

ENGINEERING MATHEMATICS – III

CODE: 10 MAT 31
Hrs/Week: 04
Total Hrs: 52
Marks:100

IA Marks: 25
Exam Hrs: 03
Exam

PART-A

Unit-I: FOURIER SERIES

Convergence and divergence of infinite series of positive terms, definition and illustrative examples*
Periodic functions, Dirichlet's conditions, Fourier series of periodic functions of period 2π and arbitrary period, half range Fourier series. Complex form of Fourier Series. Practical harmonic analysis. [7 hours]

Unit-II: FOURIER TRANSFORMS

Infinite Fourier transform, Fourier Sine and Cosine transforms, properties, Inverse transforms [6 hours]

Unit-III: APPLICATIONS OF PDE

Various possible solutions of one dimensional wave and heat equations, two dimensional Laplace's equation by the method of separation of variables, Solution of all these equations with specified boundary conditions. D'Alembert's solution of one dimensional wave equation. [6 hours]

Unit-IV: CURVE FITTING AND OPTIMIZATION

Curve fitting by the method of least squares- Fitting of curves of the form $y = ax + b$, $y = ax^2 + bx + c$, $y = ae^{bx}$, $y = ax^b$

Optimization: Linear programming, mathematical formulation of linear programming problem (LPP), Graphical method and simplex method.

[7 hours]

PART-B

Unit-V: NUMERICAL METHODS - 1

Numerical Solution of algebraic and transcendental equations: Regula-falsi method, Newton - Raphson method. Iterative methods of solution of a system of equations: Gauss-seidel and Relaxation methods. Largest eigen value and the corresponding eigen vector by Rayleigh's power method.

[6 hours]

Unit-VI: NUMERICAL METHODS – 2

Finite differences: Forward and backward differences, Newton's forward and backward interpolation formulae. Divided differences - Newton's divided difference formula, Lagrange's interpolation formula and inverse interpolation formula.

Numerical integration: Simpson's one-third, three-eighth and Weddle's rules (All formulae/rules without proof)

[7 hours]

Unit-VII: NUMERICAL METHODS – 3

Numerical solutions of PDE – finite difference approximation to derivatives, Numerical solution of two dimensional Laplace's equation, one dimensional heat and wave equations

[7 hours]

Unit-VIII: DIFFERENCE EQUATIONS AND Z-TRANSFORMS

Difference equations: Basic definition; Z-transforms – definition, standard Z-transforms, damping rule, shifting rule, initial value and final value theorems. Inverse Z-transform. Application of Z-transforms to solve difference equations.

[6 hours]

Note: * In the case of illustrative examples, questions are not to be set.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Latest edition, Khanna Publishers
2. Erwin Kreyszig, Advanced Engineering Mathematics, Latest edition, Wiley Publications.

Reference Book:

1. B.V. Ramana, Higher Engineering Mathematics, Latest edition, Tata Mc. Graw Hill Publications.
2. Peter V. O'Neil, Engineering Mathematics, CENGAGE Learning India Pvt Ltd. Publishers

BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY (COMMON TO CV/TR/CTM)

Sub Code	:	10 CV 32	IA Marks	:	25
Hrs/ Week	:	04	Exam Hours	:	03
Total Hrs.	:	52	Exam Marks	:	100

Part-A

UNIT-1

FOUNDATION

Function and requirements of a good foundation, Types of foundations, Preliminary investigation of soil, Safe Bearing Capacity of Soil, Introduction to spread, combined, strap, mat and pile foundations, Design of strip and combined footings 6 hours

UNIT-2

MASONRY

Classification of Masonry, Definition of terms used in Masonry, Introduction to classification and qualities of bricks, Bonds in Brick work - English Bond, Flemish Bond, Reinforced, Brick Masonry, Common building stones, their properties and uses, Classification of stone masonry, Joints in stone masonry, Introduction to load bearing, cavity and partition walls. 8 hours

