

SCHEME OF EXAMINATION FOR B.TECH DEGREE

I Semester Examination (Common to all Branches)

Course No.	Subject	Teaching Schedule				Examination Schedule			Total	Duration of Exam
		L	T	P/D	Total	Theory	Sessional	Practical/ Viva		
HUT-109	Engineering Economics	3	1	-	4	60	40		100	3
	OR									
MET-103	Manufacturing Processes	3	1	-	4	-	-		-	-
HUT-107	Communication Skills In English	2	2	-	4	60	40		100	3
	OR									
ECT-103	Basic Electronics Engineering	2	2/2	-	3	75	25		100	3
ECT-105	Basic Electronics Engineering Practical	-	-	2/2	1	-	10	40	50	3
MAT-105T	Mathematics-I	3	2	-	5	50	50		100	3
PHT-105	Physics-I	3	1	-	4	100	25		125	3
CHT-105	Chemistry-I	3	1	-	4	50	50		100	3
ELT-105	Basic Electrical Engineering	2	2/2	-	3	60	40		100	3
	OR									
COT-101	Computer Engineering	2	2/2	-	3	-	-		-	
CET-103	Engineering Graphics-I	-	-	3	3	75	25		100	4
PHT-107	Physics-1 Practical	-	-	2	2	-	10	40	50	3
CHT-107	Chemistry-I Practical	-	-	2	2	-	60	40	100	3
ELT-107	Basic Electrical Engineering	-	-	3	3	-	60	40	100	3
COT-103	Computer Lab.*	-	-	2/2	1	-	-	-	-	-
MET-105	Workshop Practical-I	-	-	3	3	-	10	40	50	3
		16/16	7/8	12/11	35	575/600	225/240	200/160	1000	

HUT-109 and ECT-103, 105 will be offered to first half of the students strength,

MET-103 and HUT-107 will be offered to second half of the students strength.

Similar procedure for (ELT-105, ELT-107) and (COT-101, COT-103) will be adopted.

*** All Engineering departments will share the teaching as well as exams.**

SCHEME OF EXAMINATION FOR B.TECH DEGREE

II Semester Examination (Common to all Branches)

Course No.	Subject	Teaching Schedule				Examination Schedule			Total	Duration of Exam
		L	T	P/D	Total	Theory	Sessiona I	Practica I/Viva		
MET-103	Manufacturing Processes	3	1	-	4	75	25	-	100	3
	OR									
HUT-109	Engineering Economics	3	1	-	4	-	-	-	-	-
ECT-103	Basic Electronics Engineering	2	2/2	-	3	75	25	-	100	3
ECT-105	Basic Electronics Engineering Practical	-	-	2/2	1	-	10	40	50	3
	OR									
HUT-107	Communication Skills In English	2	2	-	4	100	50	-	150	3
MAT-106T	Mathematics-II	3	1	-	4	50	50	-	100	3
PHT-106	Physics-II	3	2/2	-	4	75	25	-	100	3
CHT-106	Chemistry-II	2	1	-	3	50	50	-	100	3
COT-101	Computer Engineering	2	2/2	-	3	75	25	-	100	3
	OR									
ELT-105	Basic Electrical Engineering	2	2/2	-	3	-	-	-	-	-
MET-104	Engineering Graphics-II	-	-	6	6	100	50	-	150	4
PHT-110	Physics-II Practical	-	-	2/2	1	-	25	25	50	3
CHT-108	Chemistry-II Practical	-	-	2	2	-	60	40	100	3
ELT-107	Basic Electrical Engineering	-	-	2/2	1	-	10	40	50	3
	Practical OR									
COT-103	Computer Lab.*	-	-	2/2	1	-	-	-	-	-
MET-106	Workshop Practical-II	-	-	3	3	-	25	25	50	3
		15/15	7/6	13/14	35	575/550	310/295	115/155	1000	

All Engineering Department will shear the teaching load and examinations.

(Common for all branches)

**ENGINEERING ECONOMICS
HUT-109**

L T
3 1

Theory : 60 Marks
Sectionals: 40 Marks
Total :100 Marks
Time : 3 Hrs

Note for the Paper Setter: The total number of questions to be set will be seven, one question on each unit. The examinees shall attempt any five. All questions shall carry equal marks.

UNIT-I Introduction and Basic Economic Terms:

Nature and significance of Economics; Role of economics in Engineering and Technology, Basic economic terms: utility, savings, investment, equilibrium, micro and macro Economics, globalization, Privatization, liberalization.

UNIT-II Demand Analysis:

Meaning of demand; Law of demand and supply; Elasticity of demand and its measurement, Demand forecasting.

UNIT-III Production:

Factors of production; Law of variable proportions; Production function and least cost combination.

UNIT-IV Cost Analysis

Fixed cost, variable cost, average cost, marginal cost, money cost, real cost opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

UNIT-V Theory of Firm and pricing:

Equilibrium of firm and industry under various market conditions

UNIT-VI Money, Banking and Trade

Money : Meaning and its functions
Banking : functions of a commercial bank; creation of credit.
Central Bank : functions with special reference to Reserve Bank of India.
Trade : principles of International Trade.

UNIT-VII National Income and Planning:

Concepts & measurement of National Income; Meaning and concept of planning.

Suggested Books:

1. Stonier and Hague-A text book of Economic Theory (Longman's London)
2. G. A. Taylor-Managerial and Engineering Economy (V.N. Company)
3. K.K. Dewett-Modern Economic Theory (S. Chand)
4. M. L. Jhingan-Micro Economic Theory (S. Chand)
5. H.L. Ahula-Micro Economic Theory (S. Chand)
6. A.N. Agarwal-Indian Economy-Problems of Development and Planning (Wishwa Prakashan, New Delhi)
7. Ruder Dutt and Sundram- Indian Economy (S. Chand)

B.TECH. Ist/IInd SEMESTER
(COMMON TO ALL BRANCHES)
MET-103 MANUFACTURING PROCESSES

L	T	P/D	Cr
3	1	-	3.5

Casting

Patterns, Materials, Types of allowances, Sand casting: types & properties of molding sand: Various molding methods: Core and its types. Permanent mould castings. CO₂ casting Centrifugal castings. Die castings: Shell molding. Plaster molding. Investment castings. Casting defects & remedies.

(6 Hrs)

Primary Metal Working Processes

Hot and cold forging. Hot cold rolling. Wire drawing and extension processes.

(4 Hrs)

Metal Shearing and Forming

Introduction to shearing, notching. lancing. bending drawing. Stretching. Embossing and coining operations. Process and their types Die and punch operations.

(6 hrs)

Metal Machining Processes

Lathe – parts and accessories. Specifications, Turning tools, various operations on lathe (turning, taper turning thread cutting drilling boring knurling).

(6 hrs)

Welding and Allied Processes

Classification of Welding processes, Resistance welding and its types, thermit welding. Electric arc welding – metal arc welding, carbon arc welding. Submerged arc welding. TIG MIG.Welding. Welding defects and remedies. Soldering and brazing.

