Its factors, Evaluating performance of CPU.

Unit – IV

Memory Hierarchy

Introduction, The basics of Cache, Measuring and Improving of Cache Performance, Virtual Memory, Common framework for memory hierarchies

Case study of PIV and AMD opteron memory hierarchies

Text Books:

1. Kai Hwang, “Advanced computer architecture”; TMH. 2000
2. D. A. Patterson and J. L. Hennessey, “Computer organization and design”, Morgan Kaufmann, 2nd Ed. 2002

Reference Books:

1. J.P.Hayes, “computer Architecture and organization”; MGH. 1998
2. Harvey G.Cragon,”Memory System and Pipelined processors”; Narosa Publication. 1998
3. V.Rajaranam & C.S.R.Murthy, “Parallel computer”; PHI. 2002
4. R.K.Ghose, Rajan Moona & Phalguni Gupta, “Foundation of Parallel Processing”, Narosa Publications, 2003
5. Kai Hwang and Zu, “Scalable Parallel Computers Architecture”, MGH. 2001
6. Stalling W, “Computer Organisation & Architecture”, PHI. 2000
7. D.Sima, T.Fountain, P.Kasuk, “Advanced Computer Architecture-A Design space Approach,”Addison Wesley,1997.
8. M.J Flynn, “Computer Architecture, Pipelined and Parallel Processor Design”; Narosa Publishing. 1998
9. D.A.Patterson, J.L.Hennessy, “Computer Architecture :A quantitative approach”; Morgan Kauffmann feb,2002.
10. Hwan and Briggs, “ Computer Architecture and Parallel Processing”; MGH. 1999

Paper Code: IT-406 **L:3 T/P:1 C:4**
Paper ID: 15406 **Paper: Control Systems**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

Unit I

Definitions of Control Systems, Closed Loop and Open Loop Control, Examples of Control Systems; Laplace Transformation and Solution of Differential Equations; Concept of Mathematical model, Linear and Non-Linear Systems, Transfer Function with Simple Examples; Deriving transfer function of physical systems (Mechanical Translational Systems), Armature controlled and field controlled DC servomotors; AC servomotors and deriving their transfer functions; Block Diagram representation and Simplification.

Unit II

Signal Flow graph, Mason gain formula; Basic Control Actions: Proportional, integral and Derivative controllers, effect of feedback on control system; Transient and steady state response of first order system; Second order system, transient; Routh's Stability criterion, relative stability analysis; Static error co-efficients, position, velocity and acceleration error co-efficients.

Unit III

Root Locus Tecniques Bode Diagram, Minimum and Non-Minimum phase systems; Determination of Transfer from Bode Diagram; Polar Plots; Nyquist Plot; Stability Analysis using; Constant M & N Ioci.

Unit IV

Introduction to Compensators; Definitions of state, state variables, state space, representation of systems; Solution of time invariant, homogeneous state equation, state transition matrix and its properties; Z transform and solution of different equation; Transducers, synchro-transmitter; Stepper Motor, Tachogenerators; Rotating Amplifiers and Magnetic Amplifiers.

Text Books:

1. Ogata, "Modern Control Engineering" EEE, 4th Edition.
2. B. C. Kuo, "Automatic Control Systems" PHI – 7th Edition.

References:

1. D. R. Choudhary, " Modern Control Engineering", PHI, 2005.
2. I. J. Nagrath, M. Gopal, "Control System Engineering" New Age International, 2000.
3. N. K. Jain, "Automatic Control System Engineering" Dhanpat Rai, 2nd Edition.
4. Less Fenical, "Control Systems", Cenage Learning, 2008

Paper Code: IT-408 **L:3 T/P:1 C:4**
Paper ID: 15408 **Paper: Advanced Database Management Systems**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

Unit-I

Relational Databases

Integrity Constraints revisited, Extended ER diagram, Relational Algebra & Calculus, Functional, Muiltivalued and Join Dependency, Normal Forms, Rules about functional dependencies.