UNIT-3

ARCHES, LINTEL AND BALCONY

Elements of an arch, Classification of arches, Stability of arch, Definition and classification of Lintels, Definition and functions of Chejja, Canopy & Balcony. 6 hours

UNIT-4

ROOFS AND FLOORS

Types of Roofs & Roofing materials, Flat roof (RCC), Types of pitched roofs, Wooden Truss, Steel trusses, Types of flooring, Factors affecting selection of flooring materials. 7 hours

Part-B

UNIT-5

DOORS AND WINDOWS

Location of doors and windows, Definition of technical terms, Types of Doors, Types of windows, Varieties of materials for doors and windows & their properties. 6 hours

UNIT-6

STAIRS

Definition of technical terms, Requirements of ground stair, Types of Stairs, Geometrical design of RCC Dog legged and open well stairs (Plain and sector elevation). 6 hours

UNIT-7

PLASTERING AND PAINTING

Purpose of plastering, Materials of plastering, Methods of plastering, Defects in plastering, Introduction to Paintings and types of Painting, Constituents of paints & types, Purpose of Painting, Defects in Painting, Application of Paints to new and old surfaces. 6 hours

UNIT-8

MISCELLANEOUS TOPICS

Properties and uses of plastics, aluminum, glasses, varnishes, Introduction to smart materials and its application, Introduction to formwork and scaffolding,

Formwork details for RCC Column, Beams and Floors, Shoring and under pinning, Damp Proofing - Causes of Dampness, Effects of Dampness, Methods of Damp Proofing
7 hours

TEXT BOOKS

1. **Engineering Materials**, Rangawala P.C. Charter Publishing House, Anand, India.
2. **Engineering Materials**, Sushil Kumar, Standard Publication and Distributors, New Delhi.
3. **Concrete technology – Theory and practice**, M..S. Shetty, S. Chand and Co, New Delhi, 2002.

REFERENCE BOOKS

1. **A Text Book Building Materials**, by P.G. Varghese, Prentice-Hall of India Pvt. Ltd., Publication.
2. **Advances in Building Materials and Construction** by Mohan Rai and M.P. Jain Singh – publication by CBRI, Roorkee.
3. **Concrete Technology**, Neville A.M and Brooks J.J — ELBS Edition. London
4. **Concrete Technology** – Gambhir M.L –Dhanpat Rai and Sons, New Delhi.

STRENGTH OF MATERIALS (COMMON TO CV/TR/EV/CTM)

Sub Code	:	10 CV 33	IA Marks	:	25
Hrs/ Week	:	04	Exam Hours	:	03
Total Hrs.	:	52	Exam Marks	:	100

PART – A

UNIT 1:

Simple Stress and Strain

1.1 Introduction, 1.2 Properties of Materials, 1.3 Stress, Strain, Hook's law, 1.4 Poisson's Ratio, 1.5 Stress – Strain Diagram for structural steel and non ferrous materials, 1.6 Principles of superposition, 1.7 Total elongation of tapering bars of circular and rectangular cross sections. Elongation due to self – weight

7 Hours

UNIT 2:

Simple Stress and Strain continued...

2.1 Composite section, 2.2 Volumetric strain, expression for volumetric strain, 2.3 Elastic constants, relationship among elastic constants, 2.4 Thermal stresses (including thermal stresses in compound bars).

UNIT 3:

Compound stresses

3.1 Introduction, 3.2 Stress components on inclined planes, 3.3 General two-dimensional stress system, 3.4 Principal planes and stresses, 3.5 Mohr's circle of stresses.

8 Hours

UNIT 4:

Bending moment and shear force in beams

4.1 Introduction, 4.2 Types of beams loadings and supports, 4.3 Shearing force in beam, 4.4 Bending moment, 4.5 Sign convention, 4.6 Relationship between loading, shear force and bending moment, 4.7 Shear force and bending moment equations, SFD and BMD with salient values for cantilever beams, simply supported beams and overhanging beams considering point loads, UDL, UVL and Couple.