(8 hrs)

Special Welding Processes

Electro slag welding. Atomic hydrogen welding. Plasma arc welding. Ultrasonic welding. Laser welding.

(6 hrs)

Plastics Processing

Plastics. Their types and manufacturing properties. Compression molding and Injection molding.

(4 hrs)

Reference Books:

1. Manufacturing Processes by Bageman
1. Manufacturing Materials and Processes by Lindherg
2. Principles of Manufacturing Materials by Comphele
3. Manufacturing Science by Amitabh Ghosh & Kumar Malik
4. Workshop Technology by Hazara, Chowdhary Vol.I & II
5. Workshop Technology Vol. I& II by Raghuwanshi
6. Manufacturing Processes by S K Sharma (I K International Publishing House Pvt. Ltd., Delhi)

**B.Tech Ist/IIInd Semester
(Common to all branches)**

COMMUNICATION SKILLS IN ENGLISH

HUT-107

L T
2 2

Theory : 60 Marks
Sessional : 40 Marks
Total : 100 Marks
Time : 3 Hrs

Marks

UNIT-I	TEXT (for detailed study) <u>English for Science and Technology.</u> Ravi S. Verma. Printwell Publisher, Jaipur. 1987,	(40)
UNIT-II	Word Study 1. Word formation 2. Illustrative use of synonyms	 (5) (5)
UNIT-III	Sentence Structure 1. Common errors 2. Punctuation	 (5) (5)
UNIT-IV	Composition 1. Letters to officials (representations, complaints, job-applications) 2. Precis	 (10) (10)
UNIT-V	Spoken English 1. Transcription of 'received pronunciation' of common English words, including those with '-ed' and '-s' endings, into IPA 2. Primary stress placement on words 3. IPA transcription of weak forms Note: In addition to the questions in the Institute examination, spoken English will be tested also through an oral test for ten marks, as part of the sessionals.	 (10) (5) (5)

NOTES FOR THE PAPER SETTER AND THE STUDENTS

UNIT-I	TWO questions to be set. The first will have FOUR parts of FIVE marks each, related to the specific aspects about the theme, incident, selected ideas, etc. (Note more than ONE question on one chapter). Word limit: 100 per answer.	4x5 (20)
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MARKS

Second question shall have **FOUR** parts of **FIVE** marks each.
The questions shall be broadly related to the topics discussed under the '**grammar and usage**' sub-section of the exercises

	at the end of each chapter.	4x5	(20)
UNIT-II	1. TEN prefixes, suffixes and bases, to be given. The students shall be required to form TEN words, one with each.		(5)
	2. FIVE sentences to be given, with a blank in each. The students shall be required to fill the blanks from a list of FIVE pairs of synonyms given in a jumbled order at the end of the sentences		(5)
UNIT-III	The question on part (1) shall have TEN sentences. The Students shall attempt all the TEN , with minimum changes. ONE sentence shall have only one error. Errors will relate to articles, prepositions, tenses, word-order, adjectival degrees, linkers, number and gender concord.		(5)
	The question on part (2) shall have TEN sentences--each with a different punctuation error. The students shall attempt all the ten sentences		(5)
UNIT-IV	Part (1): TWO letters to be given. The students shall be required to attempt ONE .		(10)
	Part (2): A passage of about 350 words to be given.		(10)
UNIT-V	Part (1): TEN words to be given for transcription into IPA. The students shall be required to attempt all.		(10)
	Part (2): TEN words to be given for marking primary stress on spellings. The students shall attempt all.		(5)
	Part (3): TEN words underlined in different sentences. Students shall transcribe the word forms of all the TEN words.		(5)

(**NOTE:** For both part 1&2 above, the system followed shall be that of A.S. Hornby's **Oxford Advanced Learner's Dictionary of Current English**)

Suggested Books:

1. Bansal, R.K. and J.B. Harrison. 1994. **Spoken English: A Manual of Speech and Phonetics**. Mumbai: Orient Longman
2. Hornby, A.S. **Oxford Advanced Learners' Dictionary of Current English**. New Delhi: Oxford University.
3. Prasad, P. 1999. **Communication Skills for Engineers & Professionals**. Delhi: S.K. Kataria & Sons.
4. Sharma R,C, and Krishan Mohan. 1981. **Business Correspondence & Report Writing**. New Delhi: Tata Mc Graw Hill.
5. Tockoo, M.1 et al. 1977. **Intermediate Grammar, Usage and Composition**. Delhi: Orient Longman.
6. Murphy, Raymond 2001. **Intermediate English Grammar**, New Delhi, Cambridge University Press.
7. Doff, Adrian et al. 1998, **Meanings into Words**. Delhi. Cambridge Univ. Press.

B. Tech I/II Semester
(Common to all branches)
BASIC ELECTRONICS ENGINEERING
(ECT-103)

L	T	P/D
2	2/2	-

Theory :	75 Marks
Sessional:	25 Marks
Time :	3 Hrs

1. Electronics componenets, Signals, Networks:

Passive Components: Resistances, Capacitors and Inductors of various types. Component Specifications, Applications, Response to dc and sinusoidal voltage/current excitations. Signals: DC/AC, voltage/current, periodic/non-periodic signals, average, rms, peak values, different types of signal waveforms, Ideal/non-ideal voltage/current sources, independent/dependent voltage current sources.

Networks:

Network theorems: KCL, KVL, Superposition, Thevehin, Norton, Milliman, Maximum Power Theorems. Loop and node analysis of simple networks. Steady state (including sinusoidal) and transient response of networks.

2. Basic Analog Circuits:

Operational Amplifiers:

Ideal Op-Amp, Practical op-amp, Open loop and closed loop configurations, Application of Op-Amp as amplifier, adder, differentiator and integrator.

3. Basic Digital Electronics:

- Introduction to Boolean Algebra
- Electronic Implementation of Boolean Operations
- Gates-Functional Block Approach
- Storagelements-FlipFloops-A
- A Functional block approach
- Counters : Ripple, Up/down and decade
- Introduction to digital 1C gates (of TTL Type)

Note for the Paper Setter:

There will be at least ONE question from unit 2 and 3 each and at least three questions from the unit 1. A total of eight questions are to be set. Candidate will have to attempt any FIVE questions out of total EIGHT questions.

References:

1. Salivahanan S, Surcsh K N Vallavraj A. Electronic Devices and Circuiots, Tata McGraw Hill (2000)
2. Valkenburg V, Network Analysis, PHI
1. Malvino & Leach, Digital Electronic, Tata McGraw Hill.

