B.TECH DEGREE COURSE IN COMPUTER SCIENCE & ENGINEERING (2012 Admissions)

SCHEME OF EXAMINATIONS

SEMESTER I&II (Common to all branches)

Code No.	Subject	L Hrs/ wk	T Hrs/ wk	P Hrs/ wk	C	Int	Univ	Total
1101	Engineering Mathematics –I	2	1		4	50	100	150
1102	Engineering Physics	3			4	50	100	150
1103	Engineering Chemistry	3			4	50	100	150
1104	Engineering Mechanics	3	1		5	50	100	150
1105	Engineering Graphics	1	-	3	5	50	100	150
1106	Basic Civil and Mechanical Engineering	2			4	50	100	150
1107	Basic Electrical and Electronics Engineering	2			4	50	100	150
1108	Computer Programming	1			4	50	100	150
1109	Environmental Studies and Technical Communication	2*			3	50	100	150
11 L1	Electrical and Mechanical Workshop	-	-	3	4	100	-	100
11 L2	Computer Programming Laboratory	-	-	2	2	100	-	100
11 L3	Language Laboratory	-	-	1	1	100	-	100
	TOTAL	**19**	**2**	**9**	**44**			

** 1 hour / week each for Environmental Studies and Technical Communication.*

SEMESTER III

Code No.	Subject	L Hrs/ Wk	T Hrs/ Wk	P Hrs/ Wk	C	Int.	Univ	Total
CE/CS/EB/EC/EE/ EI/FT/IT/ ME/SE1301	Engineering Mathematics-II	3	1	0	3	50	100	150
CS 1302	Logic Design	3	1	0	3	50	100	150
CS/IT 1303	Discrete Computational Structures	3	1	0	3	50	100	150
CS/IT 1304	Object Oriented Programming	3	1	0	3	50	100	150
CS 1305	Principles of Programming Languages	3	1	0	3	50	100	150
CS /EB/EE 1306	Electronic Devices and Circuits	3	1	0	3	50	100	150
CS 13L1	Electronic Circuits Laboratory	0	0	3	2	100	-	100
CS/IT 13L2	Object Oriented Programming Laboratory	0	0	3	2	100	-	100
	TOTAL	**18**	**6**	**6**	**22**			

SEMESTER IV

Code No.	Subject	L Hrs/ Wk	T Hrs/ Wk	P Hrs/ Wk	C	Int.	Univ	Total
CE/CS /EB/EC/EE/EI/FT/ IT/ME/SE 1401	Engineering Mathematics-III	3	1	0	3	50	100	150
CS/EB 1402	Microprocessors	3	1	0	3	50	100	150
CS 1403	Computer Architecture and Organization	3	1	0	3	50	100	150
CS 1404	Automata Languages and Computations	3	1	0	3	50	100	150
CS/IT 1405	Data structures and Algorithms	3	1	0	3	50	100	150
CS 1406	Data Communications	3	1	0	3	50	100	150
CS/EB 14L1	Digital Electronics Laboratory	0	0	3	2	100	-	100
CS/IT 14L2	Data structures Laboratory	0	0	3	2	100	-	100
	TOTAL	**18**	**6**	**6**	**22**			

SEMESTER V

Code No.	Subject	L Hrs/ Wk	T Hrs/ Wk	P Hrs/ Wk	C	Int.	Univ	Total
CE/CS/EB/EC/EE/EI/ FT/IT/ME/SE 1501	Engineering Mathematics-IV	3	1	0	3	50	100	150
CS 1502	System Programming	3	1	0	3	50	100	150
CS/IT 1503	Software Engineering	3	1	0	3	50	100	150
CS 1504	Computer Graphics	3	1	0	3	50	100	150
CS 1505	Database Management Systems	3	1	0	3	50	100	150
CS/EB 1506	Microprocessor Based System Design	3	1	0	3	50	100	150
CS 15L1	Microprocessor Laboratory	0	0	3	2	100	-	100
CS 15L2	Computer Graphics Laboratory	0	0	3	2	100	-	100
	TOTAL	**18**	**6**	**6**	**22**			

SEMESTER VI

Code No.	Subject	L Hrs/ Wk	T Hrs/ Wk	P Hrs/ Wk	C	Int.	Univ	Total
CS 1601	Digital Signal Processing	3	1	0	3	50	100	150
CS/IT 1602	Compiler Construction	3	1	0	3	50	100	150
CS 1603	Operating System	3	1	0	3	50	100	150
CS 1604	Computer Networks	3	1	0	3	50	100	150
CS/EB 1605	Modern Control Systems	3	1	0	3	50	100	150
CS 1606	Elective I	3	1	0	3	50	100	150
CS 16L1	System Programming and Hardware Laboratory	0	0	3	2	100	-	100
CS 16L2	Mini Project	0	0	3	2	100	-	100
	TOTAL	**18**	**6**	**6**	**22**			

Elective I:

CS 1606 E1: Software Testing

CS 1606 E2: System Modeling & Simulation

CS 1606 E3: Security in Computing

CS/ IT 1606 E4: Embedded Systems

SEMESTER VII

Code No.	Subject	L Hrs/ Wk	T Hrs/ Wk	P Hrs/ Wk	C	Int.	Univ	Total
CS/EB/EC/EE/EI/IT 1701	Industrial Organization and Management	3	1	0	3	50	100	150
CS 1702	Artificial Intelligence	3	1	0	3	50	100	150
CS 1703	Advanced Computer Networks	3	1	0	3	50	100	150
CS 1704	Analysis and Design of Algorithms	3	1	0	3	50	100	150
CS 1705	Elective II	3	1	0	3	50	100	150
CS 17L1	Language Processors Laboratory	0	0	3	2	100	-	100
CS 17L2	Networks and Operating Systems Laboratory	0	0	3	2	100	-	100
CS 17L3	Project Design	0	0	2	1	50	-	50
CS 17L4	Seminar	0	0	2	2	50	-	50
	TOTAL	**15**	**5**	**10**	**22**			

Elective II:

CS 1705 E1: Software Project Management

CS 1705 E2: Information Retrieval

CS 1705 E3: Grid Computing

CS/IT 1705 E4: Neural Networks

SEMESTER VIII

Code No.	Subject	L Hrs/ Wk	T Hrs/ Wk	P Hrs/ Wk	C	Int.	Univ	Total
CS 1801	Advanced Architecture and parallel Processing	3	1	0	3	50	100	150
CS 1802	Object Oriented Modeling and Design	3	1	0	3	50	100	150
CS/IT 1803	Distributed Computing	3	1	0	3	50	100	150
CS 1804	Elective III	3	1	0	3	50	100	150
CS 18L1	Project	0	0	14	8	300	-	300
CS 18L2	Viva-Voce	0	0	0	2	-	100	100
	TOTAL	**12**	**4**	**14**	**22**			

Elective III:

CS 1804 E1: Operations Research

CS 1804 E2: Data Mining

CS 1804 E3: Mobile Computing

CS 1804 E4: Agent Based Intelligent Systems

1101 ENGINEERING MATHEMATICS I

Module I
Ordinary differential equations:

First order differential equations - exact differential equations, Bernoulli's equations--Methods of solution and Simple applications.

Linear differential equations of higher orders with constant co-efficients-Methods of solution of these equations. Cauchy's linear differential equations. Simultaneous linear differential equations- Simple applications of linear differential equations in engineering problems –Electrical Circuits, Mechanical Systems.

Module II
Infinite series : Integral test, comparison test, ratio test, Cauchy's root test, Raabe's test, seies of positive and negative terms, concept of absolute convergence, alternating series, Leibniz test(No proofs for any of the above tests)

Power series : Taylor and Maclaurin series of functions, Leibniz formula for the nth derivative of the product of two functions (No proof),use of Leibniz formula for the determination of co-efficients of the power series.

Module III
Partial differentiation: Partial differentiation-Concept of partial derivative - Chain rule- Total derivative-Euler's theorem for homogeneous functions, Differentials and their applications in errors and approximations, Jacobians - Maxima minima of functions of two variables(Proof of the result not required)-Simple applications.

Co-ordinate systems: Rectangular co-ordinates-Polar co-ordinates-In plane and in Space-Cylindrical polar co-ordinates-Spherical polar co-ordinates.

Module IV
Integral calculus:
Application of definite integrals: Area, Volume, Arc length, Surface area.
Multiple integrals : Evaluation of double integrals-Change of order of integration. Evaluation of triple integrals-Change of Variables in integrals.
Applications of multiple integrals. Plane Area, Surface area &Volumes of solids

References:

1. S.S.Sastry, Engineering Mathematics -Vol1, PHI publishers
2. Erwin Kreyzig, Advanced Engineering Mathematics, Wiley Eastern
3. T.Veerarajan, Engineering Mathematics, TMGH Publishers
4. B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers

Type of Questions for University Exam.
Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)

1102 ENGINEERING PHYSICS

Module 1

Laser-introduction--spontaneous and stimulated emission-principle of laser- properties of laser-Einstein coefficients and the analysis of lasing conditions- Basic components of a laser-Different types of lasers-construction,working and applications of Ruby laser-Neodymium YAG laser- He-Ne laser- semiconductor laser-Applications of laser in medicine, industry, science and communication.

Holography-basic principle-Comparison with ordinary photography-Recording and reconstruction of holograms-applications.

Fibre optics - Basic structure of an optical fibre - step-index fibre and graded index fibre- propagation of light in an optical fibre-acceptance angle and acceptance cone- Numerical aperture of a step-index fibre-Numerical aperture of a graded index fibre-modes of propagation-step index monomode fibre-Multimode stepindex fibre- Graded multimode fibre-Attenuation in optic fibres-fibre losses-material loss,scattering loss,absorption loss,leaky modes- dispersion in optical fibres- Applications.

Module II

Crystallography – Space lattice- Basis- Unit cell- Unit cell parameters- Crystal systems- Bravais lattices-Three cubic lattices-sc, bcc, and fcc- Number of atoms per unit cell- Co-ordination number- Atomic radius-Packing factor- Relation between density and crystal lattice constants- Lattice planes and Miller indices-Separation between lattice planes in sc- Bragg's law- Bragg's x-ray spectrometer- Crystal structure analysis.

Liquid crystals- Liquid crystals, display systems-merits and demerits- Metallic glasses- Types of metallic glasses (Metal-metalloid glasses, Metal-metal glasses) – Properties of metallic glasses (Structural, electrical,magnetic and chemical properties).

Shape memory alloys- Shape memory effect, pseudo elasticity

Module III

Introduction to nanoscale science and technology- nanostructures-nanoring, nanorod, nanoparticle, nanoshells- Properties of nanoparticles- optical, electrical, magnetic, mechanical properties and quantum confinement- Classification of nanomaterials- C60, metallic nanocomposites and polymer nanocomposites-Applications of nanotechnology.

Superconductivity-Introduction--transition temperature-Meissner effect-properties of super conductors.Types of superconductors-type 1 and type 2- AC Josephsons effect- DC Jospehsons effect- Flux quantisation-Squid-High temperature superconductors-Applications of super conductivity.

Special Theory of Relativity - Michelson-Morley experiment. Einstein's postulates. Lorentz transformation equations (no derivation). Simultaneity. Length contraction. Time dilation. Velocity addition. Relativistic mass. Mass energy relation. Mass less particle.

Module IV

Quantum mechanics-Introduction-origin of quantum theory-black body radiation and photo electric effect (brief ideas only)-matter waves- wave packet-uncertainty principle-(two forms)Time dependent Shrodinger equation for a free particle-Particle in force field and time dependent Schrodinger equation-Time independent schrodinger equation-Physical intrepretation of wave function-application -Particle in a Box (one dimensional) –Energy eigen values and wave functions **Ultrasonics**-piezo electric effect-Magnetostriction effect-production of ultrasonics-properties of ultrasonics- ultrasonic diffractometer and determination of velocity of ultrasonics in a liquid-Application of ultrasonics in non destructive testing - Accoustics of building-reverberation- Absorption Coefficient- Sabines formula for reverberation time(Derivation)-Accoustic intensity- loudness-decibel-phon-conditions for good acoustics(Qualitative study).

References:

1. S. Mani Naidu, A Text book of Engineering Physics, Pearson, 2010
2. M.C. Santosh Kumar, Engineering Physics, Nalpat Publishers.
3. B. Premlet, Advanced Engineering Physics, Phasor Books, Kollam.
4. A.S. Vasudeva, Modern Engineering Physics, S. Chand & Co.
5. Prabir K. Vasu and Hrishikesh Dhasmana, Engineering Physics, Ane books Pvt. Ltd., 2010.
6. S.O. Pillai & Sivakami, Applied Physics, New Age International (P) Ltd., Second Edition 2008.
7. G.S. Raghuvanshi, Engineering Physics, Prentice Hall of India.

Type of Questions for University Exam.

Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)

1103 ENGINEERING CHEMISTRY

Module I

Solid state chemistry: Fundamentals, Bonding in solids, Born-Haber cycle, Point defects, Methods to improve reactivity of solids, Free electron theory, Band theory, Fermi level in semiconductors, Molecular field theory of magnetic materials.

Spectroscopy: Molecular energy levels-Types of molecular spectra- Electronic spectra (Classification of electronic transitions- Beer Lamberts law, Vibrational spectra (mechanism of interaction and application), Rotational spectra (Determination of bond length and application). NMR spectra (Basic principle, chemical shift, spin-spin splitting)

Solid surface characterisation: Electron spectroscopy for chemical analysis, Chemical shift, BET isotherm, Thermodynamics of adsorption.

Module II

Electrochemistry: Fundamentals, Electrode potential, Nernst's equation, Types of electrodes, Salt bridge, E.M.F measurement. Concentration cells, Calculation of E.M.F of a concentration cell.

Acids and bases, Arrhenius concept, Bronsted-Lowry concept of acids and bases, Lewis concept, Buffer solutions, pH measurement, Polarisation, Overvoltage.

Power generation: Secondary cells, Fuel cells, Photovoltaic effect, Solar cells.

Corrosion and its control: Theories of corrosion - Galvanic series- Types of corrosion - Factors affecting corrosion and different methods of corrosion control.

Chemical Kinetics: reaction rate, rate constant, rate law, reaction order, first order, second order, pseudo-first order reactions, integrated rate laws, half-life of a reaction and its relation to rate constant. Molecularity, simple unimolecular and bimolecular reactions. Arrhenius equation.

Module III

Chemical Thermodynamics: Fundamentals, Molecular interpretation of internal energy, enthalpy and entropy, Heat of reaction, Kirchhof's equation, Trouton's rule, Entropy changes accompanying different processes, Nernst heat theorem, Third-law.

Free energy: Dependence on pressure and temperature, Gibbs-Helmholtz equation, Free energy changes and equilibrium constant, chemical potential, Fugacity, Thermodynamics of biochemical reactions.

Phase Rule: Terms involved in phase rule and examples, Application of phase rule to one component water system, Application of phase rule to two-component systems.

Module IV

Engineering materials:

Polymers- Classifications- Mechanism of polymerisation (Addition, free radical, cationic, anionic and coordination polymerisation)- Thermoplastics and thermosetting plastics-Compounding of plastics-Moulding techniques of plastics (Compression, Injection, Transfer and Extrusion moulding)-Preparation, properties and uses of PVC, PVA, Nylon, PET - Silicon polymers- Biodegradable plastics. Elastomers- structure of natural rubber- vulcanisation- synthetic rubbers (Buna-S, Butyl rubber and Neoprene).

Lubricants- Introduction-Mechanism of lubrication- solid and liquid lubricant- Properties of lubricants- Viscosity index- flash and fire point- cloud and pour point- aniline value.

Refractories: Classification – Properties of refractories.

Cement- Manufacture of Portland cement- Theory of setting and hardening of cement.

References:

1. Peter Atkins, Julio de Paula, Elements of Physical Chemistry, Oxford University Press, 2005.
2. John E. McMurry and Robert C. Fay, Chemistry, 5th Edition, Pearson, 2008.
3. O. G Palanna, Engineering Chemistry, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2009.
4. R.N. Goyal, Harmendra Goel, Textbook of Engineering Chemistry, 2nd Edition, Ane Books Pvt. Ltd., 2011.
5. R Gopalan, D Venkappayya, Sulochana Nagarajan, Textbook of Engineering Chemistry, 2nd Edition, Vikas Publishing House Pvt. Ltd., New Delhi, 2005.
6. Shashi Chawla, A Text Book of Engineering Chemistry, Dhanpat Rai & Co, New Delhi, 2003.
7. Kochubaby Manjooran, Modern Engineering Chemistry, Kannantheri Publication, Kochi.

Type of Questions for University Exam.

Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)

1104 ENGINEERING MECHANICS

A) STATICS

Module I

Concurrent forces in a plane: Principles of statics. Composition and resolution of forces. Equilibrium of concurrent forces in a plane. Method of projection. Method of moments. Friction.

Parallel forces in a plane: Two parallel forces. General case of parallel forces in a plane. Centre of parallel forces and centre of gravity, Pappus theorems, centroids of composite plane figures and curves. Distributed forces in a plane.

Module II

Properties of areas: . Moment of inertia of a plane figure with respect to an axis in its plane. Polar moment of inertia. Product of inertia. Principal axes. Mass moment of inertia of material bodies.

General case of forces in a plane: Composition of forces in a plane. Equilibrium of forces in a plane. Plane trusses - Method of joints. Method of sections. Plane frames : Method of members. **Principle of virtual work:** Equilibrium of ideal systems, stable and unstable equilibrium.

B) DYNAMICS

Module III

Rectilinear translation: Kinematics of rectilinear motion. Differential equation of rectilinear motion. Motion of a particle acted upon by a constant force, by a force as a function of time and by a force proportional to displacement. Simple harmonic motion. D'Alembert's principle. Momentum and impulse. Work and energy, ideal systems, conservation of energy. Impact.