7 Hours

PART – B

UNIT 5:

Bending stress, shear stress in beams

5.1 Introduction – Bending stress in beam, 5.2 Assumptions in simple bending theory, 5.3 Pure bending derivation of Bernoulli's equation, 5.4 Modulus of rupture, section modulus, 5.5 Flexural rigidity, 5.6 Expression for horizontal shear stress in beam, 5.7 Shear stress diagram for rectangular, symmetrical 'I' and 'T' section (Flitched beams not included).

6 Hours

UNIT 6:

Deflection of beams

6.1 Introduction – Definitions of slope, deflection, 6.2 Elastic curve-derivation of differential equation of flexure, 6.3 Sign convention 6.4 Slope and deflection for standard loading classes using Macaulay's method for prismatic beams and overhanging beams subjected to point loads, UDL and Couple.

6 Hours

UNIT 7:

Torsion of circular shafts

7.1 Introduction – Pure torsion-torsion equation of circular shafts, 7.2 Strength and stiffness, 7.3 Torsional rigidity and polar modulus, 7.4 Power

transmitted by shaft of solid and hollow circular sections.

6 Hours

UNIT 8:

Elastic stability of columns

8.1 Introduction – Short and long columns, 8.2 Euler’s theory on columns, 8.3 Effective length slenderness ration, 8.4 radius of gyration, buckling load, 8.5 Assumptions, derivations of Euler’s Buckling load for different end conditions, 8.6 Limitations of Euler’s theory, 8.7 Rankine’s formula and problems.

6 Hours

TEXT BOOKS:

1. **Strength of Materials**, Subramanyam, Oxford University Press, Edition 2008
2. **Mechanics of Materials**, B.C Punmia Ashok Jain, Arun Jain, Lakshmi Publications, New Delhi.
3. **Strength of Materials**, Basavarajaiah and Mahadevappa Universities Press (2009).

REFERENCE BOOKS:

1. **Strength of Materials**, Singer Harper and Row Publications.
2. **Elements of Strength of Materials**, Timoshenko and Young Affiliated East-West Press.
3. **Mechanics of Materials**, James M. Gere (5th Edition), Thomson Learning.

**SURVEYING – I (COMMON TO
CV/TR/EV/CTM)**

Sub Code	:	10 CV 34	IA Marks	:	25
Hrs/ Week	:	04	Exam Hours	:	03
Total Hrs.	:	52	Exam Marks	:	100

PART – A

UNIT 1:

Introduction

1.1 Definition of Surveying, 1.2 Classification of Surveys, 1.3 Uses of Surveying Units of Measurements, 1.4 Map & Classification, 1.5 Survey of India topographical Maps and their numbering., 1.6 Basic principles of surveying, 1.7 Errors, Classification, 1.8 Precision and accuracy.

04 Hours

UNIT 2:

Measurement of horizontal distances.

2.1 Chain and types, 2.2 Tape and types, 2.3 EDM devices, 2.3 Ranging of lines 2.4 Direct and Indirect, 2.5 Measurement of distances over sloping grounds, 2.6 Chain and Tape corrections - Numerical problems.

5 Hours

UNIT 3:

Chain Surveying

3.1 Accessories required, 3.2 Selection of stations and lines, 3.3 Offsets and types 3.4 Setting out of right angles, 3.5 Working principle and use of optical square, prism square, cross staff., 3.6 Linear methods of setting out right angles, 3.7 Booking of chain survey work, 3.8 Field book, entries, conventional symbols, 3.9 Obstacles in chain survey, Numerical problems, 3.10 Errors in chain survey and precautions to be taken.

7 Hours

UNIT 4:

Compass Surveying

4.1 Meridians and bearings, 4.2 Principle, working and use of - Prismatic compass 4.3 Surveyor's compass, 4.4 Magnetic bearing, true bearings, 4.5 WCB and Reduced bearing. 4.6 Dip and Declination
4.7 Accessories required for compass surveying, 4.8 Traverse - closed and open traverse 4.9 Computation of bearings of legs of closed traverse given the bearing of one of the legs, 4.10 Computation of included angles given the bearings of legs of a closed traverse.