B. Tech I/II Semester
(Common to all branches)
BASIC ELECTRONICS ENGINEERING PRACTICAL
(ECT-105)

L	T	P/D	Viva Voca:	40 Marks
-	-	2/2	Sessional:	10 Marks
			Time :	3 Hrs

List of Experiments:

1. Familiarization with Electronic Components and Equipment (CRO, Function Generator, DMM) - Part-I.
2. Familiarization with Electronic Components and Equipment (CRO, Function Generator, DMM)- Part-II.
3. Verification of Superposition and Millman's theorems.
4. Verification of Thevenin' s and Norton's theorems.
5. Transient response of series RL, RC, RLC circuits.
6. Study of operational amplifier-Gain Vs Bandwidth response.
7. Op-Amp. Applications-adder, differentiator/integrator.
8. Verification of Truth table of Gates and Flip-flops.
9. Study of Counters.
10. Study of registers.

**B.Tech. Ist Semester
(Common to all Branches)
Mathematics-I (MAT – 105T)**

L T P
3 2 -

Theory : 50 marks
Sessional : 50 marks
Time : 3 Hours

1. Differential Calculus:

UNIT – I

Curvature, Radius of curvature and Centre of curvature (Cartesian, polar, parametric and pedal form), Taylor's and Maclaurin's series, Expansion by known series, Expansion by forming the differential equation, Asymptotes (Cartesian and polar coordinates) and Tracing of curves (Cartesian, polar and parametric coordinates). **(10L)**

UNIT – II

2. Partial Derivatives and their applications:

Functions of two or more variables, Partial derivatives of second and higher orders, Euler's theorem on homogenous functions, Total derivatives, Differentiation of implicit and composite functions, Jacobians, Errors and approximations, Taylor's series, Maxima and minima of function of two variables, Lagrange's methods of undetermined multipliers, differentiation under the sign of integration (Leibnitz's rules). **(10L)**

3. Vector Calculus:

Review of elementary vector algebra, Differentiation and integration of vectors, Scalar and vector point functions, Gradient of a scalar point function, Divergence and Curl of a vector point function and their physical significance. **(8L)**

4. Matrix Theory:

UNIT – III

Rank of Matrix, Elementary transformations, Equivalent matrices and elementary matrices, Inverse of a matrix by Gauss-Jordan method, Characteristic equation, Eigen values and eigen vectors, Cayley Hamilton theorem, Orthogonal matrix, Diagonalization of matrices and Quadratic form, Complex matrices, Hermitian matrix, Unitary matrix. **(8L)**

5. Hyperbolic and Circular Functions

Exponential and circular functions of a complex variable, Hyperbolic and inverse hyperbolic functions, Real and imaginary parts of circular, hyperbolic and logarithmic functions, Summation of sine and cosine series. **(6L)**

Referred Books:

1. Advanced Engineering Mathematics by Erwin Kreyszig : Wiley Publishers
2. Advanced Engineering Mathematics by Peter V.O'Neil : CENGAGE Learning Publishers
3. Advanced Engineering Mathematics by John Bird : Elsevier Publishers

Recommended Books:

1. Advanced Engineering Mathematics by RK Jain & SRK Iyenger : Narosa Publishers
2. Engineering Mathematics Through Applications by Paras Ram : CBS Publishers
3. Engineering Mathematics (Vol. I) by Kuldeep Kumar : Bharat Publishers

Note to paper setter:

Set 9 questions in all, 3 from each Unit. Candidates have to attempt 5 questions selecting at least 1

question from each Unit.

B. Tech I Semester
(Common to all branches)
PHYSICS-I
(PHT-105)

L T P

3 1 2

Theory : 100
Sessional : 25
Total : 125
Time : 3 hours

UNIT I: CLASSICAL PHYSICS

PHYSICAL OPTICS:

Interference:

Division of wave front – Fresnel’s biprism; Division of amplitude interference – Newton’s rings, Michelson interferometer and its applications.

Diffraction:

Difference between Fraunhofer and Fresnel diffraction; Fraunhofer diffraction through a slit. Plane transmission diffraction grating, its dispersive and resolving power.

Polarization:

Polarized and unpolarized light; double refraction; Nicol prism, quarter and half wave plates, Polarimetry: Biquartz and Laurent’s half-shade polarimeters. Simple concepts of Photoelasticity.

(8)

WAVES AND OSCILLATIONS:

Simple- Harmonic Oscillations, Simple concepts of Harmonic Oscillator. Resonance, Quality factor.

E.M. wave theory-review of basic ideas, Maxwell’s equations and their experimental basis, simple plane wave equations, simple concepts of wave guides and co-axial cables, Poynting Vector.

(6)

DIELECTRICS:

Dielectrics– Molecular theory, polarization, displacement, susceptibility, dielectric coefficient, permittivity & various relations between these Gauss’s Law in the presence of a dielectric; Energy stored in an electric field. Poisson’s and Laplace’s equations, Divergence and curl of a vector, Stoke’s theorem (derivations not required in all equations and theorems) Behavior of dielectrics in ac fields-simple concepts, dielectric losses.

(6)

UNIT-II:

MODERN PHYSICS

Quantum Physics:

Difficulties with Classical Physics, Introduction to quantum mechanics- simple concepts, discovery of Planck’s Constant. Group velocity and phase velocity, Schrodinger wave equation, Postulates of quantum mechanics, Time dependent and time independent Schrodinger wave equations. Elementary ideas of quantum statistic

(6)

SPECIAL THEORY OF RELATIVITY:

The Michelson–Morley experiment; relativistic transformations; variation of mass with velocity; mass-energy equivalence.

(5)

NUCLEAR ENERGY:

Neutron Cross-section, Nuclear fission, Moderators, Nuclear reactors. Reactor criticality, Interaction of radiation with matter (basic concepts), Radiation Detectors- Ionization chamber; G.M. Counter; Scintillation and solid state detectors. Cloud chamber and bubble chamber.

(6)

Suggested books:

Optics	- F.W.Sears
Physics of the Atom	- Wehr, Richards & Adair
Perspectives of of Modern Physics	- Arthur Beiser
Physics-I,II	- Halliday and Resnick
Engineering Physics	- S.K.Srivastava and R.A.Yadav

NOTE: **Eight** questions will be set in the question paper, minimum **four** from each unit. Candidates will be required to attempt **five** questions selecting at least **two** questions from **each** unit.

B. Tech. Ist Semester (Common to all branches)
Chemistry-I (CHT-105)
(2012-13 onwards)

L	T	P
3	1	-

Theory:	50 Marks
Sessional:	50 Marks
Total:	100 Marks
Time:	3 Hrs.

DETAILED SYLLABUS (FOR DEPARTMENTAL USE)

1. **Chemical Kinetics:** Second order reactions, derivation of velocity constant with same and different concentrations of the reactants, half life period, basic concepts of complex reactions (definition, examples and derivation), collision theory and absolute reaction rate theory, Activation energy expression.