Module IV

Curvilinear translation: Kinematics of curvilinear translation. Differential equations of motion. Motion of a projectile. D'Alembert's principle in curvilinear motion. Moment of momentum. Work and energy in curvilinear motion.

Rotation of a rigid body: Kinematics of rotation. Equation of motion of a rigid body rotating about a fixed axis. Rotation under the action of a constant moment. Compound pendulum. General case of moment proportional to the angle of rotation. D'Alemberts principle of rotation. Resultant inertia force in rotation. Principle of angular momentum in rotation. Energy equation for rotating bodies.

References:

1. Timoshenko and Young, Engineering Mechanics, McGraw Hill Book Company.
2. Beer F. P. and Johnston E. R, Mechanics for Engineers (Vol. 1- Statics and Vol.2 -Dynamics), Tata McGraw Hill.
3. Merriam H. L. & Kraige L. G, Engineering Mechanics (Vol. 1- Statics and Vol.2 -Dynamics), John Wiley and Sons.
4. Biju N, Engineering mechanics, Educational Publications.

Type of Questions for University Exam.

Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)

1105 ENGINEERING GRAPHICS

Module I

Introduction to engineering graphics. Drawing instruments and their use. familiarisation with current Indian Standard Code of Practice for general engineering drawing.

Scales- plain scale ,vernier scale, diagonal scale.

Conic sections- Construction of ellipse, parabola, hyperbola - construction of cycloid, involute, archimedian spiral and logarithmic spiral- drawing tangents and normals to these curves.

Module II

Introduction to orthographic projections- plane of projection- principles of first angle and third angle projections, projection of points in different quadrants.

Orthographic projection of straight lines parallel to one plane and inclined to the other plane- straight lines inclined to both the planes- true length and inclination of lines with reference planes- traces of lines.

Projection of plane laminae of geometrical shapes in oblique positions.

Module III

Projection of polyhedra and solids of revolution- frustum, projection of solids with axis parallel to one plane and parallel or perpendicular to other plane- projection of solids with axis inclined to both the planes- projection of solids on auxiliary planes.

Section of solids by planes inclined to horizontal or vertical planes- true shape of sections.

Module IV

Development of surface of cubes, prisms, cylinders, pyramids and cones

Intersection of surfaces- methods of determining lines of intersection - intersection of prism in prism and cylinder in cylinder.

Module V

Introduction to isometric projection- isometric scales, isometric views- isometric projections of prisms, pyramids, cylinders, cones and spheres.

Introduction to perspective projections : visual ray method and vanishing point method- perspective of circles- perspective views of prisms and pyramids.

References:

1. K.C. John. Engineering Graphics, PHI Learning
2. P.I. Varghese and K.C. John, Engineering Graphics, JET Publishers
3. N.D.Bhat , Elementary Engineering Drawing, Charotar publishing house
4. P.S.Gill , Geometric Drawing, B.D Kataria &Sons, Ludhiana
5. P I Varghese , Engineering Graphics, VIP Publishers.

University Examination Question Paper pattern

Two questions of 20 marks each from all the five modules. Answer one question from each module. (5x20 = 100 marks)

1106 BASIC CIVIL AND MECHANICAL ENGINEERING
PART- A: BASIC CIVIL ENGINEERING

Module I

Engineering Materials: Cement - varieties and grade of cement and its uses. Cement mortar- Steel- types of steel for reinforcement bars, steel structural sections. Brick- varieties and strength, tests on bricks.

Aggregates- types & requirements. Concrete- grades of concrete as per IS code, water cement ratio, workability, mixing, batching, placing, compaction and curing.

Construction : Foundation- types of foundations- isolated footing, combined footing, raft, pile & well foundations- Foundation for Machinery

Module II

Super structure: Brick masonry, English bond and Flemish bond, Stone masonry-Ashlar masonry- Rubble masonry. Roofing- Steel trusses, roofing for industrial buildings

Surveying: Principles, instruments, ranging and chaining of survey lines, errors in chaining, field work, field book, selection of survey stations, reconnaissance.

Leveling: Leveling instruments, different types, temporary adjustments, mean sea level, reduced level of point, booking of field notes, reduction of levels by height of collimation method.

References:

1. S.C. Rangawala, Engineering Materials, Charotar Publishing House, Anand.
2. Roy M. Thomas, Fundamentals of Civil Engineering, Educational Publishers,Ernakulam
3 Surendra Singh, Building Materials, Vikas Publishing Company, New delhi.
4 S.C. Rangawala, Building Construction, Charotar Publishing House, Anand.
5. P. Kanetkar, Surveying and Levelling, Volumes 1 and 2, United Book Corporation, Poona.

PART A - Type of Questions for University Exam. (Maximum Marks: 50) (To be answered in separate answer book)

Q 1 Four short answer questions of 5 marks each with two questions from each module. (4x5 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each module with option to answer either A or B. (2 x 15 = 30 marks)

PART – B: BASIC MECHANICAL EGINEERING

Module I

Thermodynamics: Thermodynamics systems – open, closed and isolated systems, equilibrium state of a system, property and state, process, cycle, Zeroth law of thermodynamics- concept of temperature, temperature scales. First law – internal energy, enthalpy, work and heat, Different processes, isobaric, isochoric, isothermal and adiabatic processes Second law – Kelvin-plank and Claussius statements, Carnot Cycle.

Internal Combustion Engines: Air standard cycles – Otto and Diesel cycles, working of two stroke and four stroke Petrol and Diesel engines, Carburatted and MPFI engines, fuel pump, fuel injector, ignition system, cooling system, lubricating system.

Module II

Refrigeration and Air conditioning: Vapour compression and vapour absorption refrigeration systems, summer, winter and comfort air conditioning.

Manufacturing processes – Casting (sand and die casting processes), Forging (open &closed die forging), Rolling, Extrusion, Welding (resistance, arc and gas), brazing and soldering

Elementary ideas of **simple reaction and impulse turbines**, compounding of turbines.

Transmission of power: Belt drives (open and closed), Chain drives.

References:

1. P.K. Nag, Engineering Thermodynamics, Tata McGraw Hill
2. J.P. Holman, Thermodynamics, Mc Graw Hill
3. Rogowsky, Elements of Internal combustion Engines, Tata McGraw Hill
4. Gill, Smith & Ziurys, Fundamentals of Internal Combustion Engines, Oxford & IBH
5. Stoecker, Refrigeration and Air Conditioning, Tata McGraw Hill
6. Raghavan : Material Science and Engineering, Prentice Hall of India

PART B - Type of Questions for University Exam. (Maximum Marks: 50) (To be answered in separate answer book)

Q 1 Four short answer questions of 5 marks each with two questions from each modules. (4x5 = 20 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each module with option to answer either A or B. (2 x 15 = 30 marks)

1107 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

PART- A: ELECTRICAL ENGINEERING

Module I

Resistance : Circular wires – Wire Tables – Temperature Effects – Types of Resistors – Colour Coding and Standard Resistor Values – Conductance – Ohmmeters – Metric Units –The Memristor. **Ohm's Law, Power and Energy** : Ohm's Law – Plotting Ohm's Law – Power – Energy – Efficiency – Circuits Breakers, GFCI's and Fuses – Applications .

Series dc Circuits: Series Resistors – Series Circuits – Power Distribution and Series circuit – Voltage Sources in a Series – Kirchoff's Voltage Law – Voltage Division in a Series Circuit – Interchanging Series Elements – Notation – Voltage Regulation and the Internal Resistance of Voltage Sources. **Parallel dc Circuits:** Parallel Resistors – Parallel Circuits – Power Distribution in a Parallel Circuit – Kirchhoff's Current Law – Current Divider Rule – Voltage Sources in Parallel – Open and Short Circuits.

Capacitors: The Electric Field – Capacitance – Capacitors, **Inductors:** Magnetic Field – Inductance.

Module II

AC Fundamentals: Sinusoidal Alternating Waveforms - Sinusoidal ac Voltage Characteristics and Definitions – Frequency Spectrum – The Sinusoidal Waveform – General format for the sinusoidal Voltage of current – Phase Relations – Average Value – Effective (rms) Values – ac Meters and Instruments. Elementary Concepts of Energy Meter Watt Meter, Volt Meter and Ammeter.

The Basic Elements and Phasors: Response of Basic R,L and C Elements to a Sinusoidal Voltage or Current – Frequency Response of the Basic Elements – Average Power and Power Factor – Complex Numbers – Rectangular Form – Polar Form – Conversion between Forms.

Series and Parallel ac Circuits: Impedance and the Phasor Diagram- Series Configuration – Voltage Divider Rule – Frequency Response for Series ac Circuits –Admittance and Susceptance – Parallel ac Networks – Current Divider Rule – Frequency response of Parallel Elements.

Introduction to 3 phase Systems: StarΔ Connection

Elementary Concepts of Generation, Transmission, and Distribution: Various Levels of Power Transmission – Conventional Sources of Electrical Energy, Hydro, Thermal, Nuclear and Diesel Power Station - Introduction to Primary and Secondary distribution - Basic Concepts of Transformers - Principle of Operation – Applications to Power Systems.

PART- B: ELECTRONICS ENGINEERING

Module III

The Diode - Biasing the Diode, Voltage - Current Characteristic of a Diode, Diode Models, **Diode Applications** - Half Wave and Full Wave Rectifiers, Power supply Filters and Regulators, **Special Purpose Diodes** - Zener Diodes- Applications, Varactor Diodes, Optical Diodes-Other Types of Diodes. **Bipolar Junction Transistors (BJTs)** - Transistor Structure - Basic Transistor Operation, Transistor characteristics and parameters, Transistor as an Amplifier, Transistor as a Switch.

Module IV

Sensors-Temperature, light, force and sound sensors; **Actuators** – Heat, Light, force and sound actuators. **Electronic measurements** - measurements of voltages and currents, voltmeter, ammeter, multimeter, CRO (Block level treatment only)

Introduction to Electronic Communication systems: Modulation and Demodulation, Analog communication system, Electromagnetic frequency spectrum, Bandwidth and information capacity, Principles of Amplitude and angle modulation, Bandwidth requirements of angle modulated waves.

Optical communication: Fundamental concepts, Block diagram of an optical fibre communications system.

Cellular Telephone: Fundamental concepts, Frequency reuse, Block diagram of a simplified cellular telephone system, Roaming and handoffs

Satellite communication: Block diagram of Satellite system link models – Uplink, Transponder Downlink.

Reference:

1. Boylestad, *Introductory Circuit analysis*, Pearson Education, 12/e, 2012.
2. Thomas L. Floyd, Electronic Devices, Pearson Education Inc. 7th edition.
3. Neil Storey, Electronics A systems approach, Pearson Education Inc. 2011
4. Wayne Tomasi, *Electronic Communication Systems: Fundamentals through Advanced*, Pearson Education Inc. 5th edition.

Type of Questions for University Exam.

Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)

1108 COMPUTER PROGRAMMING

Module I

Basics of Computer and Information Technology:

Digital Computer System (CPU, Memory, I/O devices)- Working of a digital computer- Hardware and Software : Definition - Categories of Software, Application of Computers – Role of Information Technology – Internet Services

Problem Solving Methodology:

Program - Programming Process (Problem statement, Analysis, Design a solution, Implement/Coding the solution, Test the solution, Iteration through the phases to refine/correct the program)- Design tools (Algorithm, Flow-chart, Pseudo-code)- Develop algorithms for simple problems.

Module II

Programming Languages:

Types and generation of programming languages- Compiler – Interpreter-Linker –Loader –Execution of Program

Basics of C:

Character set-Identifier- Keywords- Constants –Data Types- Variables and declaration –Operators and Expressions – Operator precedence and associativity – Expression Evaluation (Simple Examples) - Input and output functions – Simple computational problems involving the above constructs.

Module III

Control Statements:

Selection, Conditional operator, Iteration (for, while, do-while), Branching (switch, break, continue, goto), Nesting of control statements- Problems using control statements.

Arrays and Strings:

1D and 2D arrays –Searching (Linear and Binary) - Sorting (Bubble, Selection) – Matrix manipulation programs – Strings and basic operations on strings – Strings functions - Programs on string manipulation

Functions:

Definition – Calling – Declaration – Parameter Passing (by value and by reference) – Recursion – Library functions –Programs based on functions

Module IV

User defined data types:

Structure – Union - Enumerated data type - Programs involving structure and union.

Pointers:

Declaration, Initialization – Pointers and arrays – Pointers and structures – Pointers and functions – Command line arguments – Dynamic memory allocation – Operations on pointers – Programs involving the above concepts

Files:

File concept – File pointer – File handling operations (open, close, read, write etc) on sequential and random access files. Programs on file manipulations using fgetc(), fgets), fseek.

References:

1. Pradip Dey and Manas Ghosh, Computer Fundamentals and Programming in C, Oxford.
2. Samarjit Ghosh, All of C, PHI Learning
3. Byron Gottfried , Programming with C , 2nd edition, TMH publication.
4. B.W. Kernighan and D.M. Ritchie, The C Programming Language, Pearson Education.
5. R G Dromey , How to solve it by Computer, Prentice Hall
6. D.E. Knuth, The Art of Computer Programming – Volume 1,2 &3, Addison Wesley.
7. Yashwant P. Kanetkar, Let Us Use C, 8th Edition (Paperback).
8. Sukhendu Dey , Complete Knowledge in C, Narosa
9. Varghese Paul, Computer Fundamentals , EPD.

Type of Questions for University Exam.

Q 1.Eight short answer questions of 5 marks with two questions from each of the four modules. (8x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B. (4x15 = 60 marks)

1109 ENVIRONMENTAL STUDIES AND TECHNICAL COMMUNICATION

PART – A: ENVIRONMENTAL STUDIES (1 hour / week)

Module I

Natural resources - issues related to the use and over exploitation of forest resources, water resources, mineral resources, food resources, energy resources and land resources- role of an individual in conservation of natural resources - equitable use of resources for sustainable life styles.

Concept of an ecosystem - structure and function - energy flow in the ecosystem - ecological succession - food chains, food webs and ecological pyramids - structure and functions of a forest ecosystem and an aquatic eco system.

Definition of biodiversity - genetic, species and ecosystem diversity - biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Threats to biodiversity, Conservation of biodiversity.

Module II

Environmental Pollution - Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, marine pollution, thermal pollution and nuclear hazards - Causes, effects and control measures of urban and industrial solid wastes -Role of an individual in prevention of pollution - An overview of the various environmental legislations in India - Issues involved in enforcement of environmental legislation. Disaster Management: Floods, earth quake, cyclone and landslides. Role of public awareness in disaster management.

The concept of sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, water shed management - Resettlement and rehabilitation of people; its problems and concerns - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies - Population growth and problems of population explosion – Environment and human health – Human rights – Value education – Role of Information Technology in environment and human health - Environmental ethics: issues and possible solutions.

References:

1. Rajagopalan. R, Environmental Studies: From Crisis to Cure, Oxford University Press, 2005
2. Erach Bharucha, Textbook of Environmental Studies and Ethics, Universities Press (India), Hyderabad, 2005.
3. Jayashree A. Parikh, V.M. Balsaraf, P.B. Dwivedi, Environmental Studies, Ane Books Pvt. Ltd., 2010.
4. Anindita Basak, Environmental Studies, Pearson, 2009.
5. Gouri Suresh, Environmental Studies and Ethics, I.K. International Publishing House Pvt. Ltd., New Delhi, 2007.
6. S.P. Misra, Essential Environmental Studies, 3rd Edition, Ane Books Pvt. Ltd., 2011.
7. Benny Joseph, Environmental Science & Engineering, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2010.
8. Meenambal T , Uma R M and K Murali, Principles of Environmental Science and Engineering, S. Chand & Company Ltd, 2005

PART – B: TECHNICAL COMMUNICATION (1 hour / week)

This is a practice oriented, need based, and functional – communicative course. It is intended to develop the student's skill of communication in listening, speaking, reading and writing. The student is advised to cultivate the habit of reading newspapers, magazines and books in a free, extensive manner to consolidate the skill already achieved. A more inter-active process of teaching/learning is called for in order to achieve effective communication.

Questions at the class tests and semester end examination will be largely problem solving and application oriented in nature.

Module I

Communicative Grammar: Time, tense and aspect; Verbs of state and event; Use of preposition; Expressing emotions and attitudes: Hope, anticipation of pleasure, disappointment, approval, disapproval, surprise.

The sounds of English: (it is not a course in phonetics. Technical terms will not be used except when absolutely necessary.)

Length of vowels-long and short vowels

/ | /, / 3 : /, /a :/, / : /, /U : / | / / 2 /, /,/ Λ /, / O /, / U / - Consonants : / f, v, o, o, s, z, 3/ - Stress pattern - Intonation: failing and rising.

Oral Communication: starting and ending a conversation; telling and asking people to do things; expressing

opinions and ideas, decisions and intentions, offers and invitations, feelings, right and wrong, numbers and money.

Purpose and audience; dealing with customers and clients; face-to-face discussions; interviews; group discussions; meetings and attending meetings; checking understanding; raising questions; giving and receiving feedback; using body language; leading and directing discussions; concluding discussions; using graphics in oral presentations

Reading Comprehension and reference skills: skimming and scanning; factual and inferential comprehension; prediction; guessing meaning of words from context; word reference; comprehending graphics in technical writing.

Reading strategies; reading speed; reading between the lines for hidden meaning; interpreting graphics; using a dictionary; using an index; using a contents list to find information; choosing the right reference source.

Module II

Written Communication: note making and note taking; summarizing; notes and memos; developing notes into text; organization of ideas: cohesion and coherence; Preparing notes – writing business letters and E-mail messages. Organizing a meeting, preparing an agenda, chairing a meeting, drafting motions and resolutions, writing minutes.

Paragraph writing: Paragraph writing – Topic sentence, cohesion and coherence- sentence liners (so, but, however etc), ordering information in space and time; short essays: description and argument; comparison and contrast; illustration; using graphics in writing: tables and charts; diagrams and flow-charts; maps, plans and graphs. Preparation of a business report-writing a business proposal - format, length,structure.