6 Hours

PART – B

UNIT 5:

Compass Traversing *continued....*

5.1 Local attraction, determination and corrections, 5.2 Dependent and independent co-ordinates, 5.3 Checks for closed traverse and determination of closing error and its direction 5.4 Bowditch's graphical method of adjustment of closed traverse, 5.5 Bowditch's rule and transit rule, 5.6 Omitted measurements (Only Length and corresponding bearing of one line).

8 Hours

UNIT 6:

Introduction to Levelling

6.1 Principles and basic definitions, 6.2 Fundamental axes and part of a dumpy level, 6.3 Types of adjustments and objectives, 6.4 Temporary adjustments of a dumpy level, 6.5 Sensitiveness of bubble tube, 6.6 Curvature and refraction correction, 6.7 Type of leveling, 6.8 Simple leveling, 6.9 Reciprocal leveling, 6.10 Profile leveling, 6.11 Cross sectioning, 6.12 Fly leveling,

7 Hours

UNIT 7:

Reduction of Levelling continued....

7.1 Booking of levels 7.2 Rise and fall method and Height of instrument method 7.3 comparison Arithmetic checks 7.4 Fly back leveling., 7.5 Errors and precautions.

6 Hours

Contouring

7.6 Contours and their characteristics, 7.7 Methods of contouring, 7.8 direct and indirect methods, 7.9 Interpolation techniques, 7.10 Uses of contours 7.11 Numerical problems on determining intervisibility, 7.12 Grade contours and uses.

4 Hours

UNIT 8:

Plane Table Surveying

8.1 Plane table and accessories, 8.2 Advantages and limitations of plane table survey, 8.3 Orientation and methods of orientation, 8.4 Methods of plotting – Radiation, Intersection, Traversing, 8.5 Resection method, 8.6 Two point and three point problems, 8.7 Solution to two point problem by graphical method, 8.8 Solution to three point problem Bessel's graphical method, 8.9 Errors in plane table survey.

5 Hours

TEXT BOOKS:

1. 'Surveying' Vol-1 – B.C. Punmia , Laxmi Publications, New Delhi.
2. **Surveying and Levelling** – R Subramanian. Oxford University Press (2007)

Text Book of Surveying – C. Venkataramiah. Universities Press.(2009 Reprint)

.

REFERENCE BOOKS:

1. **Fundamentals of Surveying** - Milton O. Schmidt – Wong, Thomson Learning.
2. **Fundamentals of Surveying** - S.K. Roy – Prentice Hall of India.

3. **Surveying** Vol. I, S.K. Duggal, Tata McGraw Hill - Publishing Co. Ltd., New Delhi.

* Survey of India Publication on maps.

10 CV 35 FLUID MECHANICS

Sub. Code: 10CV 35

IA Marks: 25

Hrs/Week : 04

Exam Hours: 03

Total Hrs: 52

Exam Marks: 100

PART-A

UNIT-1: BASIC PROPERTIES OF FLUIDS

Introduction, Definition of Fluid, Systems of units, properties of fluid: Mass density, Specific weight, Specific gravity, Specific volume, Viscosity, Cohesion, Adhesion, Surface tension, & Capillarity. Newton's law of viscosity (theory & problems). Capillary rise in a vertical tube and between two plane surfaces (theory & problems). **06 Hrs.**

UNIT-2: PRESSURE AND ITS MEASUREMENT

Definition of pressure, Pressure at a point, Pascal's law, Variation of pressure with depth. Types of pressure. Vapour pressure. Measurement of pressure using a simple, differential & inclined manometers (theory & problems). Introduction to Mechanical and electronic pressure measuring devices. **07 Hrs.**

UNIT-3: HYDROSTATIC PRESSURE ON SURFACES

Basic definitions, equations for hydrostatic force and depth of centre of pressure for Vertical and inclined submerged laminae (plane and curved)- Problems. **06 Hrs**

UNIT-4: KINEMATICS OF FLOW

Introduction, methods of describing fluid motion, definitions of types of fluid flow, streamline, pathline, streamtube. Three dimensional continuity equation in Cartesian Coordinates (derivation and problems). General Continuity equation (problems). Velocity potential, Stream function, Equipotential line, Stream line- problems, Physical concepts of Streamfunction. Introduction to flow net.