Unit-II

Query Processing and Optimization

Valuation of Relational Operations, Transformation of Relational Expressions, Indexing and Query Optimization, Limitations of Relational Data Model, Null Values and Partial Information.

Objected Oriented and Object Relational Databases

Modeling Complex Data Semantics, Specialization, Generalization, Aggregation and Association, Objects, Object Identity, Equality and Object Reference, Architecture of Object Oriented and Object Relational Databases

Unit-III

Parallel and Distributed Databases

Distributed Data Storage – Fragmentation & Replication, Location and Fragment Transparency Distributed Query Processing and Optimization, Distributed Transaction Modeling and concurrency Control, Distributed Deadlock, Commit Protocols, Design of Parallel Databases, Parallel Query Evaluation.

Advanced Transaction Processing

Nested and Multilevel Transactions, Compensating Transactions and Saga, Long Duration Transactions, Weak Levels of Consistency, Transaction Work Flows, Transaction Processing Monitors.

Unit -IV

Data Mining

Knowledge Representation Using Rules, Association and Classification Rules, Sequential Patterns, Algorithms for Rule Discovery

Data Warehousing

Data Warehousing Architecture, Multidimensional Data Model, Update Propagation

Case Study: Oracle Xi

Text Books:

1. Elmarsi, Navathe, Somayajulu, Gupta, "Fundamentals of Database Systems", 4th Edition, Pearson Education, 2007
2. Garcia, Ullman, Widom, "Database Systems, The complete book", Pearson Education, 2007
3. R. Ramakrishnan, "Database Management Systems", McGraw Hill International Editions, 1998

References:

1. Date, Kannan, Swaminathan, "An Introduction to Database Systems", 8th Edition Pearson Education, 2007
2. Singh S.K., "Database System Concepts, design and application", Pearson Education, 2006.
3. Silberscatz, Korth, Sudarshan, "Database System Concepts", Mcgraw Hill, 6th Edition, 2006
4. W. Kim, "Modern Database Systems", 1995, ACM Press, Addision – Wesley,
5. D. Maier, "The Theory of Relational Databases", 1993, Computer Science Press, Rokville, Maryland
6. Ullman, J. D., "Principals of database systems", Galgotia publications, 1999
7. Oracle Xi Reference Manual
8. Dietrich, and Urban, "An Advanced Course in Database Systems", Pearson, 2008.

Paper Code: IT-410 **L:3 T/P:1 C:4**
Paper ID: 15410 **Paper: Soft Computing**

INSTRUCTIONS TO PAPER SETTERS:	Maximum Marks : 60
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 20 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 10 marks

Unit-I

Neural Networks:

History, overview of biological Neuro-system, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, unsupervised and reinforcement Learning, ANN training Algorithms-perceptions, Training rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks.

Unit-II

Fuzzy Logic:

Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation. Operations on Fuzzy Sets:
Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations.

Unit-III

Fuzzy Arithmetic:

Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations. Fuzzy Logic:
Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers,

Uncertainty based Information:

Information & Uncertainty, Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets.

Unit-IV

Introduction of Neuro-Fuzzy Systems:

Architecture of Neuro Fuzzy Networks.

Application of Fuzzy Logic:

Medicine, Economics etc.

Genetic Algorithm:

An Overview, GA in problem solving, Implementation of GA

Text Books:

1. "Introduction to the Theory of Neural Computation", Hertz J. Krogh, R.G. Palmer, Addison-Wesley, California, 1991.
2. "Fuzzy Sets & Fuzzy Logic", G.J. Klir & B. Yuan, PHI, 1995.
3. "An Introduction to Genetic Algorithm", Melanie Mitchell, PHI, 1998.
4. "Soft computing and Intelligent System Design", F. O. Karray and C. de Silva, Pearson, 2009.

Reference:

1. "Neural Networks-A Comprehensive Foundations", Prentice-Hall International, New Jersey, 1999.
2. "Neural Networks: Algorithms, Applications and Programming Techniques", Freeman J.A. & D.M. Skapura, Addison Wesley, Reading, Mass, (1992).