Spelling rules and tips; writing a rough draft; editing and proof reading; writing the final draft; styling text; filling in complex forms; standard letters; Writing a curriculum vitae (both chronological & functional) along with an application for a job; Public relation – Concept and relevance – PR in a business organization-handing the media; writing a report; writing leaflets and brochures; writing references; essay writing: expository writing; description of processes and products; classification; the instructional process; arguments and presentation of arguments; narrating events chronologically.

References :

1.John Seely, Oxford Guide to Writing and Speaking, Oxford University Press.
2.C. Muralikrishna and Sunita Mishra, Communication Skills for Engineers, 2nd Edition, Pearson, 2011.
3.Meenakshi Raman and Sangeetha Sharma, Technical Communication: Principles and Practice, Oxford University Press, 2004.
4.Krishna Mohan and Meenakshi Raman, Effective English Communication,Tata Mc-GraHill,2000.
5.William Sanborn Pfeiffer, T.V.S. Padmaja, Technical Communication – A Practical Approach, Pearson, 2007.
6.R.C. Bhatia, Business Communication, 2nd Edition, Ane Books Pvt. Ltd., 2008.
7.Krishna Mohan and Meera Banerji, Developing Communication Skills, Mac Millan India Ltd, 2000.

University Examination Pattern

The question paper will have two parts. Part A and Part B will have a weightage of 50 marks each and they will have to be answered in separate answer books.

Question Paper Pattern for Part A (Environmental Studies)

Q I. – 6 short type questions of 3 marks each, with three questions from each module (6 x3 = 18)

QII. – 2 questions A and B of 16 marks from Module I with choice to answer one. Both A and B should have a minimum of two sub – sections.

QIII - 2 questions A and B of 16 marks from Module II with choice to answer one. Both A and B should have a minimum of two sub – sections.

Question Paper Pattern for Part B (Technical Communication)

Q I – 10 short answer questions of 2 marks each, with five questions from each module. The questions shall be problem solving and application oriented in nature. (10x2 = 20 marks)

QII. – 2 questions A and B of 15 marks from Module I with choice to answer one. Both A and B should have a minimum of two sub – sections. The questions shall be problem solving and application oriented in nature.

QIII - 2 questions A and B of 15 marks from Module II with choice to answer one. Both A and B should have a minimum of two sub – sections. The questions shall be problem solving and application oriented in nature.

11 L1 ELECTRICAL AND MECHANICAL WORKSHOP

ELECTRICAL WORKSHOP

1. One lamp controlled by one switch 2. Series and parallel connections of lamps.
3. Stair case wiring.
4. Hospital Wiring.
5. Godown wiring.
6. Fluroscent lamp.
7. Connection of plug socket.
8. Different kinds of joints.
9. Transformer winding.
10. Soldering practice.
11. Familiarisation of CRO.

MECHANICAL WORKSHOP

Preliminary exercises for beginners in all the following shops. Specific models may be designed by the teachers.

1) Fitting Shop.
2) Sheet Metal Shop
3) Foundry Shop
4) Welding Shop
5) Carpentry Shop

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

11 L2 COMPUTER PROGRAMMING LABORATORY

Application packages

Word

1. To create an advertisement in Word.

2. To illustrate the concept of mail merging in word.

Spread Sheet

3. To create a spread sheet to analyse the marks of the students of a class and also to create appropriate charts.

Power Point

4. To create the presentation for the department using Power Point.

C Programming Basics

Operators & Expressions

5. To write a simple menu driven calculator program using switch statement

IO Formatting

6. To write a program to print Pascal's triangle.

Decision Making

7. To write a program for electricity bill preparation.

Looping

8. To write a program to print the *sine* and *cosine* series.

Arrays

9. To write a program to perform Matrix multiplication.

10. To write a program to prepare and print the sales report.

String

11. To write a program to perform string manipulation manipulations function like *string concatenations, comparison, find the length and string copy* without using library functions.

12. To write a program to arrange names in alphabetical order.

Functions

13. To write a C program to calculate the mean, variance and standard deviation using functions.

14. To write a C program to perform sequential and binary search using functions.

Recursion

15. To write a program to print the Fibonacci series and to calculate the factorial of the given number using functions.

Structures

16. To print the mark sheet of n students using structures.

Pointers

17. To write a program using pointers to access the elements of an array and count the number of occurrences of the given number in the array.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

11 L3 LANGUAGE LABORATORY

The **Language Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

Objectives:

1. To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
2. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams.
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
4. To train them to use language effectively to face interviews, group discussions, public speaking.
5. To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.

SYLLABUS :

The following course content is prescribed for the **English Language Laboratory** sessions:

1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.
2. Introduction to Stress and Intonation.
3. Situational Dialogues / Role Play.
4. Oral Presentations- Prepared and Extempore.
5. 'Just A Minute' Sessions (JAM).
6. Describing Objects / Situations / People.
7. Information Transfer
8. Debate
9. Telephoning Skills.
10. Giving Directions.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CE/CS/EB/EC/EE/EI/FT/IT/ME/SE 1301 ENGINEERING MATHEMATICS 1I

Module I

Matrices and Vector spaces: Rank of matrix, Echelon and normal form, Solutions of linear systems of algebraic equations, Eigen values and Eigen vectors, Cayley Hamilton theorem (non proof).

Vector Spaces – Subspaces, - Linear Independence of vectors-Linear span-Dimension and Basis. Linear transformations.

Module II

Fourier series and Fourier integrals: Forier series of Periodic functions- Euler formulae for Fourier coefficients- functions having period 2π, arbitrary period-even and odd functions-half range expansions, Fourier integral, Fourier cosine and sine transformations, linearity property, transform of derivatives, convolution theorem (no proof)

Module III

Laplace transforms: Linearity property, transforms of elementary functions, Laplace transforms of derivatives and integrals, differentiation and integration of transforms, convolution theorem (no proof) use of Laplace transforms in the solution of initial value problems, unit step function, impulse function - transform of step functions, transforms of periodic functions.

Module IV

Vector calculus: Scalar and Vector point functions-Gradient and directional derivative of a scalar point function- Divergence and Curl of a vector point functions-their physical meanings.

Evaluation of line integral, surface integral and volume integrals, Gauss's divergence theorem, Stoke's theorem (No Proof of these theorem), conservative force fields, scalar potential.

References:

1. R.K.Jain, S.R.K.Iyengar, Advanced Engineering Mathematics: Narosa Publishers.
2. C.R.Wilie & L.C.Barrett, Advanced Engineering Mathematics, Mc-Graw Hill
3. Larry C Andrews, Ronald C Philips, Mathematical Techniques for Engineers & Scientists, PHI Publishers
4. M.C.Potter, J.L.Goldberg, Advanced Engineering Mathemartics, Oxford Unversity Press.
5. B.S.Grewal, Higher Engineering Mathematics: Khanna Publishers.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1302 LOGIC DESIGN

Module I

Introduction : Digital System-Binary Numbers-Base conversions-Octal and Hexa decimal numbers-compliments-Signed binary numbers- Binary codes-Binary storage and Registers-Binary Logic.

Boolean algebra and logic gates: Axiomatic definition of boolean algebra-Basic theorems and properties-Boolean functions-Canonical and standard forms-Logic operations-Digital Logic gates

Gate level minimisation: Karnough map-two,three,four and five variable maps-POS simplification-Don't care conditions-NAND and NOR implementation-Exclusive OR function-QuineMcClusky Technique

Module II

Combinational Logic : Combinational Circuits-Analysis procedure-Design procedure-Binary adder-subtracter-Fast adders-Decimal adder-Binary multiplier-Magnitude comparator-Decoders-Encoders-Multiplexers and demultiplexers

Synchronous sequential circuits: Sequential circuits-Latches and Flipflop-Analysis of clocked sequential circuits-State reduction and analysis-Design procedure

Module III

Registers and Counters: Registers-Shift Registers-Ripple counters-Synchronous counters-Counter with unused states-Ring counter-Johnson counter

Memory and Programmable Logic: Random Access Memory-Memory decoding-Error detection and correction-Read Only Memory-Programmable Logic Array-Programmable Array Logic-Sequential programmable devices

Module IV

Asynchronous Sequential circuits: Analysis procedure-Circuits with Latches-Hazards

Digital Integrated circuit: IC digital logic families-Characteristics:-Fan out-Power dissipation-Propagation delay-Noise Margin. RTL and DTL circuits-Transistor Transistor Logic-Emitter coupled Logic-CMOS Logic-CMOS transmission gate circuit

References:

1. M.Morris Mano , Michael D.Ciletti, Digital Design, 4/e, Pearson Education,2009, ISBN:978-81-317-1450-8
2. Herbert Taub,Donald Schilling ,Digital Integrated Electronics, Mc Graw Hill Education,ISBN:978-00-702-6508-0
3. Thomas L. Floyd, Digital Fundamentals, 10/e, Pearson Education ,2011,ISBN:978-81-317-3448-3
4. Yarbrough, Digital Logic-Apllications And Design , Thomson Learning, ISBN:981-240-062-1
5. M.Morris Mano, Digital Logic and Computer Design, 1/e, Pearson Education, ISBN: 978-81-775-8409-7

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/IT 1303 DISCRETE COMPUTATIONAL STRUCTURES

Module I

Logics and Proofs ,propositions, conditional propositions and logical equivalences, quantifiers, proofs resolution, mathematical induction ,sets ,relations ,equivalence relations, functions.

Module II

Algorithms introduction, notations, recursive algorithms, complexity of algorithm, counting methods and pigeon hole principle, recurrence relations.

Module III

Graph theory, paths and cycles, Hamiltonian cycles, representation of graphs, Eulerian paths, traveling sales man problem, trees, characterization, spanning trees, game trees.

Module IV

Algebraic systems semi groups, monoid, subgroups, homomorphism, isomorphism, automorphism , rings, sub rings, posets, lattice, hasse diagrams

References:

1. Satinder Bal Gupta - Discrete Mathematics and Structures, University science Press (Laxmi publications(P) Ltd.) ISBN : 978 – 81 – 318 – 0452 – 0, Fifth edition
2. N.Chanrasekaran, M.Umaparvathi – Discrete Mathematics, ISBN : 978 – 81 – 203 – 3938 - 5, PHI Learning
3. Thomas Koshy – Discrete Mathematics with Applications, (Indian Reprint 2010)ISBN : 978 – 81 – 8147 – 887 – 0, ELSEVIER
4. Malik D. S., Sen S. K - Discrete Mathematical Structures, Thomson Learning.
5. Richard Johnsonbaugh - Discrete Mathematics Pearson Education fifth edition.
6. G.Suresh Singh - Graph Theory, PHI Learning.
7. Garry Haggard, John Schlipf, Sue Whitesides, Discrete Mathematics for Computer Science, Thomson Learning.
8. Bernard Kolman, Robert C Busby, Sharon Cutler Ross, Nadeem-ur-rehman Discrete mathematical structures, Pearson Education.
9. J P Tremblay and Manohar Mc Graw Hill - Discrete mathematical structures with applications to computer science -
10. John Truss Addison Wesley- Discrete mathematical structures for Computer science.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/IT 1304 OBJECT ORIENTED PROGRAMMING

Module I
Object oriented technology, comparison with procedural programming (C and C++),key concepts of object programming, input and output in C++, declarations ,control structures, functions

Module II
Classes and Objects, declaring objects, accessing member variables, defining member functions, inline functions, static member variables and functions, friend function, overloading, constructors and destructors, overloading constructors, copy constructors anonymous objects, dynamic initialization using constructors, dynamic operators and constructors, recursive constructors encapsulation

Module III
Inheritance, types of inheritance, virtual base class, abstract class, advantages and disadvantages of inheritance, pointers and arrays, C++ and memory

Module IV
Binding, polymorphism and virtual functions, generic programming with templates, exception handling, string handling and file handling

References:

1. Object oriented programming with ANSI and TURBO C++ ,Ashok N Kamthane , Pearson education 7th impression 2009.
2. Object oriented programming with C++ M.P.Bhave, S.A.Patekar, Pearson Edn.
3. "Object Oriented Programming in C++" Robert Lafore, 4/e Pearson Edn.
4. Programming a Practical Approach, Madhusudan Mothe, Pearson Edn
5. C++ Programming :From Problem Analysis To Program Design, Malik, Thomson Learning
6. Computer Science :A Structured Approach Using C++,2nd Ed., Forouzan, Thomson Learning
7. Object Oriented Programming Using C++, 2/e, Ira Pohl, Pearson Edn.

Type of Questions for University Exam.
Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)
Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS1305 PRINCIPLES OF PROGRAMMING LANGUAGES

Module I

Programming domains. Language Evaluation.Programming paradigms -Imperative programming,Functional programming,Object oriented programming,Logic programming. Formal methods of describing syntax and semantics - Backus Naur Form, Attribute grammars. Describing semantics - Denotational semantics.

Module II

Data types, Names, Variables, Bindings, Scope and lifetime, Referencing Environments-Named Constants-Variable Initialization-Subprograms-Parameter Passing-Coroutines.

Module III

Data abstraction and encapsulation. Polymorphism and inheritance. Features of object-oriented languages - Smalltalk,C++ and Java.Design and implementation issues. Exception handling.

Module IV

Functional programming languages - Lambda calculus - Introduction to pure LISP . Application of functional programming languages. Logic programming languages - a brief introduction to predicate calculus - Horn clauses - Logic programming. Introduction to Prolog. Applications of Logic programming.

References:

1. Robert W.Sebesta, "Concepts of Programming Languages", 8th edition, Addison Wesely
2. Ravi Sethi, "Programming Languages-concepts and constructs",2nd edition, Addison Wesely, ISBN:81-7758-422-7.
3. Michael L. Scott, "Programming Language Pragmatics – 3rd edition, Morgan Kaufmann
4. Kenneth.C.Louden, "Programming Languages:Principles And Practices" ,2nd edition.,Thomson Learning.
5. Terence W. Pratt, "Programming Languages", 4th edition, Prentice Hall
6. Bjarn Stroustrup, "Design and Evolution of C++", Addison Wesley
7. Ken Arhold, James Gosling and David Holmes "Java Programming Language", 4th edition, Addison Wesley,
8. Allen B.Tucker, Robert E Noonan, Programming Languages Principles and Paradigms,2nd edition, Tata McGraw Hill.
9. Ramesh Vasappanavara, Anand Vasappanavara, Gautam Vasappanavara, Object- Oriented Programming Using C++ and Java, Pearson, ISBN:978-81-317-5455-9.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS /EB/EE 1306 ELECTRONIC DEVICES AND CIRCUITS

Module I

DC power supplies - power transformers - rectification - half wave , full wave, bridge - expression for ripple factor, efficiency, comparison, diode ratings. filters - capacitor - inductor LC filters- use of bleeder resistor - voltage multipliers - dual power supplies - zener and avalanche diodes - simple and series voltage regulator. Special semiconductor devices: Principles and operation of photodiodes, PIN diodes, phototransistors, LED, UJT. MOSFET- Enhancement and depletion types - NMOS, PMOS and CMOS -basic principles & characteristics.

Module II

Small Signal amplifiers: Bipolar junction transistor – configurations, characteristics - current amplification factors - relations between alpha & beta – comparison. BJT amplifiers: Biasing techniques of BJT-stabilization of operating point - h-parameters - CE RC coupled amplifier - concept of load lines- frequency response of RC coupled amplifier - lower cut-off frequency - upper cut-off frequency - 3 db bandwidth.
FET Amplifiers: Principle of operation, characteristics, Common source amplifier, frequency response-applications

Module III

Power amplifier - classification - class A, B, AB and C power amplifiers-tuned amplifier- pushpull and complementary symmetry power amplifier .
Feed-back amplifiers: concept of Negative and positive feedback – Bark Hausen criteria -low frequency sinusoidal oscillators
High frequency oscillators – types- LC, Crystal oscillators –circuit diagram-description-applications

Module IV

Pulse Circuits:-Different types Pulse circuits - pulse characteristics - Pulse shaping using RC circuits - Differentiating and integrating circuits –applications. Clipping and clamping circuits using diodes - Transistor as a switch– simple sweep circuits-bootstrap sweep.
Multivibrators-astable, monostable and bistable ciruits using BJTs-applications

References:

1. Boylestead & Neshelsky: ,"Electronic Devices & Circuit Theory", PHI2003
2. Millman & Halkias, "Electronic Devices & Circuits", TMH, New Delhi.1996
3. Taub & Schilling, Pulse, Digital and Switching ciruits, TMH, New Delhi
4. Bapat Y N, "Electronic Devices & Circuits", Tata McGraw Hill, New Delhi.1995
5. Allan Mottorshed, " Electronic Devices & Circuits", PHI, New Delhi.
6. Schilling & Belove "Electronic Circuits, Discrete & Integrated", TMH, New Delhi 1989
7. Theodore F.Bogart: "Electronic Devices & Circuits" Universal Book Stall, New Delhi 1992

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 13L1 ELECTRONICS CIRCUITS LABORATORY

1. Study of Multimeter, Signal generators, CRO etc. and measurement of electrical quantities
2. Testing of Passive and Active components - Resistors, Capacitors, inductors, Transformers, diodes, Transistors, etc.
3. Characteristics of Active devices –Diode, CE of BJT
4. Rectifying circuits
   i) HW rectifier
   ii) FW rectifier
   iii) FW Bridge rectifier
   iv) Filter circuits - Capacitor filter,
   (Measurement of ripple factor)
5. Differentiating circuit and integrating circuit.
6. Clipping & Clamping circuits.
7. Amplifying circuits Simple common emitter amplifier configuration - gain and bandwidth.
8. Oscillators – RC phase shift or Wein Bridge
9. Multivibrators – Astable only.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CS/IT 13L2 OBJECT ORIENTED PROGRAMMING LABORATORY

Exercises to make the students understand the following concepts

- Difference between struct and class
- Data abstraction
- Data encapsulation and information hiding
- Inheritance
  - Single inheritance
  - Multiple inheritance
  - Multilevel inheritance
  - Hierarchical inheritance
- Abstract class
- Operator overloading
- Function overloading
- Over-riding
- Pointers and arrays
- Files

References:

1. Object oriented programming in C++-Balaguruswamy, Fifth edition, Tata McGraw-Hill, ISBN: 978-0071072830.
2. Object oriented programming in C++-Robert Lafore, Third edition, Galgotia Publications, ISBN: 978-8175152694.
3. The c++ programming Language-Bjarne Stroustrup, Third edition, Pearson, ISBN: 978-8131705216.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CE/CS/EB/EC/EE/EI/FT/IT/ME/SE 1401 ENGINEERING MATHEMATICS III

Module I

Complex Analytic functions and conformal mapping: curves and regions in the complex plane, complex functions, limit, derivative, analytic function, Cauchy – Riemann equations, Elementary complex functions such as powers, exponential function, logarithmic, trigonometric and hyperbolic functions.