04 L

2. **Electrochemistry and Corrosion:** Types of electrodes (metal-metal ion, gas electrode, metal-insoluble salt and oxidation-reduction type electrode), half cell reactions, representation of cell reaction and examples, electrochemical cells, concentration cells, corrosion (dry and wet corrosion, mechanism (O_2 absorption and H_2 evolution with diagram), types of corrosion (water-line corrosion, stress corrosion, pitting corrosion, microbiological corrosion). Factors affecting the rate of corrosion, devices for the control of corrosion (design, cathodic protection, modification of environment and protective coatings).

08 L

3. **Photochemistry:** Photochemical and dark reactions, laws of photochemistry, quantum efficiency, classification of photochemical reactions on the basis of their quantum efficiencies, Non-radiative processes (isc and ic), fluorescence, phosphorescence (Jablonski diagram), chemiluminescence and photosensitization. technology based on photochemical processes (fluorescent, spectrophotometer, applications).

06 L

4. **Phase Rule:** Description of various terms (phase, component and degrees of freedom). One component system (water and sulphur systems), Supercooled water and metastable equilibrium, freeze drying. Two components system with simple eutectic formation (Pb-Ag and KI- H_2O systems), eutectic mixture and its applications, solders, safety plugs and freezing mixtures.

06 L

5. **Organic Chemistry:** Reaction intermediates: carbocations, carbanions, carbenes and free radicals (two methods of their generation, structure, explanation of their stability by

inductive effect, hyperconjugation method etc.), aromaticity and Huckel treatment of organic compounds (Some examples to explain the aromaticity of compounds avoiding mathematical treatment) , reaction mechanisms: SN^1 , SN^2 , E^1 and E^2 reactions, aromatic nucleophilic substitution and aromatic electrophilic substitution reactions (Role of substituent like ortho, para and meta directing group ie. -OH, -X, NO_2 groups).

04 L

6. Bioorganic Chemistry: Carbohydrates: Definition, classification, structure of glucose and fructose (open chain, cyclic), mutarotation, reducing and non reducing sugars and their degradation.

Proteins: Definition, classification, elementary idea about α -amino acids, isoelectric point, structure, denaturation and their degradation.

Lipids: Definition, types ,oil and fats, waxes, phospholipids (formulae) and their degradation (Knoop's theory or β -oxidation theory).

Enzymes: Definition, lock and key model, factor affecting enzyme action.

Coenzymes: Definition and few examples NAD, NADP, FAD, Co-A (with name and application), Structure of ATP/ADP.

06 L

7. Coordination Chemistry: Stability constant (definition, methods to find stability constant), various theories of bonding: valence bond theory, ligand field theory, crystal field theory, molecular orbital theory (diagrams with examples), determination of CFSE of few octahedral complexes (d^1 - d^{10} system), important applications of coordination compounds (mainly colouration, catalyst, medicinal applications ie cis-platin, MRI etc).

06 L

8. Modern techniques in structural elucidation of compounds: Introduction to spectroscopy, electro-magnetic spectrum and its range, principles, schematic diagrams of instruments and applications of UV-VIS, (Principle, allowed and forbidden transition, $n-\pi^*$, $\pi-\pi^*$ transition, Schematic diagram of instrument, examples), IR (Principle, Schematic diagram of instrument, factor affecting the frequency, stretching, bending, Hydrogen bonding (inter and intra), I-effect, conjugation etc., examples: carbonyls, alcohols, amines, aromatic and aliphatic (C-H), NMR spectroscopy (Principle, Schematic diagram of instrument, chemical shift, shielding, deshielding, TMS reference, some common examples).

04 L

9. Nanochemistry: Introduction, general methods of synthesis (3-4 methods), characterization (basics of XRD, SEM, UV) and applications of nano materials.

04 L

Total: 48 L

Note: The Paper Setter is requested to set eight questions in all. The students are required to attempt any five questions.

Books Recommended:

1. Concise Inorganic Chemistry by J.D. Lee.
2. Reaction mechanism in Organic Chemistry by S.M. Mukherji and S.P. Singh.
3. Nano biotechnology: Concept, applications and perspectives by C.M. Niemeyer and C.A. Mirkin.
4. Bioelectric Engineering Vol. II, Biological nanostructures and applications of nanostructures in Biology: Electrical, mechanical and optical properties by M.A. Strosio and M. Dutta.
5. Principles of Instrumental Analysis by D.A. Skoog, F.J. Holler and S.R. Crouch.
6. Principles of Physical Chemistry by B.R. Puri, L.R. Sharma and M.S. Pathania.
7. Chemistry in Engineering and Technology by T. Raja Ram and J.C. Kuriascose.
8. Engineering Chemistry by P.C. Jain and Monika Jain.
9. Chemistry for Environmental Engineering by C.N. Sawyer and P.L. McCarthy and G.F. Parkin.
10. Biochemistry by M.K. Campbell and S.O. Farrell.

B. Tech I/II Semester
(Common to all branches)
BASIC ELECTRICAL ENGINEERING
(ELT-105)

L	T	P
2	2/2	2/2

Theory :	100 Marks
Sessional:	25 Marks
Time :	3 Hrs

1. Electric Circuits:

Review of KCL, KVL and D.C. circuit analysis. Signals And wave forms, phasor representation of sinusoidal voltages and currents, power, power factor, analysis of series, and parallel circuits, resonance in series and parallel circuits Balanced three-phase systems, star- and delta- connections, relation between line and phase quantities (voltages and currents) in the two types of connection, analysis of three phase circuits, power in three phase circuits, measurement of power by two wattmeter method.

2. Magnetic Circuits:

Ampere turns, magnetomotive force, permeability, reluctance, composite magnetic circuits, comparison with electric circuits.

3. DC Machines:

Generators and motors, production of voltage and torque, characteristics of D.C generators and motors, speed control of dc shunt motor, application of dc generators and motors (only qualitative analysis)

4. Single phase transformers:

Principle of working, construction equivalent circuit, open circuit and short circuits tests, losses and efficiency.

5. Three-phase induction motors:

Principle of working, production of torque, torque-slip curve and applications. Introduction to single phase induction motors (only qualitative analysis)

Suggested Books:

1. V. Del Toro, "Principles of Electrical engineering", PHI.
2. E. Huges, "Electrical Technology", ELBS.
3. A. E. Fitzgerald, D. E. Higginbotham and A. Grabel, "Basic Electrical Engineering", MGH.
1. S. A. Nasar and C. R. Paul, "Introduction to Electrical Engineering", MGH.

B. Tech I/II Semester
(Common to all branches)
COMPUTER ENGINEERING
(COT-101)

L T
2 2/2

Theory : 100 Marks
Sessional: 25 Marks
Time : 3 Hrs

1. Introduction:

Overview of a computer system, Block diagram and major parts of a computer, history of computer development, introduction to binary, octal, & hexadecimal numbers, ASCII code, different levels of programming languages-machine language, assembly language, high level language; need of operating system, tree structure of storage, introduction to assembler, compiler and interpreter.

2. Basic of C Language:

C fundamentals; operators and expressions; i/p and o/p statements-getchar, putchar, scanf, printf; control statements - if-else, while, do-while, for, switch, break, continue, comma operator, goto statement.

