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II Year B.Tech. C.E. I Sem
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(53001) MATHEMATICS – II

UNIT – I: Linear Systems

Matrices: Elementary row transformations – Rank – Normal form - Echelon form – Consistency – Solution of system of simultaneous linear homogeneous and non-homogeneous equations.

UNIT – II : Eigen values & Eigen vectors

Eigen Values, Eigen vectors - properties – Cayley-Hamilton Theorem - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonolization of matrix. Calculation of powers of matrix – Modal and spectral matrices.

UNIT-III: Linear Transformations

Real matrices -Symmetric, skew - symmetric, orthogonal, Linear Transformation - Orthogonal Transformation. Complex matrices: Hermitian, Skew-Hermitian and Unitary – Eigen values and Eigen vectors of complex matrices and their properties.

UNIT –IV: Quadratic forms

Quadratic Forms - Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index - signature - Sylvester law, Applications of quadratic forms.

UNIT-V : Fourier Series

Fourier Series: Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

UNIT –VI : Introduction to partial differential equations

Formation of partial differential equations by elimination of arbitrary

constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations.

UNIT –VII: Solution of partial differential equations

Classification of second order linear Partial Differential Equations, separation of variables methods for the solutions of one dimensional heat equation, wave equation and two-dimensional Laplace's equation under initial and boundary conditions.

UNIT-VIII: Fourier transforms

Fourier integral theorem - Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

TEXT BOOKS:

1. Engineering Mathematics – II by P.B. Bhaskara Rao, S.K.V.S.Rama Chary, M.Bhujanga Rao, B.S. Publications.

2. Engineering Mathematics – II by G.Shankar Rao & Others, I.K. International Publications.

REFERENCES:

1. Engineering Mathematics – II by T.K.V. Iyengar, B.Krishna Gandhi & Others, S.Chand.

2. Higher Engineering Mathematics by B.S.Grewal, Khanna Publications.

3. Engineering Mathematics – II by Engineering Mathematics – II by C. Shankaraiah, Vijaya Publications.

4. Advanced Engineering Mathematics by Jain and S.R.K. Iyengar, Narasa Publications.

5. Engineering Mathematics – II by Dr. A. Anjaneyulu & others, Deepti Publications.

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(53002) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

UNIT-I
ELECTRICAL CIRCUITS

Basic definitions, Types of elements, Ohm's Law, Resistive networks, Kirchhoff's Laws, Inductive networks, Capacitive networks, Series, Parallel circuits and Star-delta and deltastar transformations.

UNIT II
DC MACHINES

Principle of operation of DC Generator – emf equation - types – DC motor types – torque equation – applications – three point starter.

UNIT III
TRANSFORMERS

Principle of operation of single phase transformers – emf equation – losses – efficiency and regulation

UNIT IV
AC MACHINES

Principle of operation of alternators – regulation by synchronous impedance method – Principle of operation of induction motor – slip – torque characteristics – applications.

UNIT V
INSTRUMENTS

Basic Principle of indicating instruments – permanent magnet moving coil and moving iron instruments.

UNIT VI

DIODE AND IT'S CHARACTERISTICS

P-N junction diode, symbol, V-I Characteristics, Diode Applications, Rectifiers – Half wave, Full wave and Bridge rectifiers (simple Problems)

UNIT VII

TRANSISTORS

P-N-P and N-P-N Junction transistor, Transistor as an amplifier, SCR characteristics and applications

UNIT VIII:

CATHODE RAY OSCILLOSCOPE

Principles of CRT (Cathode Ray Tube), Deflection, Sensitivity, Electrostatic and Magnetic deflection, Applications of CRO - Voltage, Current and frequency measurements.

TEXT BOOKS:

1. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin

2. Principles of Electrical and Electronics Engineering by V.K.Mehta, S.Chand & Co.

REFERENCES :

1. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.

2. Basic Electrical Engineering by Kothari and Nagarath, TMH Publications, 2nd Edition.

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(53003) STRENGTH OF MATERIALS – I

UNIT – I

SIMPLE STRESSES AND STRAINS :

Elasticity and plasticity – Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – composite bars – Temperature stresses.

STRAIN ENERGY – Resilience – Gradual, sudden, impact and shock loadings – simple applications.

UNIT – II

SHEAR FORCE AND BENDING MOMENT :

Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilver, simply supported and overhanging beams subjected to point loads, uniformly distributed load, uniformly varying loads and combination of these loads – Point of contraflexure – Relation between S.F., B.M and rate of loading at a section of a beam.

UNIT – III

FLEXURAL STRESSES:

Theory of simple bending – Assumptions – Derivation of bending equation: $M/I = f/y = E/R$ - Neutral axis – Determination of bending stresses – Section modulus of rectangular and circular sections (Solid and Hollow), I,T,Angle and Channel sections – Design of simple beam sections.

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UNIT – IV

SHEAR STRESSES :

Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections.