Conformal mapping: Linear factional transformations, mapping by elementary function like Z^2, e^z, sin z, cosz, sin hz, and Cos hz, Z + 1/Z

Module II

Complex integration: Line integral, Cauchy's integral theorem, Cauchy's integral formula, Taylor's series, Laurent's series, residue theorem, evaluation of real integrals using integration around unit circle, around the semi circle, integrating contours having poles, on the real axis.

Module III

Partial differential equations:

Formulation of partial differential equations.

Solutions of equations of the form F (p,q) = 0, F(x,p,q) = 0, F(y,p,q) = 0, F(z,p,q) = 0 F1(x,p) = F2 (y,q), Lagrange's form Pp+Qq = R

Linear homogeneous partial differential equations with constant co-efficient

Module IV

Vibrating string: one dimensional wave equation, D'Alembert's solution, solution by the method of separation of variables

One dimensional heat equation, solution of the equation by the method of separation of variables,

Solutions of Laplace's equation over a rectangular region and a circular region by the method of separation of variables.

References:

1. R.K.Jain, S.R.K.Iyengar, Advanced Engineering Mathematics, Narosa Publishers.
2. C.R.Wilie and L.C.Barrett Advanced Engineering Mathematics, Mc-Graw Hill.
3. Erwin Kreyszig, Advanced Engineering Mathematics, Wilsey Eastern.
4. Churchill R.V, Complex Variables & Applications, Mc-Graw Hill.
5. M.C.Potter, J.L.Goldberg. Advanced Engineering Mathematics, Oxford Unversity Press.
6. B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/EB 1402 MICROPROCESSORS

Module I

Introduction to 8 bit microprocessor: Microcomputers and microprocessors, 8/ 16/ 32/ 64-bit microprocessor families; Internal architecture of Intel 8085 microprocessor: Block diagram, Registers, Internal Bus Organization, Functional details of pins, Control signals, External Address / Data bus multiplexing, Demultiplexing, I/ O mapped I/ O, and memory mapped I/ O techniques.Interrupts, Serial communication and DMA features

Module II

Assembly Language Programming: 8085 instruction set: Instructions, Classifications, Addressing modes, Stack and Subroutines, Delay routines, Counters etc. Programming examples.

Module III

Instruction Timing and Interrupts: Timing Diagrams (of various instructions): T- state, Machine cycle (Opcode fetch, Read / Write, Interrupt Acknowledge, Bus Idle, etc), Interrupts: -types (h/ w and s/ w), Maskable / Non maskable, their organization.

Module IV

Interfacing concepts and devices:

Memory interface: Concept of memory chip/ chips interface to 8085 with appropriate examples Programmable interfacing devices: - Programmable peripheral interface (Intel 8255), Programmable timer interface (Intel 8253/ 54), Programmable display / Keyboard interface (Intel 8279), Programmable serial communication interface (Intel 8251)-(their architecture, register organization, initialization, hardware and software interface to 8085.

References:

1. Gaonkar: Microprocesors, Architecture, Programming and Applications, Wiely Eastern, 4th ed.
2. K. UdayaKumar, B.S. Umasankar, "The 8085 Microprocessor-Architecture, Programming and Interfacing", 5e, ISBN : 978 – 81 – 7758 – 455 - 4
3. Nagoor Kani, Microprocessors, architecture and programming, RBA Publications, 2004
4. Douglas V. Hall , Microprocessors, Interfacing and Peripherals, Tata McGraw Hill,2nd ed.
5. S. P. Chowdhuray, Sunetra Chowdhuray, Microprocessors and Peripherals, SCITECH, 2004
6. Ghosh and Sridhar: 0000 to 8085 Microprocessors for Engineers and Scientists,PHI, 2nd ed.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1403 COMPUTER ARCHITECTURE AND ORGANISATION

Module I

Basic structure of computers – Functional units – Basic operational concepts – Bus structures – Instructions & instruction sequencing. Hardware and software - Addressing modes – Assembly language – Stacks &Subroutines

Module II

Processing Unit – Fundamental concepts – Execution of a complete instruction - Hardwired control unit- micro programmed control - control signals - microinstructions- micro program sequencing- Branch address modification- Pre-fetching of micro instructions- Emulation.

Computer arithmetic - logic design for fast adders - multiplication - Booth's algorithm - Fast multiplication - integer division - floating point numbers and operations.

Module III

Memory organization-Semiconductor RAM memories- internal organization of memory chips- Static and Dynamic memories - cache memories - mapping functions- replacement algorithms - virtual memory - address translations – performance considerations – interleaving - Secondary storage.

Module IV

Input-output organizations - interrupts – Enabling & Disabling interrupts - handling multiple devices - device identification - vectored interrupts - interrupt nesting –Simultaneous requests – DMA - Buses - I/O interface circuits –Standard I/O interfaces.

References:

1. Hamacher C. V., "Computer Organisation – International Edition -5th Edition", Mc.Graw Hill, NewYork
2. Stallings William, "Computer Organization and Architecture Designing for Performance",8th Edition, Pearson Education ,2003
3. Pal Chaudhary P, "Computer Organisation and Design " , Prentice Hall, New Delhi,
4. Hayes J P , "Computer Organisation and Architecture - 2nd Edition ", Mc Graw Hill,
5. Tanenbaum A S , "Structured Computer Organisation - 3rd Edition", Prentice Hall,
6. Behrooz Parhami, Computer Architecture from Microprocessors to Supercomputers Oxford Indian Edition
7. Kai Hwang & Faye A Briggs "Computer Archtecture and Parallel Processing "Mc.Graw Hill.,NewYork –1985
8. D.A Pattersen and J.L Hennesy ,"Computer Organization and Design: The hardware/software Interface 2nd Edition", Harcourt Asia private Ltd. (Morgan Kaufman),Singapore 1998

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

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CS 1404 AUTOMATA LANGUAGES AND COMPUTATIONS

Module I

Finite state systems: NFA ,DFA, Definitions. Equivalence of NFA and DFA, NFA to DFA conversion, NFA with epsilon transitions, Elimination of epsilon transitions, Minimization of Finite Automata, Finite automata with output, Applications of Finite Automata.
Regular Expressions: Definitions, Equivalence of regular expression and finite automata, Conversion between regular expression and FA, Pumping Lemma and its application, closure properties of Regular sets

Module II

Context Free grammars (CFG): Definition, Derivations, parse trees, ambiguity , Simplification of grammars, Conversion to Normal Forms: Chomsky, Greibach . Pumping lemma for Context free languages, application of pumping lemma, Closure Properties of CFL , decision algorithms for CFL. Pushdown Automata: Definition, Design examples, Equivalence of acceptance by final state and empty stack, Equivalence of PDA and CFG.

Module III

Turing machine(TM): Model of TM, Design examples, Techniques for construction of TM: storage in the state, multiple tracks ,subroutines. Church's Thesis, Universal TM

Module IV

Recursive and recursively enumerable languages, halting problem of TM , Chomsky Hierarchy. Regular grammars: equivalence of regular grammar and FA , converting regular grammar to Finite Automata, Converting Finite Automata to regular grammar, Definition of Linear Bound Automata and Context Sensitive Grammars

References:

1. J E Hopcroft , Rajeev Motwani, J D Ullman Introduction to Automata Theory ,Languages and Computation, Pearson Education, 3rd Edition 2011 ISBN 978-81-317-2047-9
2. K.L.P Misra and N.Chandrasekharan, Theory of Computer Science , Automata,Languages and Computation ,Prentice Hall , 3rd Edition ,2010 ISBN 978-81-203-2968-3
3. K.V.N Sunitha, N.Kalyani : Formal Languages and Automata Theory, Tata McGraw Hill, 1st Edition, ISBN 978-0-0-07-070205-9
4. C.K.Nagpal, Formal Languages and Automata Theory, Oxford University Press ISBN 978-0-19-807-106-8.
5. S.N.Sivadandam, M.Janaki Meena, Theory of Computation, I.K.International Publishing House, 1st Edition, ISBN 978-93-80026-20-6.
6. Rajendra Kumar, Theory of Automata Languages & Computation., Tata McGraw Hill, 1st Edition 2010, ISBN 978-0-07-070204-2.
7. John Martin, Introduction to Language and Theory of Computation, TMH, Special Indian Edition 2007, ISBN 978-0-07-066048-9.
8. Finite Automata and Formal Languages, A.M.Padma Reddy, Pearson Education, 1st Edition, 2011, ISBN 978-81-317-6047-5.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/IT 1405 DATA STRUCTURES AND ALGORITHMS

Module I

Introduction to Data structures - Arrays & sparse matrices – representation, Searching - linear, binary, Fibonacci – Sorting – selection, bubble, insertion, quick, merge, heap, Introduction to external sorting, Hash tables – Hashing functions

Module II

Linked lists – singly, doubly and circular lists, Application of linked lists – Polynomial manipulation, Stacks – Implementation of stacks using arrays and lists – Typical problems – Conversion of infix to postfix – Evaluation of postfix expression . Queues & Deques – implementation., priority queues

Module III

Trees, Definition and mathematical properties. Representation – sequential, lists - Binary trees – Binary tree traversals – pre-order, in-order & post-order, Expression trees . Threaded binary trees . Binary Search trees . AVL trees

Module IV

Graphs – Graph representation using adjacency matrices and lists – Graph traversals – DFS, BFS - shortest path – Dijkstra's algorithm, Minimum spanning tree – Kruskal Algorithm, prims algorithm – Binary search, B trees and B+ trees.

References:

1. Robert Lafore, "Data Structures and Algorithms in Java" , 2/e, Pearson
2. Adam drozdek," Data Structures and Algorithms in Java" ,Thomson Publications, 2nd Edition.
3. Sartaj Sahni, 'Data Structures, Algorithms, and Applications in Java", McGraw-Hill
4. Aaron M.Tanenbaum, Moshe J.Augenstein, Yedidyah Langsam "Data Structures using Java", Pearson Education.
5. Ellis Horowitz and Sartaj Sahni, " An introduction to Data Structures", Computer Science Press,Rockville, MA, 1984
6. David Cousins , "Introducing Data Structures with Java", , Pearson Edn.
7. Jean Paul Tremblay and Paul G Sorenson, "An introduction to Data Structures with Applications",McGraw-Hill, Singapore, 1984
8. ISRD Group, Data structures through C++ Tata McGraw-Hill Education Pvt.ltd

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CS 1406 DATA COMMUNICATIONS

Module I

Data transmission: Communication model-Data Transmission: Concepts and Terminology- Analog and Digital Data – Analog and Digital Signals-Periodic analog signals-Time and frequency domain-composite signals-Digital signals- Digital signal as composite analog signals-Transmission of digital signals-Transmission impairments -Data rate limits-Noise less channel:-Niquist bit rate-Noisy channel:-Shannon capacity- Performance:-Bandwidth-Throughput-Latency

Transmission Media: Guided Media-Twisted pair cable-Coaxial cable-Fiber Optic cables -Cables and cable standards-Unguided media-Radio waves-micro waves-Infrared-Satellite communication.

Module II

Digital transmission -Digital to Digital conversion: Line coding-Line coding schemes-Block coding-Scrambling Analog to Digital Conversion: PCM- DM- Transmission modes: Parallel transmission-Serial Transmission

Analog Transmission- Digital to Analog conversion: Aspects-ASK-FSK-PSK-QAM- Analog to Analog conversion: AM-FM-PM

Data Compression:- Frequency dependent coding-Huffman coding-LZW Coding

Module III

Digital Data Communication Techniques:_Asynchronous and Synchronous Transmission-Types of Errors-single bit and burst errors-Error Detection: Redundancy- LRC-VRC-CRC-Capabilities and performance of CRC-Error Correction: single bit error correction – Hamming code- Burst error correction-convolution code.

Data Link Control: Line discipline-Flow control-Error control: ARQ-stop and wait ARQ-Continuous ARQ-Line utilisation of different ARQs- Link management- HDLC

Module IV

Multiplexing: Frequency-Division Multiplexing-Synchronous Time-Division Multiplexing-Statistical Time-Division Multiplexing

Spread Spectrum: The Concept of Spread Spectrum-Frequency Hopping Spread Spectrum-Direct Sequence Spread Spectrum-Code-Division Multiple Access

Telephone and cable network: Major components of telephone network- LATAs- Services provided by telephone networks-Dial up modems and standard-Digital subscriber line-ADSL-ADSL Lite-SDSL-VDSL-Cable TV for data transmission: Bandwidth-Sharing-CM and CMTS- Data transmission schemes- DOCSIS

References:

1. Behrouz A. Forouzan, Data Communication and Networking 4/e, McGrahill, 2006. ISBN:978-0-07-06-3414-5
2. William Stallings, Data and Computer Communication, 9/e ,Pearson education,2006. ISBN: 978-0- 13-139205-2
3. Fred Halsal, Data Communication Computer Network and Open Systems, 4/e, Pearson education, 2005.
4. William A. Shay, Understanding Data Communication & Networks, 2/e, Thomson Learning, 2003 ISBN:978-0-53-420244-6
5. Wlliiam Stalling, Wireless Communication and Networks, 2/e,Pearson Education, 2004 ISBN:978-0-13-191835-1

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CS/EB 14L1 DIGITAL ELECTRONICS LABORATORY

1. Study of standard logic gates and universal gates.
2. Arithmetic circuits
    i. Adders & subtractors using standard logic & universal gates.
    ii. Study of 7483 & binary addition & subtraction using 1's & 2's complement.
    iii.BCD adder using 7483.
3. Code converters with mode control, Parity generator/ checkers.
4. Study of MUX, DEMUX, decoder & encoder circuits & their ICs.
5. Flip flops: RS, JK, T, D, master-slave JK flip flops using universal gates
6. Counters
    i. Asynchronous UP, DOWN, UP/DOWN counter using JK Flip flops
    ii. Design and realization of sequence generators.
    iii. Study of IC counters 7490, 7492, 7493 and 74193.
7. Study of shift registers and design of Johnson and Ring counter using it.
8. Study of seven segment display & decoder driver (7447)
9. Astable and monostable multi-vibrators using TTL gates
10. Transfer characteristics and specifications of TTL gates

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CS/IT14L2 DATA STRUCTURES LABORATORY

1. Simple programming exercises in Java
2 Study of algorithms and implementation in Java programming language for the following:
   - Searching and Sorting
   - Linked Lists- Singly and doubly
   - Stacks – various applications
   - Queues
   - Trees
   - Graphs

References:

1. Data structures and algorithms in JAVA-Robert Lafore, Second edition, Pearson, ISBN: 978-8131718124.
2. Programming with JAVA, a primer- Balaguruswamy, Fourth edition, Tata McGraw-Hill , ISBN: 978-0070141698.
3. Java and Object Oriented programming paradigm-Debasish Jana, First edition, PHI publishers, ISBN: 978-81-203-2775-7.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CE/CS/EB/EC/EE/EI/FT/IT/ME/SE 1501 ENGINEERING MATHEMATICS IV

Module I

Probability distributions: random variables (discrete & continuous), Probability density, mathematical expectation, mean and variance of a probability distribution, binomial distribution, Poisson approximation to the binomial distribution, uniform distribution, normal distribution.

Curve fitting: method of least squares, correlation and regression, lines of regression.

Module II

Sampling distributions: Population and samples, the sampling distribution of the mean unknown(σ known), the sampling distribution of the mean (σ)the sampling distribution of the variance, point estimation, interval estimation, tests of hypotheses, null hypotheses and significance tests, hypothesis concerning one mean, type I and type II errors, hypotheses concerning two means. The estimation of variances: Hypotheses concerning one variance – Hypotheses concerning two variances.

Module III

Finite difference Operators: $\blacktriangledown$, Δ E, δ, μ, $x^{(n)}$

Newton's Forward and Backward differences interpolation polynomials, central differences, Stirlings central differences interpolation polynomial. Lagrange interpolation polynomial, divided differences, Newton's divided differences interpolation polynomial.

Numerical differentiation: Trapezoidal and Simpson's rules, compounded rules, errors of interpolation and integration formulae. Gauss quadrature formulae (No derivation for 2 point and 3 point formulae)

Module IV

Numerical solutions of ordinary differential equations: Taylor series method, Euler's method, modified Euler's method, Runge-Kutta formulae 4^{th} order formula,

Numerical solution of boundary value problems: Methods of finite differences, finite difference methods for solving Laplace's equation in a rectangular region, finite differences methods for solving the wave equation and heat equation.

References:

1. Irvrin Miller & Freiend, Probability And Statistics For Engineers, Prentice Hall of India.
2. S.S.Sastry, Numerical Methods, PHI Publishers.
3. P.Kandaswamy.K.Thilagavathy, K.Gunavathy, Numerical Methods, S.Chand & Co.
4. A.Papoulis, Probability, Random Variables and Stochastic Processes, Mc-Graw Hill.