3. Functions and Arrays:

Defining and accessing a function, function prototype, passing arguments to a function; defining and processing an array, passing an array to functions, 2-d arrays, arrays and strings.

Note for Paper Setter:

There will be 8 questions in all. Students will be asked to attempt any 5 questions. Only 1 question will be set from unit 1. Minimum 2 questions will be set from unit 2, and 3 questions will be set from unit 3.

BOOKS:

1. A. S. Tanenbaum: Structured Computer Organization, PHI. (Unit 1).
2. V. Rajaraman: Fundamentals of Computers, 3rd edition, PHI. (Unit 1).
3. Byre S. Gottfried: Theory and Problems of Programming with C Language Schaum Series, TMH. 1998. (Unit 2,3).
4. Kermgiam and Richie: The C programming Language, 2nd Edition, PHI.(Ref. Book).

**B. Tech I Semester
(Common to all branches)
ENGINEERING GRAPHICS-I
(CET-103)**

L T P/D
 3

Theory : 75 Marks
Sessional: 25 Marks
Time : 3 Hrs

PART-A

Orthographic Projections:

Theory of orthographic projections, planes of projection, four quadrants, first angle projection, third angle projection, B.I.S. Code of practice. View analysis, orientation of the object, laying out three views drawings, hidden lines and curved surfaces, conventional lines, dimensioning and lettering, Conversion of pictorial views into orthographics views, development of missing views.

PART-B:

Projections of Points, Straight Lines and Planes:

Points in different quadrants projections of lines-parallel to one or both planes, contained by one or both planes, perpendicular to a plane, inclined to one plane and parallel to the other, inclined to both planes, contained by a plane perpendicular to both planes. True length of a line and its inclinations with the reference plane, traces of a line.

Types of planes, perpendicular planes, oblique planes, traces of planes. projections of planes-parallel to one plane, perpendicular to both planes, perpendicular to one inclined to the other.

Projection of Solids:

Types of solids-polyhedral, solids of revolution. Projections of solids-axis perpendicular to a plane, axis parallel to both planes, axis parallel to one plane and inclined to other, axis inclined to both the planes.

Sections of Solids:

Section planes, sections, true shape of sections, Sections of prisms, pyramids, cylinders, cones placed in simple position.

Graphic Statics:

Basic concepts, Bow's notation, space-diagram, force and polar diagram, funicular polygon, support & support reactions, compressive and tensile stress, analysis of trusses, stresses in plane framed structures.

B. NOTE FOR PAPER SETTER

The question paper will comprise of EIGHT questions keeping ONE question from Part-A to be compulsory for students. Students shall be asked to attempt FIVE question in all.

Books Recommended:

Engineering Drawing by P. S. Gill (S. K. Kataria & Sons, Ludhiana)

A Text Book of Graphic Statics By P. S. Gill (S. K. Kataria & sons, Ludhiana) Elementary

Engineering Drawing by N. D. Bhatt (Charotar Publishing House, Anand).

B. Tech I Semester
(Common to all branches)
PHYSICS-I PRACTICAL
(PHT-107)

L	T	P/D	Viva Voce:	40 Marks
-	-	2	Sessional:	10 Marks
			Time :	3 Hrs

EXPERIMENTS

1. To determine the refractive index of the material of a lens.
2. To find the wavelength of light by Fresnel's biprism.
3. To find the wavelength of monochromatic light by using diffraction grating.
4. To verify Malus Law in polarization of light.
5. To find the wavelength of light by using Newton's rings.
6. To find the specific rotation of a solution by using a polarimeter.
7. To find a) the wavelength of sodium light b) the thickness of a thin transparent sheet by Michelson's interferometer.
8. To study the dielectric properties of a dielectric at different frequencies by resonance method.
9. To calibrate a voltmeter and an ammeter by using potentiometer.
10. To find high resistance by leakage method.
11. To find the temperature coefficient of resistance of platinum by using platinum resistance thermometer
12. To study the variation of magnetic field along the axis of a circular coil carrying current and to estimate the radius of the coil.
13. To find the frequency of AC mains using sonometer.
14. To plot a graph between the difference of temperature of two junctions and thermo e.m.f. for a thermocouple using a potentiometer.
15. To study the shunting effect of a voltmeter on voltage measurement.
16. To verify Stefan's radiation law by using incandescent filament.
17. To find the value of Planck's constant by photo electric cell.

NOTE: Students are required to do any twelve experiments.

B. Tech. Ist Semester (Common to all branches)
Chemistry-I Practical (CHT-107)
(2012-13 onwards)

L T P
- - 2

Sessional	:	60 Marks
End Sem. Exam.	:	40 marks
Total	:	100 marks
Time	:	3 Hrs.

S.No. **List of Experiments**

1. Determination of the strength (gL^{-1}) of Cu(II) ions present in a given copper ore solution iodometrically.
2. Determination of the strength (gL^{-1}) Fe(II) and Fe(III) ions present in a given iron ore solution by internal indicator method.
3. Determination of the rate constant for 2nd order reaction.
4. Determination of manganese dioxide in pyrolusite.
5. Estimation of nickel by gravimetric method as bis(dimethylglyoximato)nickel(II).
6. Determination of the strength (gL^{-1}) of strong acid and strong base/weak acid and strong base using conductometric titration method.
7. Separation of organic compounds using thin layer chromatographic technique.
8. Assignment of functional groups of given organic compounds (acids, esters, alcohols, aldehydes, amines etc.) by IR spectroscopic technique.
9. Detection of transition metal ions of different oxidation states.
10. Syntheses of Cu(II)/Fe(II)/(III) coordination compounds containing organic ligands and their characterization (m. pt., solubility test, yield, conductance and UV).
11. Identification of types of carbohydrates in the given sample.
12. Test for proteins and lipids.
13. Synthesis of nano materials and their characterization.
14. Determination of the composition of a liquid mixture by surface tension method using stalagmometer.
15. Investigatory project based on syllabus.

sB. Tcch, 1 Semester & 2 Sem
(Common to all branches)
Basic Electrical Engineering (ELT- 107)

List of Experiments

1. To draw Phaser diagram to scale (or series RL and RC circuits for different value ol'current & keeping applied voltage constant. R L - at 50 V and R C at 200 V Measure the resistance ol'choke.
2. To draw a graph between Current Vs Capacitance in Series RLC Circuit and Calculate inductance using results of resonance.
3. To measure three-phase power with Two-wattmeter method for balanced and unbalanced Loads connected in Star.
4. To Calibrate single phase Energy meter at unity power factor at (1) Full load (2) alf Load (3) Quarter Load.
5. To Perform load test on a single phase transformer and plot load current Vs (a) Terminal voltage (b) Efficiency
6. To measure Iron loss in a single phase transformer and to Find equivalent circuit parameters by performing open circuit and short circuit (e.sts.
7. To perform load lest on a DC shunt motor and plot out put Vs
(a) Input current (1) Speed (c) Torque and (d) Efficiency