07 Hrs

PART-B

UNIT-5: DYNAMICS OF FLUID FLOW

Introduction, Energy possessed by a fluid body. Euler's equation of motion along a streamline and Bernoulli's equation. Assumptions and limitations of Bernoulli's equation. Problems on applications of Bernoulli's equation (with and without losses). Introduction to kinetic energy correction factor. Momentum equation problems on pipe bends.

07 Hrs

UNIT-6: PIPE FLOW

Introduction, losses in pipe flow,. Darcy-Weisbach equation for head loss due to friction in a pipe. Pipes in series, pipes in parallel, equivalent pipe-problems. Minor losses in pipe flow, equation for head loss due to sudden expansion- problems. Water hammer in pipes, equation for pressure rise due to gradual

valve closure & sudden closure for rigid and elastic pipes-
problems. **07 Hrs**

UNIT-7: DEPTH AND VELOCITY MEASUREMENTS

Introduction, Measurement of depth, point & hook gauges, self recording gauges. Staff gauge, Weight gauge, float gauge. Measurement of velocity- single and double gauges, pitot tube, Current meter- Problems.

06 Hrs

UNIT-8: DISCHARGE MEASUREMENTS

Introduction, Venturimeter, Orificemeter, Rotometer, Venturiflume, Triangular notch, Rectangular notch, Cipolletti notch, Ogee weir and Broad crested weir, Small orifices-
Problems. **06 Hrs**

TEXT BOOKS:

1. 'A TextBook of Fluid mechanics & Hydraulic Machines'- R.K.Rajput, S.Chand & Co, New Delhi, 2006 Edition.
2. 'Principles of Fluid Mechanics and Fluid Machines'- N.Narayana Pillai, Universities Press(India), Hyderabad,2009 Edition.
3. ' Fluid Mechanics and Turbomachines' - Madan Mohan Das, PHI Learning Pvt. Limited, New Delhi. 2009 Edition.

REFERENCE BOOKS:

1. ' Fundamentals of Fluid Mechanics' – Bruce R. Munson, Donald F.Young, Theodore H. Okiishi, Wiley India, New Delhi, 2009 Edition.
2. 'Introduction To Fluid Mechanics' – Edward j. Shaughnessy,jr; Ira m. Katz.; James p Schaffer, Oxford University Press, New Delhi, 2005 Edition.

3. 'Text Book Of Fluid Mechanics & Hydraulic Machines'-
R.K.Bansal, Laxmi Publications, New Delhi, 2008
Edition.
4. 'Fluid Mechanics' – Streeter, Wylie, Bedford New Delhi,
2008(Ed)

* * * * *

APPLIED ENGINEERING GEOLOGY

Sub Code	: 10 CV-36	IA Marks	: 25
Hrs/ Week	: 04	Exam Hours	: 03
Total Hrs.	: 52	Exam Marks	: 100

PART – A

Unit: 1 - INTRODUCTION:

Geology and its role in the field of civil engineering. Earth: Its internal structure and composition. – 2 hours

MINERALOGY:

Description and identification of Rock forming minerals and Ores, based on physical and special properties;

Quartz and its varieties; Feldspar group; Mica group; carbonate group;

Hornblende, Augite, Olivine, Asbestos, Kaolin, Talc, Gypsum, Garnet, Corundum.

Magnetite, Hematite, Limonite, Pyrite, Chalcopyrite, Pyrolusite, Psilomalane, Chromite, Galena, Bauxite. – 6 hours

Unit: 2- PETROLOGY:

Rocks as fundamental units and building materials of the earth crust and their engineering applications: As building stones, road metals and stones for decoration, pavement, cladding, roofing, flooring, concreting and foundation engineering.