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CS 1502 SYSTEM PROGRAMMING

Module I

Assemblers: Overview of the assembly process - Machine dependent assembler features-Machine independent assembler features-Design of two pass assembler-single pass assembler.

Module II

Loaders and linkers -Loader functions-program relocatability- absolute and bootstrap loader-Overview of linkage editing-linking loader-Dynamic linking-Design of the linkage editor.

Module III

Macroprocessors - macro definition and usage-Schematics for Macro expansion-Generation of unique labels-Conditional macro expansion- Recursive macro expansion-Design of a Macro pre-processor-Design of a Macro assembler.

Module IV

Operating Systems – Basic Operating Systems functions – Types of Operating Systems – User Interface – Run-time Environment. Operating Systems Design Options – Hierarchical Structures – Virtual Machines – Multiprocessor Operating Systems – Distributed Operating Systems – Object Oriented Operating Systems.

References:

1. Leland L.Beck, "System Software - An Introduction to System Programming", 3rd edition, Addison Wesely
2. John J. Donovan, "Systems Programming", McGraw Hill, 2009
3. D.M.Dhamdhere, "System Programming and Operating Systems", 2nd edition. Tata McGraw Hill
4. D.M. Dhamdhere "System Programming", McGraw Hill, 2011
5. Srimanta Pal "Systems programming" – Oxford Higher Education, 2011

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CS/IT 1503 SOFTWARE ENGINEERING

Module I

Software Life Cycle - Water fall model – Prototyping – Spiral model – pros and cons of each model.
Requirements Analysis - SRS – DFD – ER Diagrams – Decision tables – Decision Trees – Formal specification techniques: Axiomatic and Algebraic specifications - Petrinets

Module II

Software Design: Design Heuristics – Cohesion and Coupling
Design Methodologies - Structured analysis and design, Architectural Design, Interface design, Component Level design.
Software Reuse and Software Maintenance issues.

Module III

Introduction to Software Quality Management - Software Testing - Objectives of testing – Functional and Structural testing –Generation of test data - Test Plan - Unit testing – Integration testing – System testing – Test reporting.
Overview of SQA Planning – Reviews and Audits – Software configuration
management - Quality Standards - Study of ISO9000 & CMM

Module IV

Software Project Management - Brief study of various phases of Project Management – Planning – Organizing – Staffing – Directing and Controlling
Software Project Cost Estimation – COCOMO model – Software Project Scheduling
CASE tools: CASE definitions – CASE Classifications – Analysis and Design Workbenches, Testing Workbenches

References:

1. Fundamentals of Software Engineering– Rajib Mall, Second edition, PHI, ISBN: 978-8-12-032445-9.
2. Software Engineering – Roger S. Pressman, Seventh illustrated edition, McGraw-Hill, ISBN: 978-0-07-337597-7.
3. Software Engineering – Pankaj Jalote, Third illustrated edition, Springer books, ISBN: 978-0-38-720881-7.
4. Software Quality assurance-Milind Limaye-First edition, Tata McGraw-Hill, ISBN:978-0-07-107252-6.
5. Software Testing-Principles, testing and tools-M.G.Limaye, First edition, Tata McGraw-Hill, ISBN:978-0-07-013990-9.
6. Managing Software Projects-Frank Tsui, illustrated edition, Jones and Barlett learning, ISBN: 9780763725464.
7. Software engineering-David Gustafson, First edition, Schaum's outline series, ISBN: 978-0-07-053101-7.
8. Software engineering-principles and practices-Deepak Jain, First edition, Oxford Higher education publications, ISBN: 978-0-19-569484-0.
9. Software Project Management – Richard Thayer, Second Illustrated edition, IEEE Computer Society, ISBN No: 978-0-81-868000-7.

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Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

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CS1504 COMPUTER GRAPHICS

Module I

Introduction to Computer Graphics: Overview of Computer Graphics-Raster refresh graphics displays-CRT-Flat Panel Displays-Hard copy output devices-Logical interactive Devices-Physical interactive devices-Data generation devices-Graphical user interfaces

Raster Scan Graphics: Line Drawing algorithms-Digital Differential Analyser-Bresenham's algorithm:-Integer Bresenham's algorithm,General Bresenham's algorithm,Faster line rasterisation algorithm-Circle generation-Ellipse generation-General function rasterisation-Scan conversions-Displaying line character and polygons-Polygon filling:-Scan converting polygons,Edge fill algorithm,Seed fill algorithms-Antialiasing-Halftoning

Module II

Two dimensional transformations: Representation of points-Transformations and matrices-transformation of points-Transformations of lines-Rotation-Reflection-Scaling-Combined transformations-Homogeneous coordinates

Windowing and clipping: Viewing transformations-Point clipping-Cohen Sutherland line clipping-Lian Brsky 2D Line clipping-Sutherland Hodge man Polygon clipping-Weiner Atherton algorithm-Curve clipping-Text clipping

Plane and Space curves: Curve representation-Nonparametric curves-Parametric curves-Representation of space curves-Spline curves-Geometric and parametric continuity - Cubic Splines-Brazier curves-B-spline curves

Module III

Three Dimensional Transformations and Projections: Three dimensional scaling, shearing,rotation, reflection, translations - Rotation about arbitrary axis Parallel to coordinate axis- Rotation about arbitrary axis in space- Affine and perspective geometry-Otho graphic projections-Taxonomic projections-Oblique projections-Vanishing points-Stereographic projections

Surface Description and Generation: Surface of revolution-Parametric representation of surfaces-Sweep surfaces-Quadratic surfaces-Bazier surfaces-B-spline surfaces

Visible Lines and surfaces: Back Face detection method—Depth buffer method(z-Buffer algorithm)- A-Buffer method-Screen subdivision method-Painter's algorithm-Scan line algorithms

Module IV

Rendering and color models: Illumination model-Determining surface normal and reflection vector- Gouraud shading-Phong Shading-Texture mapping-Ray tracing- Color- Chromacity-Tristimulus theory of color-RGB color system -CMYK color system -HSV color system -HLS color system-Ostwald color System

Modelling techniques and fractals: Surfaces and hierachical modelling- Hierarchical modelling with structures – Fractals

Animation: Devices for producing animation-Computer asisted animation-Video formats-Real-Time animation techniques

References:

1. David F.Rogers, Procedural Elements for Computer Graphics, Second Edition,Tata McGraw-hill,2001,ISBN-13:978-0-07-047371-3, ISBN-10:0-07-047371-4
2. David F.Rogers, Mathematical Elements for Computer Graphics, Second Edition,Tata McGraw-Hill,2001,ISBN-13:978-0-07-048677-5,ISBN-10:0-07-048677-8 (Transformations and curves in Module 2 and 3)
3. Amarendra N Sinha, Aurn D Udai , Computer Graphics , Tata McGraw-hill,2011, ISBN-13:978-0-07-063437-4, ISBN-10:0-07-06347-8
4. Donald Hearn ,M Pauline Baker, Computer Graphics C version, 2/E Pearson Education ,2003, ISBN:978-0-13-530924-7
5. Donald Hearn ,M Pauline Baker, Computer Graphics with OpenGL, 3/E, Pearson Education ,2004, ISBN:978-0-13-015390-6
6. James D.Foley, Andries Van Dam,Steven K.Feiner, John F.Hughes, Computer Graphics Principles

and Practice in C , 2/2, Pearson education, 2007, ISBN: 978-81-317-0505-6
7. Newmann W and Sproull R.F., Principles of Interactive Computer Graphics, 2/e, McGraw-Hill,1997, ISBN: 978-0-07-463293-2
8. C.S.Verma, Computer Graphics, Ane Books, 2011,ISBN: 978-93-8061-811-1
9. Edward Angel, Interactive Computer Graphics A Top-Down approach Using OpenGL, 5/e, Pearson, ISBN: 978-81-317-2530-6.

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Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1505 DATABASE MANAGEMENT SYSTEMS

Module I

Introduction: Characteristics of the Database approach – Data models, schemas and instances – DBMS architecture – Data independence – Database languages and interfaces – Database administrator – Data modeling using Entity - Relationship (ER), Entity sets, attributes and keys - Relationships, Relationship types, roles and structural constraints - Weak Entity types - Enhanced Entity-Relationship (EER) and object modeling. Sub classes, super classes and inheritance - Specialization and generalization.

Module II

Record storage and file organizations: Placing file records on disks – Fixed length and variable length records - Spanned Vs Unspanned records – Allocating file records on disk– Files of unordered records(Heap files), Files of ordered records(Sorted files).- Hashing Techniques. Indexed structures for files – Types of single level ordered index, multi- level indexes.

Module III

The Relational model: Relational model concepts – Relational model constraints - The Relational Algebra – Relational calculus – Tuple Relational calculus, Domain Relational calculus. - SQL. Database Design: Functional dependencies – Basic definitions – Trivial and non trivial dependencies –Closure of a set of dependencies – Closure of a set of attributes – Irreducible sets of dependencies – Nonloss decomposition and Functional dependencies. First, Second and Third normal forms – Boyce-codd normal form.

Module IV

Transaction Management- Concurrency Control-Lost Updates- Uncommited Data-Inconsistent Retrievals-The Scheduler-Concurrency Control with Locking Methods –Concurrency Control with Time Stamping-Concurrency Control with Optimistic Methods- Database Recovery Management.
Introduction to object oriented databases, Active databases. Data warehouses–Data mining

References:

1. Elmasri and Navathe, "Fundamentals of Database Systems", 5/e, Addison - Wesley, 2011.
2. Peter Rob Carlos Coronel, "Database Systems , Design, Implementation &Management ", 5/e,Thomson Course Technology
3. A Silberschatz, H. F. Korth, and S Sudarshan, "Database System Concepts", 4/e,Tata McGraw Hill,2002
4. Thomas Connoly ,Carolyn Begg " Database Systems",3/e,Pearson Education.
5. C.J Date, " An Introduction to Database Systems ", Addison-Wesley
6. Margaret.H.Dunham ,"Data Mining. Introductory and advanced topics", Pearson Education,2003.
7. Hector Garcia-Molina,Jeffret D. Ullman, Jenniffer Widom ,"Database System implementation", Prentice Hall International, Inc, 2000.

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Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/EB 1506 MICROPROCESSOR BASED SYSTEM DESIGN

Module I

Architecture of 16 bit microprocessors: Architecture and Functional Block Diagram of Microprocessor 8086 — Instruction Sets and Programming - Assembly Language programming – Interrupts: 8086 Interrupts and Interrupts Responses

Modular programming-Assembler instruction format, assembler directives and operators, assembly process, linking and relocation, debugging, stacks, procedures, macros

Module II

8086 hardware design: minimum mode and maximum mode configurations, Bus structure, bus buffering, latching, system bus timing with diagram,

Peripherals and their interfacing: Dynamic RAM interfacing, interfacing I/O ports,,

interfacing with Programmable Interrupt Controller 8259, Programmable DMA interface 8237, DMA transfer and operations.

Multimicroprocessor Systems:Interconnection topologies-interconnection of 8087 with the CPU- architecture of 8087 - Design of a PC based multimicroprocessor system

Module III

Architecture of 32 bit Microprocessors: Intel 80386 Architecture, Block Diagram, Addressing modes, Data Types 80386, Real address mode of 80386 Protected mode of 80386, Segmentation, Paging and Virtual modes.

Advanced microprocessor Architectures – Advanced features, Architecture, register organization & Flag register of Pentium Processor - An Overview of Pentium Pro, Pentium III and Pentium IV processor.

RISC Architecture : RISC & CISC Convergence – Advantages - Basic features of RISC Processors

Module IV

Introduction to micro controllers - comparison with microprocessors Study of micro controller (MCS 51 family- 8051) - Architecture, instruction set, addressing modes and programming. Interfacing to ADC and DAC using microcontrollers

References:

1. Ajoy Kumar Ray, Kishor M.Bhurchandi, Advanced Microprocessors and Peripherals,TMH, ISBN : 0 – 07 – 060658 – 7, New Delhi,2000
2. Nilesh B.Bahadure, MICROPROCESSORS, The 8086/8088, 80186/80286, 80386/80486 and the Pentium Family, ISBN : 978 – 81 – 203 – 3942 – 2, PHILearning
3. Muhammad Ali Mazidi, Janice Gillispie Mazidi, “The 8051 Microcontrollers & Embedded Systems”, ISBN : 81 – 7808 – 574 – 7, 5e-Pearson Education.
4. Douglas V Hall, “MICROPROCESSORS & INTERFACING – Programming and Hardware” 2 edition, ISBN : 0 -07 – 463639 – 1, Tata Mc GrawHill
5. Kenneth Ayala“, The 8051 Microcontroller”, West Publishing Company.
6. Avtar Singh , “ The 8088 and 8086 Microprocessors_programming, Interfacing, Software, Hardware and Applications” PHI
7. Barry B. Brey, "The INTEL Microprocessors - 8086/8088, 80186/80188, 80286, 80386, 80486 Pentium and Pentium pro processor, Pentium II, Pentium III and Pentium IV – Architecture, Programming and interfacing", PHI , 6 Ed, 2003.
8. YU-Cheng Liu & Glenn A Gibson,” Microprocessor System , Architecture Programming & Design”
9. Kenneth Hintz & Daniel Tabak “Microcontroller architecture implementation and programming”, Mc Graw Hill.
10. Intel Users manual for 8086, 80386 & 80486, Pentium & Pentium pro
11. “Microprocessor Systems”, Learning Material Series, ISTE, NewDelhi, 1997
12. John B. Peatman, "Design with microcontrollers" McGraw Hill, Singapore.
13. Kenneth Ayala The 8086 Microprocessor: programming and interfacing the PC Thomson Learning

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 15L1 MICROPROCESSOR LABORATORY

PART I – Programming of 8085 microprocessor (10 Lab sessions)

1. Study of a typical microprocessor trainer kit and its operation.
2. Simple Programming examples using 8085 instruction set to understand the use of various instructions and addressing modes – at least 20 examples.
3. Implementation of code converters, counters (Up & Down Counters), real time clock.

PART II – Interfacing of peripheral devices (5 Lab sessions)

1. Interfacing and programming of 8255.
2. Interfacing and programming of 8279.
3. Interfacing and programming of 8253.
4. A/D and D/A converter interface.
5. Stepper motor interface

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CS 15L2 COMPUTER GRAPHICS LABORATORY

Module I

1. Study of graphical input and display devices
2. Study of different display standards

Module II

1. Study of OpenGL libraries and programming techniques
2. Programming using Open-GL libraries in C,C++ or Java

Implementing Line, Circle and Ellipse drawing algorithms
Implementing Seed filling algorithms
Implementing scan line filling method

Module III

1. Implementing 2D and 3D transformations (Use Homogeneous coordinate system
2. Implement line clipping algorithms
3. Implement polygon clipping algorithms for convex and concave polygons
4. Implement text and curve clipping methods

Module IV

1. Programs for generating Space curves
2. Programs for hidden surface elimination
3. Programs for rendering polygon surfaces
4. Simple animation techniques
5. Generating fractal images

References:

1. Edward Angel, Interactive Computer Graphics A Top-Down approach Using OpenGL, 5/e, Pearson, ISBN: 978-81-317-2530-6.
2. David F.Rogers, Procedural Elements for Computer Graphics, Second Edition,Tata McGraw-hill,2001,ISBN- 13:978-0-07-047371-3, ISBN-10:0-07-047371-4
3. Donald Hearn ,M Pauline Baker, Computer Graphics with OpenGL, 3/E, Pearson Education ,2004, ISBN:978-0-13-015390-6
4. Mason Woo et.al, OpenGL Programming Guide – The official guide to OpenGL, 3rd Edition, OpenGL Architecture Review board
5. Noman Lin, Linux 3D Graphics Programming, Worldwide Game Development Library.

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CS 1601 DIGITAL SIGNAL PROCESSING

Module I

Introduction to signals & systems- Discrete time signals and systems- Properties of discretesystems-inearity,timeinvariance-causality-stability.convolution.difference equation representation of discrete systems - The Z transform-properties of Z transform- the inverse z transform-System Transfer function.

Module II

Frequency domain representation of discrete time signals. Discrete Fourier series(DFS)-properties Discrete Time Fourier Transform (DTFT) properties, Discrete Fourier Transform(DFT) properties& Fast Fourier Transform(FFT) Decimation in Time & Decimation in Frequency algorithms.

Module III

FIR digital Filters: Transfer function. Generalized Difference equation representation. Concept of windowing. Non Recursive realization structures-direct (Tapped delay line structure) –cascade realization- Liner phase realization.

IIR Digital Filters : - Transfer function. Difference equation representation. Recursive Realizations Direct form I , Direct form II –Cascade Realization-Parallel realization – Comparison of IIR & FIR filters in terms of computational complexity, memory requirement, hardware complexity, stability .

Module IV

Finite word length effects in digital filters- fixed point arithmetic -Floating point arithmetic- Block floating point arithmetic - Truncation-Rounding - Quantization error in analog to digital conversion-Limit cycles. General DSP architecture- features _ On chip subsystems- memory organization-Addressing modes-Instruction types - TMS320C54X fixed point processor- TMS320C4X floating point processor

Applications of DSP

References:

1. P.Ramesh Babu: Digital signal Processing,SCITEC Pub., 3rd ed
2. Sanjit K. Mithra, : " Digital Signal Processing", Tata Mc- Graw Hill
3. Cristi, Modern Digital Signal Processing, Ed. 1.
4. Ashok Ambardar, Analog and Digital Signal Processing, Edition 2.
5. Avatar Singh, Digital Signal Processing Implementations, Edition 1
6. John G Proakis & Dimitris G Manolakis : "Digital Signal Processing", PHI, New Delhi
7. Oppenheim & Ronald W Schafer : "Digital Signal Processing", Prentice Hall India
8. Sanjit K. Mithra, : " Digital Signal Processing", Tata Mc- Graw Hill

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/IT 1602 COMPILER CONSTRUCTION

Module I

Compiler: Introduction – Analysis of the source program – phases of a compiler – Lexical analysis – Role of the lexical analyser – Input Buffering -- Specification of tokens – Recognition of tokens – Lexical analyser generators.