B. Tech I/II Semester
(Common to all branches)
COMPUTER LAB
(COT-103)

L	T	P/D	Practical:	40 Marks
-	-	2/2	Sessional:	10 Marks
			Time :	3 Hrs

1. Understand the concept of operating system and learn related commands
Write C programs for following :
2. Addition, subtraction, multiplication, division of 2 numbers.
3. Find max and min of 3 numbers
4. Using while loop, find

$$S = 1 + 3 + 5 + \dots \text{ up to } N$$

$$S = x + x^2/2 + x^3/3 \dots N \text{ terms}$$
 Repeat these exercises using do-while loop.
5. Using for loop, calculate.

$$S = x + x^3/3! + x^5/5 \dots N \text{ terms}$$
6. Using loops, print following design

(a) 1 12 123 ...N lines	(b) * *** *****
-------------------------------------	--------------------------
7. Read 2 numbers. Read the choice of operation. Add them if + is pressed. Subtract if - is pressed. Similarly for multiplication (*) and division(/).
8. Repeat exercise 7 such that program gets repeated again and again until user wants to exit.
9. Using function, compute "C_m".
10. Using 1-d array, read n numbers and find average. Also find the largest of these numbers. Use functions to implement these operations. Write modular programs for the following:
11. Implement following operations on matrices
 - Addition of two matrices.
 - Transpose of a matrix
 - Multiplication of two matrices

B. Tech I Semester
(Common to all branches)
WORKSHOP PRACTICAL-I
(MET-105)

L	T	P/D
-	-	2

Practical:	40 Marks
Sessional:	10 Marks
Total :	50 Marks
Time :	3 Hrs

Introduction to various shops:

1. Machine Shop, Fitting Shop, Pattern Making, Foundry Shop and Welding Shop.

Machine Shop:

1. Introduction to conventional machine tools. i.e. Lathe machine, Milling Machine, Planner, Shaper and Hacksaw Machine etc.
2. Machine Operation on Lathe Machine i.e. facing, Turning, Step turning, Drilling etc.
3. Introduction to non-conventional machining. CNC and Automates.

Fitting Shop:

1. Introduction to various cutting, separating, parting, operational tools used in fitting shop.
2. Fitting operation fitting, drilling, tapping etc.

Pattern Making Shop:

1. Types of wood used in pattern making, its classification characteristics, its treatment etc.
2. Introduction of various operations in pattern making, its purpose and uses, operations on joints, i.e. planning, cutting, grooving etc.

Foundry Shop:

1. Basics of foundry, various operations, introduction to various equipments.

Welding Shop:

1. Introduction to welding, welding types, classification, safety precautions,
2. Operation on arc welding with butt joint.

Note:

Out of (Welding Shop 2) at least (Pattern Making Shop 2) are compulsory.

B.Tech. 2nd Semester
(Common to all Branches)
Mathematics-II (MAT – 106T)

L T P
3 1 -

Theory : 50 marks
Sessional : 50 marks
Time : 3 Hours

UNIT – I

1. Differential Equations and their Applications:

Linear differential equations of second and higher order with constant coefficients, Method of undetermined coefficients, Method of variation of parameters, Reducible to linear equation with constant coefficients (Cauchy's and Legendre's equations), Application to current flow in circuits.

(9L)

2. Series Solutions and Special Functions

Classification of singularities of an ordinary differential equation - series solution -

Method of Frobenius – indicial equation – examples.

Bessel and Legendre Functions: Bessel Function of first kind, Recurrence formulae, Generating function, Orthogonality of Bessel functions, Legendre polynomial, Rodrigue's formula, Generating function, Recurrence formula, Orthogonality of Legendre polynomials.

(9L)

UNIT-II

3. Partial Differential Equations:

Formation of Partial Differential Equations (P.D.E), Lagrange's Linear Partial Differential Equations, First order non-linear Partial Differential Equations (Standard forms and Charpit's method), Homogeneous and non-homogeneous P.D.E's with constant coefficients.

(7L)

4. Laplace Transforms:

Laplace transform of elementary functions, 1st shift property, Inverse Laplace transforms, transforms of derivatives of integrals, transforms of functions multiplied and divided by t, Laplace transform of periodic functions, Convolution theorem, Application of Laplace transform to solve ordinary linear differential equations and simultaneous differential equations with constant coefficients, Unit step function, Second shifting property, Unit impulse function, Application to electrical circuits.

(10L)

UNIT-III

5. Multiple Integrals:

Double Integral: Evaluation of double integral, change of order of integration, double integrals in polar coordinates, Application of double integral to find area enclosed by plane curves and volume of solids. Triple Integral: Evaluation of triple integrals, change of variables, volume of solids.

(7L)

Referred Books:

1. Advanced Engineering Mathematics by Erwin Kreyszig : Wiley Publishers
2. Advanced Engineering Mathematics by Michael D Greenberg : Pearsons Education
3. Advanced Engineering Mathematics by Alan Jafry : Academic Press
4. Differential Equations by GF Simmons: Tata McGraw Hills

Recommended Books:

1. Advanced Engineering Mathematics by RK Jain & SRK Iyenger : Narosa Publishers
2. Engineering Mathematics Through Applications by Paras Ram : CBS Publishers
3. Engineering Mathematics (Vol. II) by Kuldeep Kumar : Bharat Publishers

Note to paper setter:

Set 9 questions in all, 3 from Unit-I, 4 from Unit-II and 2 from Unit-III. Candidates have to attempt 5 questions selecting at least 1 question from each Unit.

B. Tech II Semester
(Common to all branches)
PHYSICS-II (PHT-106)

L T P
3 1 -

Theory : 75 Marks
Sessional: 25 Marks
Time : 3 Hrs

UNIT-I: SOLID STATE PHYSICS

Crystal Structure:

Space Lattice, unit cell and translation vectors; Miller indices, Simple crystal structure, Bonding in solids. (6)

Free Electron Theory:

Elements of classical free electron theory and its limitations, quantum theory of free electrons, Fermi level, Density of states, Fermi-Dirac distribution function, Thermionic emission, Richardson's equation. (5)

Band Theory of Solids:

Origin of energy bands, Kronig Penney Model (qualitative), E-K diagrams, Brillouin Zones, Concept of effective mass and holes, Classification into metals, Semiconductors and insulators, Fermi energy and its variation with temperature, Hall effect and its applications (5)

Photoconductivity and Photovoltaics:

Photoconductivity in insulating crystals, variation with illumination, effect of traps, applications of photoconductivity, Photovoltaics, Photovoltaic cells and their characteristics. (5)

Magnetic Properties of Solids:

Atomic magnetic moments, orbital diamagnetism, classical theory of paramagnetism, ferro magnetism, molecular field theory and domains. (5)

Superconductivity:

Discovery, Experimental facts and applications. (2)

UNIT-II: MODERN OPTICS

Lasers and Fibre Optics:

Spontaneous and stimulated emission ; Laser action, Characteristics of laser beam-concepts of coherence, He-Ne and semiconductor lasers (simple ideas), applications. Propagation of light in fibres; numerical aperture, single mode and multi mode fibres, applications. (7)

Suggested Books:

1. Introduction to Solid State Physics : Charles Kittel
2. Solid State Physics : S.O.Pillai
3. Lasers: Theory and Applications : Thyagarajan and Ghatak

NOTE:

EIGHT questions are to be set- SIX from Unit-I, TWO from Unit-II and the candidates will be required to attempt FIVE QUESTIONS selecting at least ONE from EACH unit.