Igneous rocks: Origin, classification (chemical and textural), mode of occurrence; Identification and description of Granite, Syenite, Diorite, Gabbro, Dunite; Pegmatite, Porphyries, Dolerite; Rhyolite, Basalt and Pumice.

Sedimentary rocks: Origin, classification, primary structures and description of Sandstones, Conglomerate, Breccia, Shale, Limestones and Laterite.

Metamorphic rocks: Kinds of metamorphism, description of Gneiss, Quartzite, Marble, Slate, Phyllite and Schists. – 6 hours

Unit: 3-GEOMORPHOLOGY:

Epigene and Hypogene geological agents; rock weathering and its types; Soil formation, types, erosion and remedial measures; Geological action of rivers with different drainage patterns; Geological action of wind. – 5 hours

Unit: 4-GEODYNAMICS:

Earthquakes- seismic waves, seismograph, causes, effects, seismic zones, shield areas and seismic resisting structures. Coastal zones, coastal landforms, continental shelf, continental rise, continental slope, abyssal plain, mid-oceanic ridges, trenches, tsunamis. Land slides; causes, effects and remedial measures – 5 hours

PART B

Unit: 5- ROCK MECHANICS:

Stress, strain and deformational effects on different rocks; Out crop, Dip, strike and escarpment, Clinometer-compass- Joints, faults, folds and unconformities their effects on civil engineering structures. – 6 hours

Unit:6- ENGINEERING GEOLOGY:

Geotechnical investigations for civil engineering projects: Study of toposheets and geological maps, importance of lithological and structural features studies for the construction of Dams, Reservoirs, Tunnels, Bridges and Highways – 6 hours

Unit: 7-HYDROGEOLOGY:

Hydrological cycle; distribution of ground water in the earth crust; properties of water bearing geological formation: Aquifers and their types; selection of sites for well locations and spacing of wells; geological, hydrological and geophysical (electrical resistivity) investigations for ground water exploration; artificial recharge of groundwater methods and rain water harvesting. Sea water intrusion and remedial measures. – 9 hours

Unit:8- GEOMATICS AND ENVIRONMENTAL GEOLOGY:

Introduction to remote sensing (RS), geographical information system (GIS) and global positioning system (GPS); land satellite imageries, stereoscopes and their applications in civil engineering. Impact of quarrying, mining and dams on Environment. Quality of ground water in different geological terrain. – 7 hours

QUESTION PAPER PATTERN:

Question paper shall be consisting of eight full questions, selecting four from each part.

The student has to answer any five, selecting at least two from each part.

Each question carry 20 marks.

References books:

1. Text book of Geology by P.K. Mukerjee, World Press Pvt. Ltd. Kolkatta.
1. Foundations of Engineering Geology, by Tony Waltham (3rd Ed.) Universities Press.
2. Structural Geology (3rd Ed.) by M. P. Billings, Published by Prentice Hall of India Pvt. Ltd. New Delhi
3. Text of Engineering and General Geology by Parbin Singh, Published by S. K. Kataria and Sons, New Delhi.
4. Rock Mechanics for Engineers by Dr B.P. Verma, Khanna Publishers, New Delhi.
5. Engineering Geology for Civil Engineering by D. Venkata Reddy, Oxford and IBH Publishing Company, New Delhi.
6. Ground water geology by Todd D.K. John Wiley and Sons, New York.
7. Remote sensing Geology by Ravi P Gupta, Springer Verlag, New York.
8. Physical Geology by Arthur Holmes, Thomson Nelson and Sons, London.
9. Environmental Geology by K. S. Valdiya, Tata Mc Graw Hills.
10. A text book of Engineering Geology by Chenna Kesavulu, Mac Millan India Ltd.
11. Remote sensing and GIS by M. Anji Reddy.
12. Ground water assessment, development and management by K.R. Karanth, Tata Mc Graw Hills

**BASIC MATERIAL TESTING LAB
(COMMON TO CV/TR)**

Sub Code	:	10 CVL 37	IA Marks	:	25
Hrs/ Week	:	03	Exam Hours	:	03
Total Hrs.	:	42	Exam Marks	:	50