Module II

Syntax Analysis – Role of the parser – Context free grammars – Top-down parsing – Bottom-up parsing – Operator precedence parsing – LR parsers (SLR, Canonical LR, LALR) – Parser generators.

Module III

Syntax-directed translation – Syntax-directed definitions – S-attributed definition – L-attributed definition – Top-down and bottom-up translation – Type checking – Type systems – Specification of a type checker. Run time environment – Source language issues – Storage organization – Storage allocation strategies – Access to nonlocal names – Symbol tables.

Module IV

Intermediate code generation – Intermediate languages – Declaration – Assignment Statement – Boolean expression – Procedure calls - Code optimization – Introduction – Sources of optimization – Introduction to data flow analysis. Code generator – Issues in the design of a code generator, the target machine, A simple code generator.

References:

1. Alfred V. Aho, Ravi Sethi & Jeffrey. D. Ullman, "Compilers Principles, Techniques & Tools", Pearson
2. Kenneth.C.Louden, Compiler Construction:Principles And Practice, Thomson Learning, India
3. Keith D. Cooper & Linda Torczon, Engineering a Compiler, 2nd edition, Elsevier, New Delhi.
4. S.S. Muchnick, Harcourt Asra, Advanced Compiler Design implementation, Morgan Kaufman, 1997
5. Alan Holub, Compiler Design in C, PHI

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1603 OPERATING SYSTEM

Module I

Introduction to Operating Systems. Operating system concepts – System calls – Operating System Structure. Processes - Interprocess Communication – Race Conditions - Critical Sections – Mutual Exclusion - Busy Waiting - Sleep And Wakeup -Semaphores - Monitors - Message Passing. Process Scheduling – First come First Served - Shortest Job First - Priority scheduling - Round Robin Scheduling - Multiple queues scheduling – Guaranteed scheduling - Two- level scheduling.

Module II

Memory management. Multiprogramming and memory usage - Swapping - multiprogramming with fixed and variable partitions - Memory management with bit maps, linked lists, Buddy system - Allocation of swap space. Virtual memory - paging and page tables, Associative memory - Inverted page tables. Page replacement algorithms – Segmentation.

Module III

File systems and Input/output. Files - Directories - File system implementation - Security and Protection mechanisms.

Principles of I/O hardware - I/O devices - Device controllers - DMA. Principles of I/O software - Interrupt handlers - Device drivers - Disk scheduling - Clocks and terminals. I/O Buffering - RAID- Disk Cache.

Module IV

Deadlocks - Conditions for deadlock. Deadlock detection and recovery. Deadlock avoidance - resource trajectories - safe and unsafe states – Banker's algorithms. Deadlock prevention. Two phase locking – Non-resource deadlocks - Starvation.

Case Study: UNIX / LINUX operating system

References:

1. Andrew S Tanenbaum, "Modern Operating Systems" , 3rd Edition, Prentice Hall, 2011. ISBN 978-81-203-3904-0.
2. William Stallings, "Operating systems", 6th Edition, Pearson Education, 2011. ISBN 978-81-317-2528-3.
3. Garry Nutt, Nabendu Chaki, Sarmistha Neogy, "Operating Systems", Third Edition, Pearson Education.
4. D.M.Dhamdhere, "Operating Systems", 2nd Edition, Tata McGraw Hill, 2011.
5. Sibsankar Haldar, Alex A Aravind, "Operating Systems", Pearson Education.
6. Achyut S Godbole, Atul Kahate, "Operating Systems", 3rd Edition, Tata McGraw Hill, 2011.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1604 COMPUTER NETWORKS

Module I

Evolution of Computer Networks: Types of Networks: Broadcast and Point-to-point, LAN, MAN, WAN, Wireless networks. Protocols & Standardization, ISO/OSI Reference model, TCP/IP Reference Model.
Application Layer: Application layer protocols:-WWW and HTTP, FTP, DNS, SMTP, SNMP, RPC, P2P File sharing, Domain Name system (DNS)

Module II

Transport layer and Network Layer : Transport Layer Services, Relationship with Network Layer, Relationship with Application Layer, Multiplexing and De multiplexing, UDP, TCP: Header ,Segment Structure, Services, Connection establishment and termination, Flow control and window size advertising, TCP time out and re-transmission, Congestion Control, TCP Fairness, Delay Modeling.
Network layer Services, Datagram and Virtual circuit services, IP datagram format and Types of Services, Datagram encapsulation and Fragmentation, Reassembly and fragmentation

Module III

Routing and Datalink Layer: Routing: Link state routing, distant vector routing, hierarchical routing, multicast routing, Data link layer services: Error detect and correction techniques, Elementary Data link layer protocols, sliding window protocols, HDLC ,Multiple access protocols, TDM, FDM, CDMA Random access protocols: ALOHA, CSMA,CSMA/CD,CSMA/CA. Circuit and Packet Switching, Virtual Circuits, Switching Technology for LAN, Ethernet switches, Virtual LAN

Module IV

Physical Layer, High speed Networks and Network programming: Physical Layer services, Transmission media, Data encoding schemes. ISDN, BISDN, Frame relay, Fast Ethernet and Gigabit Ethernet, FDDI, SONET .NETBIOS programming, TCT/IP and Socket programming.

References:

1. James F. Kurose and Keith W. Ross, Computer Networking – A Top-Down Approach Featuring the Internet,5/e Pearson Education ,2010, ISBN:978-0-13-607967-5.
2. Behrouz A. Fourouzan, Firouz Mosharraf, Computer Networks A Top-Down Approach, Tata McGrawHill, 2012, ISBN: 13978-1-25-900156-7
3. Andrew S. Tanenbaum, Computer Networks , 4/e, Pearson education, 2003, ISBN:978- 8-17-758165-2.
4. S. Keshav, An Engineering Approach to Computer Networking, Pearson education ,2002
5. F. Halsall, Data Communication, Computer Networks and Open Systems, Addison Wesley, 1996
6. Leon-Garcia and I. Widjaja, Communication Networks, Tata McGraw Hill, 2000
7. Bertsekas and Gallagar , Data Networks, 2/e, PHI, 1992
8. Douglas E Comer ,Computer Networks and Internet's, 2/e Pearson Education,2004
9. Gallo, Computer Communication and Networking Technologies, Thomson Learning.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/EB 1605 MODERN CONTROL SYSTEMS

Module I

Basic idea of control systems and their classification - differential equations of systems - linear approximation - Laplace transform and transfer function of linear system - Model of physical system (Electrical, mechanical and electromechanical)- block diagram - signal flow graph - Mason's gain formula.

Module II

Time domain analysis - Representation of deterministic signals - First order system response - S-plane root location and transient response - impulse and step response of second order systems - performance - characteristics in the time domain - effects of derivative and integral control - steady state response - error constant - generalised definition of error coefficients - concepts of stability - Routh - Hurwitz criterion.

Module III

Frequency domain analysis - frequency response, frequency domain performance characteristics. Stability in frequency domain - Bode plot, Polar plot, closed loop frequency response - Nyquist Plot.

Root locus method - basic theory and properties of root loci - procedure for the construction of root loci - Design and compensation of feed back control system – lead,lag and lag-lead compensation - simple design in S-plane.

Module IV

Basic elements of a discrete time control system - sampling - sample and hold - Examples of sampled data systems – pulse transfer function - Review of Z-transforms - system function - mapping between s plane and z plane - analysis of discrete time systems –- examples - stability - Jury's criterion.

Introduction to the state variable concept - state space models - solution of state equations - homogenous case - properties of state transition matrix - state space representation of discrete time systems.

References:

1. Ogata K, Modern Control Engineering, 4th Ed., Prentice-Hall India Ltd /Pearson Education
2. Ogata, Discrete Time Control Systems, 2nd edn., Pearson Education/ Prentice-Hall India Ltd
3. Nagarath & Gopal, Control System Engineering, Wiley Eastern, 2nd ed.
4. Dorf , Modern Control system, Pearson Education, 8th ed.
5. Franklin, Feed back Control Systems, Pearson Education
6. Kuo B. C, Automatic Control System, Prentice-Hall India Ltd, 8th ed.
7. Nagoor Kani, Control Systems, RB Publishers,1998
8. Ogata, Discrete Time Control Systems, 2nd edn., Pearson Education/ Prentice-Hall India Ltd
9. Ramkalyan, Control Engineering, Vikas Publications, 2007
10. M N Bandyopadhyaya, Control Engineering- Theory& Practice , Prentice-Hall India Ltd, 2003

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS1606 E1 SOFTWARE TESTING

Module I

Introduction: Faults, Errors and Failures, Basics of software testing, Testing objectives, Principles of testing, Requirements, behavior and correctness, Testing and debugging, Test metrics and measurements, Verification, Validation and Testing, Types of testing, Software Quality and Reliability, Software defect tracking.

Module II

White Box And Black Box Testing: White box testing, static testing, static analysis tools, Structural testing: Unit/Code functional testing, Code coverage testing, Code Complexity testing, Black Box testing, Requirements based testing, Boundary value analysis, Equivalence partitioning, state/graph based testing, Model based testing and model checking, Differences between white box and Black box testing.

Module III

Integration, System, And Acceptance Testing: Top down and Bottom up integration, Bi-directional integration, System integration, Scenario Testing, Defect Bash, Functional versus Non-functional testing, Design/Architecture verification, Deployment testing, Beta testing, Scalability testing, Reliability testing, Stress testing, Acceptance testing: Acceptance criteria, test cases selection and execution.

Module IV

Test Selection & Minimization For Regression Testing: Regression testing, Regression test process, Initial smoke or Sanity test, Selection of regression tests, Execution Trace, Dynamic slicing, Test Minimization, tools for regression testing, Ad hoc Testing: Pair testing, Exploratory testing, Iterative testing, Defect seeding, Test planning, Management, Execution and Reporting, Software Test Automation: Scope of automation, Design & Architecture for automation, Generic requirements for test tool frame work, Test tool selection, Testing in Object Oriented systems.

References:

1. S.Desikan and G. Ramesh, "Software Testing: Principles and Practices", First edition, Pearson Education, ISBN: 978-8-17-758121-8.
2. Aditya P. Mathur, "Fundamentals of Software Testing", First edition, Pearson Education, ISBN: 81-317-0795-4.
3. Naik and Tripathy, "Software Testing and Quality Assurance", First edition, Wiley, ISBN: 978-0-47-178911-6.
4. K.K.Aggarwal and Yogesh Singh, "Software Engineering", Revised second edition, New Age International Publication, ISBN: 978-8-12-241638-1.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1606 E2 SYSTEM MODELING AND SIMULATION

Module I

Introduction to simulation: Introduction – Simulation Terminologies – Application areas – Model Classification – Types of Simulation – Steps in a Simulation study – Concepts in Discrete Event Simulation – Simulation Examples

Module II

Mathematical Models: Statistical Models – Concepts – Discrete Distribution – continuous Distribution – Poisson Process – Empirical Distributions – Queueing Models – Characteristics – Notation – Queueing Systems – Markovian Models – Properties of random numbers – Generation of Pseudo Random numbers – Techniques of generating random numbers – Testing random number generators - Generating Random – Variates – Inverse Transform technique – Acceptance – Rejection technique – Composition & Convolution Method.

Module III

Analysis Of Simulation Data: Input Modeling – Data collection – Assessing sample independence – Hypothesizing distribution family with data – Parameter Estimation – Goodness-of-fit tests – Selecting input models in absence of data – Output analysis for a Single system – Terminating Simulations – Steady state simulations.

Verification and validation: Model Building – Verification of Simulation Models – Calibration and Validation of Models – Validation of Model Assumptions – Validating Input – Output Transformations.

Module IV

Simulation of Computer Systems and Case Studies:Simulation Tools – Model Input – High level computer system simulation – CPU – Memory Simulation – Comparison of systems via simulation – simulation Programming techniques – Development of Simulation models.

References:

1. Jerry Banks and John Carson, "Discrete Event System Simulation"' Fourth Edition, PHI, 2005
2. Geoffrey Gordon, "System Simulation", Second Edition, PHI, 2006, ISBN'978-81-203-01405
3. Frank L.Severance, "System Modeling and Simulation", Wiely, 2001.
4. Averill M. Law and W.David Kelton, "Simulation Modeling and Analysis, Third Edition, McGraw Hill, 2006.
5. Jerry Banks, "Handbook of Simulation: Principles, Methodology, Advances, Applications and Practice"' Wiley, 1998.
6. Jerry Banks, J.S.Carson, Barry L Nelson, David M.N, P.Shahabudeen, "Discrete-Event System Stimulation", Pearson 4th Edition.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1606 E3 SECURITY IN COMPUTING

Module I

Introduction- Security problem in computing, Security in Networks. Elementary Cryptography- Introduction- Substitution and Transposition Ciphers. Review of Number Theory-Modular arithmetic.

Module II

Encryption Algorithms-Symmetric Key encryption- DES, AES.

Module III

Public Key encryption. RSA Crypto System. Primality testing-
Miller-Rabin Algorithm. Diffie- Hellman Cryptosystem, Hash Algorithms

Module IV

Authentication protocols, Digital Signature, Secure e-mail, SSL, IP Security. System security –Intruders, Malicious Software , Firewalls.

References:

1. Stallings W. "Cryptography and Network Security Principles and Practice", 4th edition, Pearson
2. W. Mao " Modern cryptography : Theory and Practice" , HP Professional Series, 2011
3. Menezes , P. Van Oorschot , S. Vanstone , "Handbook of Applied Cryptography, CRC Press 2001.
4. Calabrese "Information Security Intelligence : Cryptographic Principles & Applications." Thomson Learning.
5. Atul Kahate, "Cryptography and network security" 2nd Edition, McGraw Hill.
6. Behrouz A Forouzan, Debdeep Mukhopadhyay," Cryptography and network security", 2nd edition, McGraw Hill.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/IT 1606 E4 EMBEDDED SYSTEMS

Module I

Overview of Embedded System:- Embedded System, Categories of Embedded System, Requirements of Embedded Systems. Embedded system design process-requirements-specification-architecture design-Designing hardware and software components-System integration. Instruction sets-Computer architecture taxonomy-ARM processor: architecture and memory organization-Data operations-Flow control-TI C55x DSP: Processor and memory organization- Addressing modes-data operations.

Module II

CPUs: Programming input and output-Supervisor mode,Exceptions and Traps-Coprocessors-Memory system mechanism-CPU performance-CPU power consumption.

Program Design and analysis: Components of embedded program-Model of programs-Assembly ,linking and loading-Basic compilation techniques-Program optimization-Program level performance analysis-Software performance optimization-Program level energy and power analysis-analysis and optimization of program size- program validation and testing

Module III

Introduction to Real Time Operating System : Task and task states,task and data, semaphore and shared data,message queues, mail boxes,pipes,time functions,events,Memory management,interrupt routines in RTOS environment. Preemptive real time operating systems-priority based scheduling-Rate monotonic scheduling-Earliest deadline first scheduling-Interprocess communication mechanism-Evaluating OS performance-Power management and optimization of processes.

Module IV

Real Time & Database Applications: - Real-Time Embedded Software Development, Sending a Message over a Serial Link. Distributed embedded architectures-I2C bus-Field bus-Internet enabled systems-Vehicles as networks-Sensor networks.

References:

1. Wayne Wolf, " Computer as Components-Principles of Embedded Computing System Design", Elsevier,Morgan Kaufman,2008 ISBN-13: 978-155860541
2. K.V.K.K Prasad,Programming for Embedded Systems,Dreamtech Software Team, Wiley Dreamtech,2005 ISBN-13:978-8177224610
3. Raj Kamal, "Embedded Systems: Architecture, Programming and Design" McGraw-Hill Education (India); 2nd Edition edition (March 9, 2009) ISBN-13: 978-0070151253
4. Steve Heath "Embedded Systems Design" Newnes (2002) ISBN-13: 978-0750655460
5. Tammy Noergaard "Embedded Systems Architecture: A Comprehensive Guide for Engineers and Programmers" Newnes (February 24, 2005) ISBN-13: 978-0750677929

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 16L1 SYSTEM PROGRAMMING AND HARDWARE LABORATORY

Module I

1. Study of Linux System calls and INT80h
2. Study of NASM/YASM assembler
3. Study of GNU debugger
4. Study of basic hardware components of PC

Module II

1. 32/64 bit assembly language programming using NASM/YASM
2. Unsigned and signed arithmetics
3. Matrix manipulation
4. String manipulation
5. incorporate C function in assembly programs

Module III

1. File management- create, read, and write operations
2. Process management-create and mange processes
3. Programming to communicate with parallel and serial and LAN interfaces

Module IV

1. Basic Floating point arithmetic
2. Study of INT21h and programming with NASM in Windows Environment

References:

1. Sivarama P. Dandamudi,Guide to Assembly Language Programming in Linux ,Springer, 2005 ISBN:978-0-38-725897-3
2. Randall Hyde,The Art of Assembly Language Programming ,2/e, No starch Press, 2010, ISB :978-1-59-327207-4
3. Jeff Duntemann, Assmbly Language Step-by-Step: Programming with DOS and Linux.2/e, Wiley,2000 ISBN: 978-0-47-137523-4
4. Bigelow, PC Hardware Desk Reference, 2/e,McGraw hill, 2002. ISBN: 978-0-07-222525-9

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CS 16L2 MINI PROJECT

The students are expected to develop an application using a standard DBMS package. They have to do a proper system study and prepare SRS and design documents.

Each batch comprising of 3 to5 students shall design. Each student shall submit a project report at the end of the semester. The project report should contain the design and engineering documentation including the Bill of Materials and test results. Product has to be demonstrated for its full design specifications. Innovative design concepts, reliability considerations and aesthetics / ergonomic aspects taken care of in the project shall be given due weight.