UNIT – V

DEFLECTION OF BEAMS :

Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, U.D.L, Uniformly varying load-Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

UNIT – VI

PRINCIPAL STRESSES AND STRAINS :

Introduction – Stresses on an inclined section of a bar under axial loading – compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear – Mohr's circle of stresses – Principal stresses and strains – Analytical and graphical solutions – Various Theories of failures like Maximum Principal stress theory – Maximum Principal strain theory – Maximum shear stress theory – Maximum strain energy theory – Maximum shear strain energy theory.

UNIT – VII

THIN CYLINDERS :

Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Thin spherical shells.

UNIT – VIII

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THICK CYLINDERS :

Introduction Lame's theory for thick cylinders – Derivation of Lame's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage – Thick spherical shells.

TEXT BOOKS:

1. Mechanics of Materials – Dr. B. C. Punmia, Laxmi Publications.

2. Strength of Materials – B. S. Basavarajaiah, University Press, Hyderabad.

REFERENCES :

1. Mechanics of Solid, by Ferdinandp Beer and others – Tata Mc.Grawhill Publications 2000.

2. Strength of Materials by Schaum's out line series – Mc. GrawPhill International Editions.

3. Strength of materials by R.K.Rajput, S.Chand & Co, New Delhi.

4. Strength of Materials by A.R.Basu, Dhanpat Rai & Co, Nai Sarah, New Delhi.

5. Strength of Materials by Bhavi Katti. New Age Publications.

6. Strength of Materials by R. Subramanian, Oxford University Press, New Delhi

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(53004) SURVEYING

UNIT – I

INTRODUCTION: Overview of plane surveying (chain, compass and plane table), Objectives, Principles and classifications.

UNIT – II:

DISTANCES AND DIRECTION: Distance measurement conventions and methods; use of chain and tape, Electronic distance measurements, Meridians, Azimuths and Bearings, declination, computation of angle.

UNIT – III

LEVELING AND CONTOURING: Concept and Terminology, Temporary and permanent adjustments- method of leveling.

Characteristics and Uses of contours- methods of conducting contour surveys and their plotting.

UNIT – IV

COMPUTATION OF AREAS AND VOLUMES: Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

UNIT - V

THEODOLITE: Theodolite, description, uses and adjustments – temporary and permanent, measurement of horizontal and vertical angles. Principles of Electronic Theodolite. Trigonometrical leveling, Traversing.

UNIT – VI

TACHEOMETRIC SURVEYING:

Stadia and tangential methods of Tacheometry. Distance and Elevation formulae for Staff vertical position.

UNIT – VII

Curves: Types of curves, design and setting out – simple and compound curves.

UNIT - VIII

INDTRODUCTION TO ADVANCED SURVEYING : Introduction to geodetic surveying, Total Station and Global positioning system, Introduction to Geographic information system (GIS).

TEXT BOOKS:

1. "Surveying (Vol – 1, 2 & 3), by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi

2. Duggal S K, "Surveying (Vol – 1 & 2), Tata Mc.Graw Hill Publishing Co. Ltd. New Delhi, 2004.

3. Text book of surveying by C.Venkataramaiah, Unversiities Press

REFERENCES:

1. Arthur R Benton and Philip J Taety, Elements of Plane Surying, McGraw Hill – 2000

2. Arora K R "Surveying Vol 1, 2 & 3), Standard Book House, Delhi, 2004

3. Chandra A M, "Plane Surveying", New age International Pvt. Ltd., Publishers, New Delhi, 2002.

4. Chandra A M, "Higher Surveying", New age International Pvt. Ltd., Publishers, New Delhi, 2002.

5. Surveying and levelling by R. Subramanian, Oxford university press, New Delhi

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(53005) FLUID MECHANICS

UNIT I

INTRODUCTION : Dimensions and units – Physical properties of fluids specific gravity, viscosity, surface tension, vapor pressure and their influences on fluid motion pressure at a point, Pascal's law, Hydrostatic law - atmospheric, gauge and vacuum pressure-measurement of pressure. Pressure gauges, Manometers: differential and Micro Manometers.

UNTI – II

HYDROSTATIC FORCES : Hydrostatic forces on submerged plane, Horizontal, Vertical, inclined and curved surfaces – Center of pressure. Derivations and problems.

UNTI – III

FLUID KINEMATICS : Description of fluid flow, Stream line, path line and streak lines and stream tube. Classification of flows : Steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one, two , three dimensional flows – stream and velocity potential functions, flownet analysis.

UNIT – IV

FLUID DYNAMICS: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line for 3-D flow, (Navier – stokes equations (Explanationary) Momentum equation and its application – forces on pipe bend.

UNIT – V

BOUNDARY LAYER THEORY : Approximate Solutions of Navier Stoke's Equations – Boundary layer – concepts, Prandtl contribution, Characteristics of boundary layer along a thin flat plate, Vonkarmen

momentum integral equation, laminar and turbulent Boundary layers (no deviation), BL in transition, separation of BL, control of BL, flow around submerged objects-Drag and Lift- Magnus effect.