Paper Code: IT-412 **L:3 T/P:1 C:4**
Paper ID: 15412 **Paper: Natural Language Processing**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

UNIT-1
Introduction to NLP
Achievement and brief history, open problems, major goal, characterstic of Language, Language structure, Language analyzer

UNIT 2
Study of grammer and semantics
Morphology, word formation, theory of semeatics, componential theory of meaning, truth conditional theory of meaning, pragmatics and discourse

UNIT 3
Machine translation
Introduction, problems of machine translation. Approaches, language Accesor, Structure of Anusaraka system.

UNIT 4
Lexical; functional grammer (LFG) and Indian languages
Overview of LGF, LFG formalism, well formedness conditions, computational aspects, CFG and Indian languages, functional specification., tree adjoining grammer.

BOOKS-

1. Natural language processing by akshar Bhartati, Sangal and Chaitanya, Eastern Economy Edition
2. An introduction to Linguistics, language rammer and sematics by P.Syal and D.V.Jindal, Eastern Economy Edition

Paper Code: IT-414 **L:3 T/P:1 C:4**
Paper ID: 1514 **Paper: Windows .Net Framework & C# programming**

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 60**
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 20 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 10 marks

Unit -1 : Introduction to Three-Tier Architecture, overview of .NET Framework , Common Language Runtime (CLR) , The .NET Framework Class Library , familiarization with visual studio .NET IDE , Design Window, Code Window, Server , Explorer, Toolbox, Docking Windows, Properties Explorer, Solution Explorer, Object Browser, Dynamic Help, Task List Explorer, Features of VS.NET, XML Editor, Creating a Project, Add Reference, Build the Project, Debugging a Project

Unit II : Introducing C# Programming , introduction, basic language constructs, types (reference and value, relations between types) , delegates, generics, collections, strings , exceptions, threads , Networking

Unit III : Windows Forms, Adding Controls, Adding an Event Handler, Adding Controls at Runtime
Attaching an Event Handler at Runtime, Writing a Simple Text Editor, Creating a Menu Adding a New Form, Creating a Multiple Document Interface, Creating a Dialog Form Using Form Inheritance, Adding a Tab-Control, Anchoring Controls, Changing the Startup Form, Connecting the dialog, Using ListView and TreeView controls, Building an ImageList and add them to the ListView, Using details inside the ListView, Attaching a Context Menu, Adding a TreeView, Implementing Drag and Drop, Creating Controls at run time, Creating a User Control, Adding a Property, Adding Functionality, Writing a Custom Control, Testing the Control.

Unit IV: ADO.NET Architecture, Understanding the ConnectionObject, Building the Connection String, Understanding the CommandObject, Understanding DataReaders,Understanding DataSets and DataAdapters, DataTable, DataColumn, DataRow, Differences between DataReader Model and DataSet Model, Understanding the DataViewObject, Working with System.Data.OleDb, Using DataReaders, Using DataSets, Working with SQL.NET, Using Stored Procedures, Working with Odbc.NET, Using DSN Connection , Introducing the ASP.NET Architecture, ASP.NET Server Controls, Working with User, Controls, Custom Controls, Understanding the Web.config File, Using the Global.asax Page

Text book and References :

1. "Programming C#, 3rd Edition " Jesse Liberty , O'really
2. C# for Programmers, Deitel and Deitel, Pearson
3 . "Understanding .NET", Chappell, David, , Addison Wesley, 2006

Paper Code: IT-452 **L:0 T/P:0 C:8**
Paper ID: 15452 **Paper: Major Project (Report)**

Paper Code: IT-454 **L:0 T/P:0 C:2**
Paper ID: 15454 **Paper: Viva-voce (on Major Project)**

Paper Code: IT-456 **L:0 T/P:0 C:1**
Paper ID: 15456 **Paper: Seminar and Progress report**

This paper will be based on project work (IT-452). Seminar will be held in the school for the purpose of evaluation of the progress of the project work.

Paper Code: IT-458 **L:0 T/P:0 C:1**
Paper ID: 15458 **Paper: Lab assignment**

Lab will be based on elective paper(s).