Guidelines for evaluation:

i) Attendance and Regularity	10
ii) Work knowledge and Involvement	30
iii) End-Semester presentation & Oral examination	20
iv) Level of completion and demonstration of functionality/specifications	25
v) Project Report	15

Total 100 marks

Note: External projects and R&D projects need not be encouraged at this level. Points (i) & (ii) to be evaluated by the project guide & co-ordinator and the rest by the final evaluation team comprising of 3 teachers including the project guide.

CS/EB/EC/EE/EI/IT 1701 INDUSTRIAL ORGANIZATION AND MANAGEMENT

Module I

Organisation: Introduction, definition of organization, system approach applied to organization, necessity of organization, elements of organization, process of organization, principles of organization, formal and informal organization, organization structure, types of organization structure .

Forms of business organization: Concept of ownership organization, types of ownership. Individual ownership, partnership, joint stock Company, private and public limited company, co-operative organizations, state ownership, public corporation

Module II

Basic concept of management: Introduction, definitions of management, characteristics of management, levels of management, management skills

Management theory: Scientific management, contribution of Gilbreth. Gantt, Neo-classical theory, modern management theories

Functions of management: Planning, forecasting, organizing, staffing, directing, motivating, controlling, co-coordinating, communicating, decision making.

Module III

Personnel management: Introduction, definition, objectives, characteristics, functions, principles and organization of personnel management

Markets and marketing: Introduction, the market, marketing information, market segmentation, consumer and indusial markets, pricing, sales, physical distribution, consumer behaviour and advertisement.

Financial management: the basics , financial accounts, inflation, profitability, budgets and controls, cost accounting, valuation of stock, allocation of overheads, standard costing ,marginal costing

Module IV

Productivity and production: Measurement of productivity, productivity index productivity improvement procedure

Materials management and purchasing: Objectives, functions, importance of materials management. Stores and storekeeping

Inventory control: Classification, functions, inventory models, inventory costs, EOQ, Materials requirement planning

References:

1. Fraidoon Mazda, Engineering Management-, Addison -Wesley
2. Koontz and O'Donnell, Essentials of Management, Mc Graw Hill
3. Kotlar P, Marketing Management, Prentice Hall India
4. Prsanna Chandra , Finance Management,TMH.5th ed.,
5. Monks J.G Operations Management ,MGH

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1702 ARTIFICIAL INTELLIGENCE

Module I

Software agents – agent characteristics, agent topology, agent oriented programming, Java implementation of intelligent agents

Module II

Introduction - Problem spaces and search - Production systems - Characteristics. Heuristic search techniques - Generate and Test - Hill climbing -Best fit. Graph search - A* algorithm. Problem reduction - constraint satisfaction - Means and End analysis. Game playing - Minimax - Alpha-beta cut-off.

Module III

Logic and Deduction. Introduction to symbolic logic - Propositional logic - Well Formed Formula. Predicate Logic - predicates variables and constants - First order logic, Quantifiers. Forward chaining and Unification. Goal trees. Resolution by refutation.

Module IV

Representing Knowledge. Procedural versus Declarative. Reasoning under uncertainty - Nonmonotonic reasoning - Statistical reasoning. Bayesian networks.. Fuzzy Logic . Semantic Nets, Frames, Conceptual Dependency, Scripts, CYC. Natural Language Processing - Transformational grammar, Case grammar - Semantic grammars. Learning: Learning by analysing, by explaining experience, by correcting mistakes, by recording cases

References:

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw-Hill Publishing Company Ltd., New Delhi, Third Edition, ISBN: 13:978-0-07-008770-5, 2010. (Modules 2,3,4)
2. Jeffrey M Bradshaw, "Software Agents", AAAI Press/ The MIT Press(1997) (Module 1), ISBN: 0-262-52234-9
3. Dan W.Patterson, "Introduction to Artificial Intelligence and Expert Systems", Prentice Hall India Ltd., New Delhi, 2009, ISBN: 81-203-0777-1 .
4. Nillson N. J., "Artificial Intelligence: A new Synthesis", Elsevier, New Delhi ISBN-10: 1558604677 , ISBN-13: 978-1558604674 ,1998 , Edition: 1
5. Rajendra Akerkar, Introduction to Artificial Intelligence, PHI Learning Pvt. Ltd. , 2005, ISBN: 81-203-2864-7.
6. Akshar Bharati, Vineet Chaitanya, Rajeev Sangal, "Natural Language Processing: A Paninian Perspective", Prentice Hall India Ltd., New Delhi, 1996, ISBN 10: 8120309219

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1703 ADVANCED COMPUTER NETWORKS

Module I

Network Technologies : -WAN and LAN - Ethernet Technology: Fast And Gigabit Ethernet -10/100/1000 Ethernet - Properties of an Ethernet - interoperability & collision domains – Ethernet Hardware Addresses - Ethernet Frame Format - Extending An Ethernet With Bridges - Switched Ethernet -VLAN. Classful Internet Addresses: The Original Classful Addressing Scheme Dotted Decimal Notation - Subnet And Classless Extensions - IP Multicast Addresses .ARP: Resolution Through Direct Mapping - Resolution Through Dynamic Binding - ARP Protocol Format- ARP Implementation . RARP.

Module II

Internet Routing: Routing Between Peers (BGP)-Routing Within An Autonomous System (RIP, OSPF).Internet Multicasting : Ethernet Multicast- IP Multicast- IGMP-DVMRP-PIM. Understanding Router Components: Ports-Queueing- Scheduling-shaping-policing-marking. QoS in IP networkk. IPv6: Frame formats-Comparison with IPv4. Introduction to ICMP,DHCP and NAT. Network Management: SNMP and RMON models

Module III

Wireless transmission: Frequencies for radio transmission-Signals-Antennas-Signal propagation-Multiplexing-Modulation-Spread spectrum-Cellular systems. Medium access control: SDMA-FDMA-TDMA-CDMA-Comparison of S/T/F/CDMA.

Module IV

Telecommunications systems. GSM,:-System Architecture, Radio Interface, Protocols, Addressing-Call management and Handover. GGPRS and UMTS networks. Wireless LAN(WiFi): Infrared vs radio transmission-Infrastructure and ad-hoc network-IEEE 802.11a,b,g, 802.15 and 802.16 protocol standards – Bluetooth - Principle of WiMax . Mobile IP.

References:

1. Douglas E.Comer, Internetworking With TCP/IP Volume 1: Principles Protocols, and Architecture, 5/e ,Prentice Hall,2006. (Module I and II), ISBN:978-8-12-031053-7
2. Schiller, Mobile Communication, 2/e , Addison Wesley, 2005 (Module III and IV) ISBN:978-0321123817
3. Youlu Zheng and Shakil Akhtar, Networks for Computer Scientist and Engineers, Oxford University Press,2006
4. James.F.Kurose & Keith W.Ross , Computer Networking –A Top Down approach featuring Internet, 3/e, Pearson Education,2005.
5. Douglas E.Comer, Computer Network and Internets, 2/e, Person education ,2003.
6. Andrew S.Tanenbaum, Computer Networks ,$/e Edition,Pearson education,2003
7. William Stallings, Wireless Communicatuion Networks, 2/e, Pearson Education,2003.
8. Nathan J. Muller, Bluetooth Demystified, McGraw-Hill Professional Publishing,2000

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1704 ANALYSIS AND DESIGN OF ALGORITHMS

Module I

Analyzing Algorithms and problems. Classifying functions by their asymptotic growth rate. Recursive procedures. Recurrence equations - Substitution Method, Changing variables, Recursion Tree, Master Theorem. Design Techniques- Divide and Conquer, Dynamic Programming, Greedy, Backtracking

Module II

Analysis of searching and sorting. Insertion sort, Quick sort, Merge sort and Heap sort. Binomial Heaps and Fibonacci Heaps, Lower bounds for sorting by comparison of keys. Comparison of sorting algorithms. Amortized Time Analysis. Red-Black Trees – Insertion & Deletion.

Module III

Graphs and graph traversals. Strongly connected components of a Directed graph. Biconnected components of an undirected graph.

Transitive closure of a Binary relation. Warshalls algorithm for Transitive closure. All pair shortest path in graphs. Dynamic programming. Constructing optimal binary search trees.

Module IV

Complexity Theory - Introduction. P and NP. NP-Complete problems. Approximation algorithms. Bin packing, Graph coloring. Traveling salesperson Problem.

References:

1. Allen Van Gelder, Sara Baase, "Computer Algorithms - Introduction to Design and Analysis", 3rd Edition, Pearson ISBN 978-81-317-0244-4
2. T. H. Cormen, C. E. Lieserson, R. L. Rivest, Introduction to Algorithms, Prentice Hall India, 3/e ISBN 978-81-203-4007-7
3. Anany Levitin, "Introduction to the design and analysis of algorithms", Pearson Education,secondedition,ISBN978-81-317-1837-7
4. A.V.Aho, J.E.Hopcroft and J.D. Ullman, "The Design and Analysis of Computer Algorithms", Addison Wesley Publishing House, Reading, MA, ISBN 978-81-317- 0205-
5. E Horowitz and S Sahni, "Fundamentals of Computer Algorithms", Computer Science Press, Rockville
6. Jeffrey H.Kingston, "Algorithms and Data Structures - Design, Correctness and Analysis",AddisonWesley,Singapore,1990
7. Knuth, "Art of Computer Programming Vol II, Sorting and Searching,", Prentice Hall

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1705 E1 SOFTWARE PROJECT MANAGEMENT

Module I

Introduction And Software Project Planning: Fundamentals of software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of Project plan, Structure of a Software Project Management Plan, software project estimation, Estimation methods, Estimation models, Decision process.

Module II

Project Organization And Scheduling: Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts, Milestone charts, Gantt Charts.

Module III

Monitoring And Control: Creating Framework – Collecting the Data – Visualizing Progress – Cost Monitoring – Earned Value – Priortizing Monitoring – Getting Project Back To Target – Change control – Managing contracts – Introduction – Types of Contract – Stages in Contract Placement – Typical Terms of a Contract – Contract Management – Acceptance.

Module IV

Managing People and Organizing Teams: Introduction – Understanding Behavior – Organizational Behaviour: A Background – Selecting the Right Person For The Job – Instruction in the Best Methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working in Groups – Becoming a Team – Decision Making – Leadership – Organizational Structures – Stress – Health and Safety – Case Studies.

References:

1. Jalote, "software Project Management in Practice", First edition, Pearson Education, ISBN: 978-7-30-210682-1.
2. Bob Hughes, Mike cotterell, "Software Project Management", Third Edition, Tata McGraw Hill, ISBN: 978-0-07-070653-8.
3. Ramesh, Gopalaswamy, "Managing Global Projects", First edition, Tata McGraw Hill, ISBN: 978-0-07-059897-3.
4. Royce, "Software Project Management", First edition, Pearson Education, ISBN: 978-0-2-0130958-4.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1705 E2 INFORMATION RETRIEVAL

Module I

Introduction – Information versus Data Retrieval. Modeling of Information retrieval. Formal characterization of Information retrieval – Alternate set theoretic models. Alternate algebraic models. Alternate probabilistic models. Structured text retrieval models. Models for Browsing. Retrieval Evaluation.

Module II

Query languages. Text Operations- Document pre processing. Text compression. Indexing and searching. Inverted files. Suffix trees and suffix arrays. Boolean queries. Sequential searching. Pattern matching. Structural queries. User interface and visualization.

Module III

Parallel and Distributed Information Retrieval. Implementation of inverted files, suffix arrays and signature files in MIMD architecture. Implementation of Inverted files, suffix arrays and signature files in SIMD architecture.

Module IV

Searhing the web – modeling the web . Search engines –architecture, user interfaces, ranking, crawling, indices. Web Directories-Metadata- Metasearchers-Web as graph-Hubs and Authorities- Case study - google search engine.

References:

1. Ricardo Baexa-Yates and Berthier Ribeiro-Neto. Modern Information Retrieval. Addison Wesley Longman, 1999.ISBN: 0-201-39829-X.
2. Sergey Brin and Lawrence page. The anatomy of large scale hyper textual(Web) search engine. Computer Networks and ISDN systems, Vol 30,No 1-7 .
3. J Kleinberg, et. Al. The Web as a graph: Measurements, models and methods. Lecture notes in computer science , Springer Verlag, 1999.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1705 E3 GRID COMPUTING

Module I

Concepts and architecture: Introduction – Parallel and Distributed Computing – Cluster Computing – Grid Computing – Anatomy and Physiology of Grid – Review of Web Services – OGSA – WSRF.

Module II

Grid Monitoring: Grid Monitoring Architecture (GMA) – An Overview of Grid Monitoring Systems – Grid CE – JAMM – MDS – Network Weather Service-R-GMA-Other Monitoring Systems – Gangila and GridMon

Module III

Grid security and Resource Management: Grid Security-A Brief Security Primer –PKI-X509 Certificates – Grid Security – Grid Scheduling and Resource Management – Scheduling Paradigms – Working Principles of Scheduling – A Review of Condor, SGE, PBS and LSF – Grid Scheduling with QoS.

Module IV

Data Management and Grid Portals: Data Management – Categories and Origins of Structured Data – Data Management Challenges – Architectural Approaches – Collective Data Management Services – Federation Services – Grid Portals – First – Generation Grid Portals – Second – Generation Grid Portals.
Grid Middleware: List of globally available Middlewares – Case Studies -Recent version of Globus Toolkit and GLite – Architecture, Components and Features.

References:

1. Maozhen Li, Mark Baker, The Grid Core Technologies, John Wiley & Sons, 2005.
2. Ian Foster & Carl Kesselman, "The Grid 2 – Blueprint for a New Computing Infrascture", 2nd edition, Morgan Kaufma
3. Joshy Joseph &Craig Fellenstein, "Grid Computing", Pearson Education 2004,ISBN:978-81-317-0885-9.
4. Fran Berman, Geoffrey Fox, Anthony J.G.Hey, "Grid Computing: making the Global Infrastucture a reality", John Wiley and sons, 2003.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/IT 1705 E4 NEURAL NETWORKS

Module I

Introduction to neural networks. Artificial neural networks. Biological neural networks- Comparison , Basic building blocks of ANN. Activation functions. McCulloch-Pitts Neuron Model, Hebb net. Learning Rules- Hebbian Learning Rules, Perceptron, Delta, Competitive, Boltzmann. Perceptron networks- single layer, multilayer –algorithm.

Module II

Feedback Networks, Discrete Hopfield nets, Continuous Hopfield nets. Feed Forward Networks: Back Propagation Networks, Learning Rule, Architecture, training algorithm. Counter Propagation Network: Full CPN, Forward only CPN, architecture, training phases.

Module III

Adaptive Resonance Theory, architecture, learning in ART, Self Organizing feature maps: Kohonen SOM, Learning Vector Quantization, Max net, Mexican Hat, Hamming net. Associative memory networks Algorithms for pattern association Hetero associative networks, Auto associative memory networks Bidirectional associative memory networks Energy Function.

Module IV

Special networks: Probabilistic neural networks, Cognitron, Simulated Annealing, Boltzmann machine, Cauchy machine, Support Vector Machine Classifiers. Application of Neural networks In Image Processing and classification. Introduction to Fuzzy systems, Neuro fuzzy sytems.

References:

1. Dr. S N Sivanandam: "Introduction to neural networks using "MATLAB 6.0", TataMcGrawHill New Delhi.,2012 ISBN 978-0-07-059112-7
2. Laurene Fausett: "Fundamentals of neural networks", Prentice Hall, New Jersey, 2007. ISBN 81-317-0053-4
3. James A. Freeman, David M. Skapure: Neural Networks Algorithms, Applications and Programming Techniques, Addison-Wesley, 2003 ISBN 81-7808-108-3.
4. Kevin Gruney: "An Introduction to neural networks", CRC Press,1997.
5. D. L.Hudson & M. E. Cohen: "Neural Networks and Artificial Intelligence in Biomedical Engg.", Prentice Hall Of India, New Delhi.,1999
6. James A. Anderson, "An Introduction to Neural Networks", Prentice Hall of India,1995.
7. Simon Haykin: "Neural Networks", Pearson Education1 998

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 17L1 LANGUAGE PROCESSORS LABORATORY

Students are expected to do the following exercises:

- Creation of Single Pass – Two Pass assembler – Macro processor.
- Generation of Lexical Analyzer using tools such as Lex
- Generation of Parser using tools such as YACC.
- Generation of LL(1) Parser
- Generation of intermediate code
- Creation of type checker
- Developing a compiler for a subset of a programming language.

References:

1. Doug Brown, John Levine, Tony Mason, Lex & yacc , second edition, O'Reilly Media, 1992, ISBN-10: 1565920007 | ISBN-13: 978-1565920002
2. Alfred Vaho, Ravi Sethi, jeoffrey D Ulman, Compilers principles, techniques and tools, 1986. ISBN 0-32 1-48681- 1

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CS 17L2 NETWORKS AND OPERATING SYSTEMS LABORATORY

1. Study of system level calls of a suitable multitasking operating system. Exercises involving the system calls. (E.g. fork(), exec(), create(), etc. in UNIX/LINUX
2. Inter process communication. Shared memory, messages, Semaphores and monitors. Implementation of typical problems(E.g. Bounded buffer, Dining Philosophers. etc.)
3. Study of Communication protocols. TCP/IP or a suitable protocol. Client server programming. Distributed algorithms. performance modelling of networks.
4. Study of Linux Shell programming .
5. Study of Linux Internals
6. Setting of a LINUX LAN

References:

1. Maurice J Bach, "Design of UNIX Operating System", Prentice Hall 2008 ISBN 81-203-0516-7
2. Unix Network Programming IPC, Vol.2 Second Edition 2003, W. Richard Stevens ISBN 81-203-2062-X
3. Unix Network Programming , Networking API's, Vol.1 2008, W. Richard Stevens ISBN 81-203-2061-1

Note : 50 % marks is earmarked for continuous evaluation, and 50% marks for end semester examination to be conducted by two examiners. A candidate shall secure a minimum of 50 % marks in the aggregate and 50 % minimum in the end semester examination for a pass.