UNIT – VI

LAMINAR & TURBULENT FLOWS : Reynold's experiment – Characteristics of Laminar & Turbulent flows. Flow between parallel plates, Flow through long tubes, flow through inclined tubes.

UNIT - VII

CLOSED CONDUIT FLOW: Laws of Fluid friction – Darcy's equation, Minor losses – pipes in series – pipes in parallel – Total energy line and hydraulic gradient line. Pipe network problems, variation of friction factor with Reynold's number – Moody's Chart.

UNIT – VIII

MEASUREMENT OF FLOW : Pitot tube, Venturi meter and orifice meter – classification of orifices, flow over rectangular, triangular and trapezoidal and Stepped notches - –Broad crested weirs.

TEXT BOOKS:

1. Fluid Mechanics by Modi and Seth, Standard book house.
2. Introduction to Fluid Machines by S.K.Som & G.Biswas (Tata Mc.Grawhill publishers Pvt. Ltd.)
3. Introduction to Fluid Machines by Edward J. Shaughnessy, Jr, Ira M. Katz and James P. Schaffer , Oxford University Press, New Delhi

REFERENCES:

1. Fluid Mechanics by J.F.Douglas, J.M. Gaserek and J.A.Swaffirld (Longman)
2. Fluid Mechanics by Frank.M. White (Tata Mc.Grawhill Pvt. Ltd.)
3. Fluid Mehanics by A.K. Mohanty, Prentice Hall of India Pvt. Ltd., New Delhi
4. A text of Fluid mechanics and hydraulic machines by Dr. R.K. Bansal - Laxmi Publications (P) ltd., New Delhi.
5. Fluid Mechanics and Machinery by D. Ramdurgaia New Age Publications.

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(53006) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Unit I Introduction to Managerial Economics:

Definition, Nature and Scope of Managerial Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

Unit II *Elasticity of Demand*: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

Unit III Theory of Production and Cost Analysis: Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: Cost concepts, Opportunity cost, Fixed vs. Variable costs, Explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)- Managerial Significance and limitations of BEA.

Unit IV Introduction to Markets & Pricing Policies:

Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly.

Objectives and Policies of Pricing- Methods of Pricing: Cost Plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Two-Part Pricing, Block Pricing, Bundling Pricing, Peak Load Pricing,

Cross Subsidization.

Unit V Business & New Economic Environment: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

Unit VI Capital and Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.

Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

Unit VII Introduction to Financial Accounting: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

Unit VIII Financial Analysis through ratios: Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt- Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Profit Ratio, P/E Ratio and EPS).

TEXT BOOKS:

1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2009.

2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.

REFERENCES:

1. Raghunatha Reddy & Narasimhachary: Managerial Economics& Financial Analysis, Scitech, 2008.

2. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 2009

3. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 2009.

4. Suma Damodaran, Managerial Economics, Oxford University Press, 2009.

5. Lipsey & Chrystel, Economics, Oxford University Press, 2009.

6. Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson, 2009.

7. Narayanaswamy: Financial Accounting—A Managerial Perspective, PHI, 2008.

8. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2008.

9. Truet and Truet: Managerial Economics:Analysis, Problems and Cases, Wiley, 2009.

10. Dwivedi:Managerial Economics, Vikas, 2009.

Prerequisites: Nil

Objective: To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making.

Codes/Tables: Present Value Tables need to be permitted into the examinations Hall.

Question Paper Pattern: 5 Questions to be answered out of 8 questions.

Each question should not have more than 3 bits.

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(53600) SURVEYING LAB – I

LIST OF EXERCISES :

1. Survey of an area by chain survey (closed traverse) & Plotting

2. Chaining across obstacles

3. Determination of distance between two inaccessible points with compass.

4. Surveying of a given area by prismatic compass (closed traverse) and plotting after adjustment.

5. Radiation method, intersection methods by plane Table survey

6. Two point and three point problems in plane table survey

7. Traversing by plane table survey

8. Fly leveling (differential leveling)

9. An exercise of L.S and C.S and plotting

10. Two exercises on contouring.

List of Major Equipment:

1. Chains, tapes, Ranging rods, cross staff, arrows

2. Compasses and Tripods, Optical square.

3. Plane tables, Alidade, Plumbing fork, trough compasses

4. Leveling instruments and leveling staves

5. Box sextants, planimeter.

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(53601) STRENGTH OF MATERIALS LAB

1. Tension test
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges
12. Continuous beam – deflection test.

List of Major Equipment:

1. UTM for conducting tension test on rods
2. Steel beam for flexure test
3. Wooden beam for flexure test
4. Torsion testing machine
5. Brinnell's / Rockwell's hardness testing machine
6. Spring testing machine
7. Compression testing machine
8. Izod Impact machine
9. Shear testing machine
10. Beam setup for Maxwell's theorem verification.
11. Continuous beam setup
12. Electrical Resistance gauges.