B. Tech. 2nd Semester (Common to all branches)
Chemistry-II (CHT-106)
(2012-13 onwards)

L	T	P
2	1	-

Theory:	50 Marks
Sessional:	50 Marks
Total:	100 Marks
Time:	3 Hrs.

1. Polymers: Types and mechanisms of polymerization (free radical, anionic, cationic and coordination), effect of structure on properties of polymers, thermosetting resins (bakelite, epoxy), thermoplastics (low and high density polythenes, PMMA), rubbers (GR-S and GR-N) and their technical/industrial uses. Inorganic polymers: preparation, properties and technical/industrial uses of silicones. **06 L**

2. Water Treatment: Preparation of polished (intrinsic) water to be used for electronics devices, demineralization, desalination. Problems faced during the course of steam generation in boilers: scale and sludge formation, priming and foaming and boiler corrosion. Determination and significance of DO, BOD and COD. **05 L**

3. Fuels: Calorific value (HCV and LCV), determination of HCV by Bomb's calorimeter/Boy's gas calorimeter, proximate and ultimate analysis of coal. Coal liquification (Bergius and Fischer-Tropsch methods). Coal gasification (water gas and coal gas). **06 L**

4. Environmental Chemistry: Ozone layer depletion, photochemical smog, acid rain, green house effect, Bhopal gas release accident. Green Chemistry: Introduction, basic components and significance of Green Chemistry. **05 L**

5. Lubricants: Introduction and classification of lubricants, determination and significance of properties of oils (viscosity, viscosity index, acid value, saponification value, iodine value, pour point, cloud point, aniline point), greases, solid lubricants and related numericals. **05 L**

6. Inorganic Engineering Materials: Cement-composition and setting of cement; Glass-composition, properties, manufacture and types of glasses; Explosives-introduction, classification, requisites of explosives, plastic explosives, RDX, TNT and PETN. **06 L**

Total: 33 L

Note: The Paper Setter is requested to set eight questions in all. The students are required to attempt any five questions.

Books Recommended:

1. Environmental Chemistry by A.K. De.
2. Engineering Chemistry by P.C. Jain and Monika Jain.
3. Applied Chemistry, Theory and Practice by O.P. Vermani and A.K. Narula.
4. Industrial Chemistry by O.P. Vermani.
5. A text book of Engineering Chemistry by Shashi Chawla.**B. Tech II Semester**

(Common to all branches)
ENGINEERING GRAPHIC-II (MAT-103)

L	T	P	Theory :	100 Marks
-	-	6	Sessional:	50 Marks
			Time :	3 Hrs

Curves:

Conies. Cycloid. Epicycloid. Hypocycloid. Involute. Evolute. Spiral.

Inter-Section:

Interpenetration of simple solids i.e. prism with prism. Cylinder with cylinder. Cylinder with prism, cone-with cylinder and cone with prism (AXIS of solids horizontal or vertical only).

Development:

Development of right and oblique prism. Cylinder. Cone and pyramids. Sectioned solids. Practical Problems.

Isometric Projections:

Isometric scale. Isometric projections of simple solids and their combinations.

Engineering Graphics Standards:

Projections. Sectioning. Conventional representation. Dimensioning. Basis of tolerancing and surface finish symbols. BIS. ISO. DIN.

Fasteners:

Screw. Threads and threaded fasteners. Rivets and riveted joints. Welds and welded joints.

Machine Drawing:

Free hand drawing of simple machine parts i.e. cotter joint, knuckle joint and shaft couplings, pipe fittings and pipe joints.

Suggested Books:

- | | | | |
|----|-------------------------------|---|-----------------------|
| 1. | Engineering Drawing | : | N. D. Bhatt |
| 2. | Machine Drawing | : | N. D. Bhatt |
| 3. | Machine Drawing | : | N. Sidlieshwar |
| 4. | Engineering Drawing | : | P. S. Gill |
| 5. | Machine Drawing | : | P. S. Gill |
| 6. | Fundamentals of Engg. Drawing | : | Luzadder & Duff (PHI) |

B. Tech II Semester
(Common to all branches)
PHYSICS-II (PRACTICAL)
(PHT-I10)

L	T	P	Practical:	25
-	-	2/2	Sessional:	25
			Time :	3 Hrs

EXPERIMENTS

1. To calibrate an electromagnet using Guoy's balance.
2. To measure Hall's co-efficient of Germanium and calculation of charge carrier concentration.
3. To measure
 - a. Saturation magnetization.
 - b. Coercivity and Retentivity in a given ferromagnetic material.
2. To measure the velocity of ultrasonic waves in organic liquids.
3. To verify Richardson's thermionic emission equation.
4. To study the decay of charge on a capacitor and to find its capacitance.
5. To determine e/m of an electron.
6. To study I/V characteristics and rectification properties of a semiconductor diode.
7. To study characteristics of a thermistor.
8. To determine the resistivity of a semiconductor by four probe method.
9. To determine the band gap of germanium from the variation of its resistivity with temperature.
10. To study the intensity response of a cadmium sulphide cell.
11. To study a G.M. counter.
12. To draw the I-V characteristics of a solar cell under constant illumination.

NOTE: Students are required to do any eight experiments.

**. Tech. 2nd Semester (Common to all
branches) Chemistry-II Practical
(CHT-108)
(2012-13
onwards)**

L T P
- - 2

Sessional :
60 Marks End Sem.
Exam. : 40 marks
Total :
100 marks
Time : 3
Hrs.

<u>S.No.</u>	<u>List of Experiments</u>
---------------------	-----------------------------------

1. Determination of nitrite ions present in tap water.
2. Determination of alkalinity of irrigation water.
3. Determination of D.O. in the given sample of water.
4. Determination of total, calcium and magnesium hardness of water by
EDTA titration method.
5. Determination of calcium as calcium oxide volumetrically
in cement extract solution.
6. Determination of viscosity of lubricants by Redwood
viscometer.
7. Determination of acid value of an oil.
8. Determination of saponification value of an oil.
9. Determination of iodine value of an oil.
10. Determination of flash point of lubricant.
11. Determination of cloud and pour point of lubricant.
12. Preparation of (a) Phenol-formaldehyde resin and (b) urea-
formaldehyde resin.
13. Determination of nitrogen and sulphur in coal.
14. Investigatory project based on syllabus.