1. Tension test on Mild steel and HYSD bars.
2. Compression test of Mild Steel, Cast iron and Wood.
3. Torsion test on Mild Steel circular sections
4. Bending Test on Wood Under two point loading
5. Shear Test on Mild steel.
6. Impact test on Mild Steel (Charpy & Izod)
7. Hardness tests on ferrous and non-ferrous metals – Brinell’s, Rockwell and Vicker’s
8. Test on Bricks and Tiles
9. Tests on Fine aggregates – Moisture content, Specific gravity, Bulk density, Sieve analysis and Bulking
10. Tests on Coarse aggregates – Absorption, Moisture content, specific gravity, Bulk density and Sieve analysis
11. Demonstration of Strain gauges and Strain indicators

NOTE: All tests to be carried out as per relevant BIS Codes

REFERENCE BOOKS:

1. **Testing of Engineering Materials**, Davis, Troxell and Hawk, International Student Edition – McGraw Hill Book Co. New Delhi.
2. **Mechanical Testing of Materials**”, Fenner, George Newnes Ltd. London.
3. **“Experimental Strength of Materials”**, Holes K A, English Universities Press Ltd. London.
4. **“Testing of Metallic Materials”**, Suryanarayana A K, Prentice Hall of India Pvt. Ltd. New Delhi.
5. **Relevant IS Codes**
6. **“Material Testing Laboratory Manual”**, Kukreja C B- Kishore K. Ravi Chawla Standard Publishers & Distributors 1996.
7. **Concrete Manual**, M.L.Gambhir –Dhanpat Rai & Sons- New Delhi.

Scheme of Examination:

Group Experiments: Tension, Compression Torsion and Bending Tests
Individual Experiments: Remaining tests

Two questions are to be set – one from group experiments and the other as individual experiment.

**SURVEYING PRACTICE – I
(COMMON TO CV/TR/EV/CTM)**

Sub Code	:	10 CVL 38	IA Marks	:	25
Hrs/ Week	:	03	Exam Hours	:	03
Total Hrs.	:	42	Exam Marks	:	50

Exercise – 1

- a) To measure distance between two points using direct ranging
- b) To set out perpendiculars at various points on given line using cross staff, optical square and tape.

Exercise – 2

Setting out of rectangle, hexagon using tape/chain and other accessories

Exercise – 3

Measurement of bearing of the sides of a closed traverse & adjustment of closing error by Bowdich method and Transit method

Exercise – 4

To set out rectangles, pentagon, hexagon, using tape /chain and compass.

Exercise – 5

To determine the distance between two inaccessible points using chain/tape & compass.

Exercise – 6

To locate points using radiation and intersection method of plane tabling

Exercise – 7

To solve 3-point problem in plane tabling using Bessel's graphical solution

Exercise – 8

To determine difference in elevation between two points using fly leveling technique & to conduct fly back leveling. Booking of levels using both HI and Rise & Fall methods.

Exercise – 9

To determine difference in elevation between two points using reciprocal leveling and to determine the collimation error

Exercise – 10

To conduct profile leveling for water supply /sewage line and to draw the longitudinal section to determine the depth of cut and depth of filling for a given formation level.

Demonstration

Minor instruments – Clinometer, Ceylon ghat tracer, Hand level, Box sextant, Planimeter and Pantagraph.

Scheme of Examination:

Any one of the above exercise is to be conducted in the examination by the student.

TEXT BOOKS:

1. **'Surveying'** Vol.-1, B.C. Punmia , Laxmi Publications, New Delhi.
2. **"Plane Surveying"** Vol-1-A.M. Chandra , Newage International ® Ltd.
3. **'Plane Surveying'** – ALAK , S. Chand and Company Ltd., New Delhi.

REFERENCE BOOKS :

1. **Fundamentals of Surveying** - S.K. Roy – Prentice Hall of India.
2. **Fundamentals of Surveying** - Milton O. Schmidt – Wong, Thomson Learning.
4. **Surveying** Vol. I, S.K. Duggal