CS 17L3 PROJECT DESIGN

The project work shall commence in the seventh semester shall be completed by the end of eighth semester. Students are expected to identify a suitable project and complete the analysis and design phases by the end of seventh semester. For those students who are doing real life projects in the industry should also have both an external guide in the industry and an internal guide in the department. The internal guides are responsible for the continuous evaluation.

Each batch comprising of 3 to 5 students shall identify a project related to the curriculum of study. At the end of the semester, each student shall submit a project synopsis comprising of the following.

- Application and feasibility of the project
- Complete and detailed design specifications.
- Block level design documentation
- Detailed design documentation including algorithms/circuits
- Bill of materials in standard format and cost model, if applicable
- Project implementation action plan using standard presentation tools

Guidelines for evaluation:

i) Attendance and Regularity	10
ii) Quality and adequacy of design documentation	10
iii) Concepts and completeness of design	10
iv) Theoretical knowledge and individual involvement	10
v) Quality and contents of project synopsis	10
	Total 50 Marks

Note: Points (i)-(iii) to be evaluated by the respective project guides and project coordinator based on continuous evaluation. (iv)-(v) to be evaluated by the final evaluation team comprising of 3 internal examiners including the project guide.

CS 17L4 SEMINAR

Students shall individually prepare and submit a seminar report on a topic of current relevance related to the field of Computers either hardware or software. The reference shall include standard journals, conference proceedings, reputed magazines and textbooks, technical reports and URLs. The references shall be incorporated in the report following IEEE standards reflecting the state-of-the-art in the topic selected. Each student shall present a seminar for about 30 minutes duration on the selected topic. The report and presentation shall be evaluated by a team of internal experts comprising of 3 teachers based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the seminar report.

CS 1801 ADVANCED ARCHITECTURE AND PARALLEL PROCESSING

Module I

Parallel Computer methods: The state of computing -Multiprocessor and multi computers-Multi vector and SIMD computers-PRAM and VLSI models-Architectural development tracks.

Program and Network properties: Condition of parallelism-Program partitioning and scheduling-Program flow mechanism-System interconnect architecture.

Principles of Scalable Performance: Performance matricides and measures-Parallel processing applications-Speedup performance laws-Scalability analysis and approaches

Module II

Processors and Memory Hierarchy: Advanced processor technology-Super scalar and vector processors-Memory hierarchy technology-Virtual memory technology.

Bus,Cache and Shared Memory: Bus System-Cache memory organizations-Shared memory organization-Sequential and weak consistency models.

Module III

Pipelining and super scalar techniques: Linear pipeline processors-Non linear pipeline processors-Instruction pipeline design-Arithmetic pipeline design.

Parallel and scalable architectures:Multiprocessor system interconnect-Cache coherence and synchronization mechanism-Three generations of multi computers-Message passing mechanism-Vector processing principles-SIMD computer organization-Principles of multi threading-Fine grain multi computers

Module IV

Parallel programming: Parallel programming models-Parallel language and compilers-Dependency analysis-Code optimization and scheduling-loop parallelization- MPI and PVM libraries.

Instruction level parallelism: Design issue-Models of typical processor-compiler directed instruction level parallelism-Operand forwarding-Tomusulo's algorithm-Branch prediction-Thread level parallelism.

References:

1. Kai Hwang, Naresh Jotwani , "Advanced Computer Architecture: Parallelism, Scalability, Programmability", 2/e, McGRawHill Education, 2011 ISBN: 978-0-07-070210-3, 0-07-070210-1
2. Dezmo Sima,Terence Fountain,Peter Karsuk "Advanced Computer Architecture-A Design Space approach", Pearson Education, 2012. ISBN: 978-81-317-0208-6
3. Sajjan G.Shiva, "Advanced Computer Architecture", CRCTaylor & Francis ,2006 .ISBN: 0-8493-3758--5
4. David E.Culler, Jaswinder Pal Singh, Anoop Guptha,"Parallel Computer Architecture", Elsevier, 2000. ISBN: 81-8147-189-X , 1-5586-0343-3
5. V.Rajaraman, C. Siva Ram Murthy, "Parallel Computers Architecture and Programming", PHI, New Delhi, 2000 .ISBN: 81-203-1621-5

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1802 OBJECT ORIENTD MODELLING AND DESIGN

Module I

Object Oriented Programming and Design Principles: Object Oriented Concepts – Nature and purpose of models – Object Modeling – Dynamic Modeling – Functional Modeling
System Design- Object Design

Module II

UML Structural Modeling: Basics of UML based object oriented analysis and design
Classes – Relationships – Interfaces – Roles – Class diagrams – Advanced classes
and relationship – Packages – Instances – Object diagrams

Module III

UML Behavioral Modeling: Interactions – Use cases – Interaction diagrams – Use case diagrams – Activity diagrams – Events – Signals – State Machines – Processes – Threads – State chart diagrams

Module IV

UML Architectural Modeling: Component diagrams – Deployment diagrams – Collaborations – Unified Processes Introduction to Software Architecture:
Design frameworks – Design pattern – Describing the architecture in Architecture
description language (ADL)

References:

1. Object Modelling and Design – James Rambaugh et. al., Second edition, PHI,ISBN:978-8-13-171106-4
2. The Unified Modeling Language User Guide – Grady Booch, James Rambaugh,Ivar Jacobson .A.W, Second edition, Pearson Education , ISBN: 978-8-13-171582-6
3. The Unified Software Development Process – Ivan Jacobson, Grady Booch, James Rambaugh A.W, First edition, Pearson Education , ISBN: 978-8-17-758315-1
4. Object Oriented Software Engineering using UML patterns and Java, Bruegge Second edition, Pearson Education, ISBN: 978-8-17-758768-5
5. Rational Unified Process, Kruchten, Third edition, Pearson Education, ISBN: 978-8-17-758693-0
6. Object oriented design using java-Dales Skrien, First edition, Tata McGrahill publications, ISBN: 978-0-07-297416-4
7. Object oriented Systems Development using the unified modeling language-Ali Bahrami, First edition, Tata McGrawhill publications, ISBN: 978-0-07-026512-7

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS/IT 1803 DISTRIBUTED COMPUTING

Module I

Characterization of Distributed systems – Introduction - Examples of Distributed Systems – Challenges - System Models – Architectural models - Fundamental Models – Interprocess communication - The API for the Internet protocols - External Data representation and Marshalling - Client Server Communication - Group communication. Interprocess communication in UNIX. Distributed Objects and Remote Invocation – Communication between distributed objects - Remote Procedure Call - Events and Notifications - Case Study - Java RMI.

Module II

Operating System Support-The Operating system layer – Protection- Processes and Threads-Operating System architecture.

Distributed file Systems-Introduction-File Service architecture– Case study Sun NFS. Name services and Domain Name System – Directory Services.

Module III

Time and co-ordination. Synchronizing physical clocks -logical time and logical clocks. Distributed co-ordination –distributed mutual exclusion – elections. Replication – basic architectural model –consistency and request ordering.

Module IV

Distributed DBMS Architecture- Distributed Database Design –Query Decomposition and Data Localization -Distributed transactions – concurrency control in distributed transactions– distributed deadlocks – transaction recovery.

References:

1. George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems – Concepts and Design", Fourth Edition, Pearson Education, 2011. ISBN 978-81-317-1840-7.
2. Sunita Mahajan, Seema Shah, "Distributed Computing", Oxford University Press, 2010. ISBN: 0-19-806186-2.
3. Andrew S Tanenbaum, "Distributed Operating Systems", Pearson Education, 2011. ISBN 978-81-7758-179-9.
4. Randy Chow, Theodore Johnson, "Distributed Operating Systems and Algorithm Analysis", Pearson Education, 2011. ISBN 978-81-317-2859-8.
5. M.Tamer Ozsu, Patrick Valduriez, "Principles of Distributed Database Systems", Second Edition, Pearson Education.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1804 E1 OPERATIONS RESEARCH

Module I

Linear Algebra: Review of the properties of matrices and matrix operations, partitioning of matrices, vectors and Euclidean spaces, unit vectors, sum vectors, linear dependence, bases, spanning set, rank, product form of inverse, simultaneous equations, basic solutions, point sets, lines and hyper planes, convex sets, extreme points, fundamental theorem of linear programming.

Module II

Linear Programming: Fundamentals Theorems of Linear programming, Mathematical formulation of the problem, Assumption of Linear programming, graphical Method.
Simplex Method – Slack & surplus variables, basic feasible solution, reduction of a feasible solution to basic feasible solution, artificial variables, optimality conditions. Charnes 'M'Method, two phase method.

Module III

Transportation Problems: Definition of a transportation model, North-west Corner Rule, Least Cost or Matrix Minima Method, Vogel's approximation method, Degeneracy in Transportation problem.
Assignment Problems
Theorems of Assignment problem, Zero assignments, Unbalanced problems.
Comparison with Transportation Models.

Module IV

Game Theory: Von Neuman's theorem, saddle points, pure and mixed strategies, formulation of primal and dual LP problems for mixed strategies, dominance, graphical solutions. Queueing Theory : Basic structures of queueing models, exponential and poisson distribution, Kendall's Notation, Queueing models – M/M/1 and M/M/K.
Simulation : Definition, Simulation Models – Monte-Carlo Simulation, Application of Simulation, Advantages and limitations of Simulation.

References:

1. Operations Research, Goel and Mittal, Pragti Prakasan, Meerut
2. Operations Research, Kanti Swarup, Gupta and Manmohan, Sultan Chand and Sons Publishers, New Delhi.
3. Operations Research , S Kalavathy , Vikas Publishing House
4. Introduction to operational research , C. R. Kothari Vikas Publishing House
5. Resource Management , N.G. Nair

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1804 E2 DATA MINING

Module I

Introduction to Data Mining: A definition for Data Mining-Applications of data mining-supervised vs. unsupervised -learning–data mining strategies-unsupervised clustering using nearest neighbor algorithm-data mining stages-data pre-processing-Introduction to multidimensional data bases-data warehousing-OLAP

Module II

Basic Data Mining techniques: Decision tree building algorithm using information gain concepts –multilayer perceptions for regression and classification- Association rule learning – genetic learning – choosing the best model for a problem-analysis using confusion matrix-cross validation-classification of major clustering methods. Partition algorithms -Hierarchical methods, Density based methods, Grid based methods

Module III

Statistical techniques in data mining: Chi-square analysis-regression techniques-principal component analysis-Naïve Bayes classifier-Support Vector Machines-Lazy classifiers-Rough set concepts- Time series analysis - Case studies in data mining using these classifiers

Module IV

Advanced data mining techniques: Text mining- Web mining –spatial mining-temporal mining-Ensemble techniques-case studies using statistical packages-case studies using WEKA software package

References:

1. Data mining-G.K Gupta, First edition, PHI publications, ISBN:81-203-3053-6.
2. Data mining-Practical machine learning tools and techniques- Ian.H.Witten, E.Frank, M.A Hall, Third edition, Elsevier Publications, ISBN: 978-93-80501-86-4.
3. Data mining –Richard Royger, First edition, Pearson Education, ISBN 81-297-1089-7.
4. Data mining methods-Rajan Chattamvelil, First edition, Narosa publishers, ISBN: 978-81-7319-967-7.
5. Data Mining:Concepts and Techniques – Jiawei Han and Micheline Kamber, Third edition , Morgan Kaufmann Publishers, ISBN:978-93-80931-91-3.
6. Data Mining: Introductory and Advanced Topics – Margaret H. Dunham and S.Sridhar, First edition, Pearson Education, ISBN: 978-81-77587-85-2.
7. Insight into data mining-theory and practice-K.P.Soman, Shyam Divakar, V. Ajay- First edition, PHI publications-ISBN: 978-81-203-2897-6.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 1804 E3 MOBILE COMPUTING

Module I

Mobile Computing Architecture ,Mobile computing through telephony, Emerging Technologies, Bluetooth, Radio Frequency Identification (Rfid),Wireless Broadband (WiMAX), Mobile IP, Internet Protocol Version 6(IPv6), Java Card

Module II

Global System for Mobile Communications (GSM), Short Message Service (SMS),Mobile computing over SMS,Value added services through SMS,Accessing the SMS Bearer, General Packet Radio Service (GPRS),GPRS and packet data network,GPRS network architecture,GPRS Network operationsApplications and limitations, Wireless Application Protocol (WAP),MMS,GPRS applications

Module III

CDMA and 3G,Spread Spectrum Tecnhology, CDMA versus GSM, wireless data, Third generation network,Application on 3G, Wireless LAN, advantages in Wireless LAN, Architecture of Wireless LAN, Mobility in Wireless LAN, Deploying Wireless LAN, Mobile Ad hoc Networks and Sensor Network, Wireless LAN security, HiperLAN, WIFI versus 3G

Module IV

Client Programming, J2ME, Connected device configuration(CDC), Connected limited device configuration(CLDC),Programming for CLDC, Voice Over Internet Protocol and Convergence, H.323 framework for VoIP, Session Initiation Protocol(SIP), Comparison between H.323 and SIP, Real time protocol, Convergence Technologies, Call Routing, IP Multimedia Subsystems , Architecture of IMS Networks, Protocols used in IMS, Call Flow, IMS charging, Security Issues in Mobile Computing

References:

1. Asoke Talukder,Roopa Yavagal, Haswsan Ahammed, Mobile Computing Technology, Applications and Service Creation,McGrawhill,2006, 2/e, ISBN: -13:978-007-014457-6.
2. Amjad Umar, Mobile Computing and Wireless Communications,NGE Solutions,2004
3. Reza Behravanfar, Phillip Lindsay, Reza B'Far, Mobile Computing Principles: designing and developing mobile applications with UML and XML,Cambridge University Press,2006.
4. Raj Kamal, Mobile Computing, Oxford University Press, 2007
5. U. HansMann, L Merk, M.S. Nicklous and T. Stober, Principles of Mobile Computing, 2/e, Spniyer, 2003
6. Schiller J, Mobile Communications, 2/e-Addison Weslay,2003.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS1804 E4 AGENT BASED INTELLIGENT SYSTEMS

Module I

Introduction: Definitions – Foundations – History – Intelligent Agents – Problem Solving –Searching – Heuristics – Constraint satisfaction Problems – Game Playing.
knowledge representation and reasoning: Logical agents – First order logic – First Order Inference – Unification – Chaining –Resolution Strategies – Knowledge Representation – Objects – Actions – Events.

Module II

Planning Agents: Planning Problem – State Space Search – Partial Order Planning _Graphs – No deterministic Domains – Conditional Planning – continuous Planning – Multi Agent Planning.

Module III

Agents And Uncertainty: Acting under uncertainty – Probability Notation – Bayes Rule and use – Bayesian Networks – Other approaches – Time and Uncertainty – Temporal Models – Utility Theory – Decision Network – Complex Decisions.

Module IV

Higher Level Agents: Knowledge in Learning – Relevance information –Statistical Learning Methods – Reinforcement Learning – Communication – Formal Grammar – Augmented Grammars- Future of AI.

References:

1. Stuart Russell and Peter Norvig. Artificial Intelligence – A Modern Approach. 2nd Edition, Prentice Hall, 2002. ISBN: 978-81-7758-367-0
2. Michael Wooldridge. An Introduction to Multi Agent System. 2nd Edition, John Wiley, 2002 . ISBN: 978-0-470-51946-2.
3. Patrick Henry Winston . Artificial Intelligence. 3rd Edition, AW, 1999. ISBN: 978-81-317-1505-5.
4. Nils.J.Nilsson. Principles of Artificial Intelligence. Narosa Publishing House, 1992. ISBN: 3-540-11340-1.

Type of Questions for University Exam.

Q 1. Eight short answer questions of 5 marks each with two questions from each of the four modules. (8 x5 = 40 marks)

Q 2. to Q.5 : Two questions A & B of 15 marks from each modules with option to answer either A or B.(4 x 15 = 60 marks)

CS 18L1 PROJECT

The project work commencing from the seventh semester shall be completed and the project report shall be submitted by each student by the end of eighth semester. There shall be an internal examination of the project that includes a presentation, demonstration and oral examination of the project work.

Each batch of students shall develop the project designed during the VII semester. The implementation phase shall proceed as follows:

A detailed algorithm level implementation, test data selection, validation, analysis of outputs and necessary trial run shall be done.
Integration of hardware and software, if applicable, shall be carried out.
A detailed project report in the prescribed format shall be submitted at the end of the semester. All test results and relevant design and engineering documentation shall be included in the report.
The work shall be reviewed and evaluated periodically

A committee consisting of the Project Coordinator (appointed by the Head of the Department / Division), project guide and at least one senior faculty member will carry out the assessment based on at least one interim review and a final review just before the submission of the project report.

The final evaluation of the project shall be done by a team of minimum 3 internal examiners including the project guide and shall include the following.

- Presentation of the work
- Oral Examination
- Demonstration of the project against design specifications
- Quality and content of the project report

Guidelines for evaluation:

Regularity and progress of work	60
Work knowledge and Involvement	60
End semester presentation and oral examination	60
Level of completion and demonstration of functionality/specifications	60
Project Report – Presentation style and content	60
	Total 300 marks

Note: Points (i) and (ii) to be evaluated by the respective project guide and the project coordinator based on continuous evaluation. (iii)-(v) to be evaluated by the final evaluation team .

CS 18L2 VIVA-VOCE

Each student is required to appear for a viva-voce examination at the end of the complete course work. The students shall produce the seminar report and project reports duly attested by the institutional authorities, before the examiners. The examination panel shall comprise of Head of the Department / Division or his/her nominee and one senior faculty of the Department/Division and an external expert. The examination panel should be appointed by the University. The examiners shall evaluate the students in terms of their conceptual grasp of the course of study and practical/analysis skills in the field.