B. Tech II Semester
(Common to all branches)
WORKSHOP PRACTICAL-II
(MET-106)

L	T	P/D	Practical:	25 Marks
-	3	2	Sessional:	25 Marks
			Total :	50 Marks
			Time :	3 Hrs

EXPERIMENTS

1. Study of various and their utilities of a single points cutting tool and multi point Cutting Tools: i.e. drills and milling cutters in ASA system.
2. Prepare a job on a lathe having various operations viz. Drilling, boring, taper turning, thread cutting, knurling, etc.
3. Prepare a wooden pattern of the given item considering allowances etc.
4. Prepare a mould and casting of the pattern Sr. No. 3 prepared above.
5. study of electrical wiring, material tools used safety precautions, various circuits, its installation, inspection, earthing, distribution boxes and switches, etc.
6. Study and exercise on household wiring.
7. Study and exercise on staircase wiring.
8. Study and exercise on godown wiring.
9. Introduction to laboratory, its significance, various equipments available in it and their application in industry.
10. Study of linear, angular measuring devices and to measure the linear and angular dimensions using various equipments.
11. Study of various comparators and practice on it.
12. Practice of welding by electric arc welding in flat, horizontal and vertical position.

Note:

Out of above experiments 8 must be completed covering all shops.

B. Tech III/IV Semester
(Common to all branches)
MATHEMATICS-III
(MAT-201/202)

L T P
3 1 -

Theory : 75 Marks
Sessional: 50 Marks
Total : 125 Marks
Time : 3 Hrs

Part-A:

FINITE DIFFERENCES AND DIFFERENCE EQUATIONS

1. Finite Differences:

Finite differences, Difference operators, Newton's forward and backward interpolation formulae, Bessel's formula and Stirling's formula, Lagrange's interpolation formula for unequal intervals, Numerical differentiation. Numerical Integration: Newton-cote's quadrature formula (Trapezoidal rule, Simpson's 1/3 and 3/8 rule), Gaussian quadrature formula. (9L)

2. Difference Equations:

Formation of difference equations, solution of linear difference equations. (4L)

Part-B:

NUMERICAL METHODS WITH PROGRAMMING

1. Numerical Solution of algebraic and transcendental Equations:

Bisection method, Regula-Falsi method, Newton Raphson method. Secant method. (4L)

2. Solution of Linear Simultaneous Equations:

Gauss elimination method, Gauss-Jordan method, Crout's triangularisation method, Jacobi's iteration method, Gauss-Seidel iteration method. (5L)

3. Numerical solution of ordinary differential equations:

Picard's method, Ruler's method, Runge-Kutta method, Milne's predictor-corrector method, Adams-Bashforth method. (6L)

Part-C

1. Statistical Methods:

Method of Least Square and curve fitting, Correlation, Coefficient of Correlation, Rank correlation Regression and lines of Regression, Binomial distribution, Poisson distribution and Normal distribution with their properties and applications. (8L)

2. Operational Research:

Linear programming problems formulation. Solving linear programming problems using i) Graphical methods ii) Simplex method iii) Dual Simplex method. (5L)

Note to Paper Setter:

Set 9 questions in all, 3 from each part. Candidates have to attempt 5 questions selecting, atleast 1 question from each part.

Books Recommended:

- | | | |
|----------------------------------------------------|---|----------------------|
| 1. Numerical Methods for Engineers | : | Steven C. Chapra |
| 2. Numerical Mathematical Analysis | : | James B. Scarborough |
| 3. Mathematical Analysis in Engineering | : | Chang C. Mei |
| 4. Statistical Theory with Engineering Application | : | A. Hald |
| 5. Mathematical Statistics | : | C. E. Weatherburn |
| 6. Operational Research | : | H. A. Taha |
| 7. Higher Engineering Mathematics | : | B. S. Grewal |

(Common to all branches, 3rd and 4th semesters of B.Tech.)

ORGANISATIONAL BEHAVIOUR

L T
2 1

HUT-211

Theory : 60 Marks
Sessionals : 40 Marks
Total : 100 Marks
Time : 3 Hrs.

Note for the Paper Setter: The total number of questions to be set will be six, one question on each unit. The examinees shall attempt any four. All questions shall carry equal marks.

UNIT-I INTRODUCTION

Concept of Organisational Behaviour, Nature of Organisational Behaviour, Organisational Behaviour and other similar fields of study – Psychology, Sociology, Anthropology, Political Science. Approaches to Organisational Behaviour. Challenges and opportunities for Organizational Behaviour

UNIT-II UNDERSTANDING AND MANAGING INDIVIDUAL BEHAVIOUR

Values,
Job
Concept of Behaviour, Process of Behaviour, Foundations of Individual Behaviour.
Attitudes and Job Satisfaction: Importance of values, Types of values. Concept of Attitudes, Theories of Attitude Formation. Factors in Attitude Formation. Measuring Satisfaction, the effect of Job Satisfaction Employee on Performance

UNIT-III UNDERSTANDING PERSONALITY AND PERCEPTION

Personality

Behaviour.
What is Personality? Determinants of Personality, Personality Traits affecting Behaviour.

Perception

Concept of Perception, Perceptual Process, Factors influencing Perception.

Learning

Concept of Learning, Components of Learning Process, Factors affecting Learning.

UNIT-IV UNDERSTANDING AND MANAGING GROUP BEHAVIOUR

Group Dynamics

Concept of Group Dynamics, Concept of Group, Formal and Informal Groups, Group Behaviour.

Communication

Concept of Communication, the Communication Process, Barriers in Communication, Essentials of Effective Communication

Leadership

Meaning of Leadership, Leadership Theories-Charismatic Leadership Theory, Trait Theory, Behavioural Theory.

UNIT-V UNDERSTANDING AND MANAGING ORGANISATIONAL SYSTEM

Design of Organisation Structure

Concept of Organisation Structure, forms of Organisation Structure, Contingent Factors in Organisational Design.

Organisational Culture

What is Organisational Culture? What do Cultures Do? Creating and Sustaining culture.

Work Stress

What is Stress? Course of Stress, Effects of Stress, Managing Stress.

Organisational Change

Nature of Organisational Change, Factors of Organisational Change, Planned Change, Process of Planned Change, Resistance to Change, Overcoming Resistance to Change.

UNIT-VI UNDERSTANDING THE CONCEPT AND THEORIES OF MOTIVATION

Motivation

Concept of Motivation, Motivation and Behaviour, Theories of Motivation-Maslow's Need Hierarchy Theory, Herzberg's Motivation-Hygiene Theory, McGregor's Theory X and Theory Y.

Suggested Books

1. Organisational Behaviour – Stephen P. Robbins (Pearson Education)
2. Organisational Behaviour- Fred Luthans (MacGraw Hill, New York)
3. Organisational Behaviour – L.M. Prasad (Sultan Chand & Sons, New Delhi)