

DIPLOMA (CIVIL) – PART FIVE

Optional Early Certificate: - Certificate (Civil)

Syllabus:-

Sr. No.	Module Code	Name of Module	Credits	Total Marks
1	MC25-21	English - III	5	100
2	MC25-22	Surveying & Leveling - II	5	100
3	MC25-23	Design of Steel Structures	5	100
4	MC25-24	Hydraulics & Hydraulic Machines	5	100
5	MC25-25	Civil/Architecture Engineering Drawing – II	5	100

Module Name: English-III

- The Seven C's of the Effective Communication:** Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness.
- Communication:** Its interpretation: Basics, Nonverbal Communication, Barriers to Communication.
- Business Communication at Work Place:** Letter Components and Layouts, Planning a letter, Process of Letter writing, Email Communication, Memo and Memo Reports, Employment Communication, Notice Agenda and Minutes of Meeting, Brochures.
- Report Writing:** Effective Writing, Types of Business Reports, Structure of Reports, Gathering Information, Organization of the Material, Writing Abstracts and Summaries, Writing Definitions, Visual Aids, User Instruction Manual.
- Required Skills:** Reading Skills, Note-making, Précis Writing, Audio Visual Aids, Oral Communication.
- Mechanics of Writing:** Transitions, Spelling Rules, Hyphenation, Transcribing Numbers, Abbreviating Technical and Non-Technical Terms, Proof Reading.

Module Name: Surveying & Leveling -II

- 1. Contouring:** Concepts of Contours, Purpose of Contouring, Contour interval and Horizontal equivalent, factors effecting contour interval characteristics of Contours, Drawing Cross section from a Contour map: Marking alignment of a road, railway and a canal on contour map, Computation of earth work and reservoir Capacity from a Contour map.
- 2. Theodolite Surveying:** Working of a transit venire axes of a theodolite and their relation; temporary adjustments of a transit theodolite; Concept of transiting, swinging, face left, face right and Changing face; plotting a traverse; concept of coordinate and solution of omitted Measurements (one side affected), error in theodolite survey and Precautions taken to minimize Them; Limit of Precision in theodolite traversing.
- 3. Techno-metric Surveying:** Tachometry, Instruments to be used in tachometry, methods of tachometry, stadia system of tachometry, general principle of stadia tachometry, examples of stadia Tachometry.
- 4. Curve:** Introduction, why we study Minor Instrument? Abney Level, Testing of Abney Level, Adjustment of Abney Level, Testing of Tangent clinometers, Tracing or Laying the Grade contour, Measuring a Slope, Pantographs, reducing a plane, Advantage of Box Sextant, Zero Circle.
- 5. Aerial Surveying:** Introduction, Why we do Aerial Surveying, Photographic Surveying, Question for Self Evaluation.

Module Name: Design of Steel Structures

Units 1: Railway Engineering

1. Introduction
2. Permanent Way
3. Rails
4. Sleepers
5. Ballasts
6. Fixtures and fastenings
7. Track Geometrics
8. Points and Crossing
9. Track Construction
10. Railways Stations and Yards
11. Signaling and Interlocking
12. Track Maintenance

Unit 2: Bridge Engineering

1. Introduction
2. Site Selection and Investigation
3. Bridge Foundations

4. Piers, Abutments, Wing Walls & Approaches
5. Bridge Bearing
6. Temporary Bridge
7. Permanent Bridge
8. Bridge Construction and Maintenance

Unit 3: Tunnel Engineering

1. Introduction
2. Tunnel Investigations and Surveying
3. Tunneling and Lining
4. Ventilation and Drainage of Tunnels

Module Name: Hydraulics and Hydraulic Machines

1. **Introduction:** Fluid: Real Fluid, Ideal Fluid, Fluid Mechanics, Hydraulics, Hydrostatics, Hydrokinematics and Hydrodynamics.
2. **Properties of Fluids:** Mass Density, Specific Weight, Specific Gravity, Cohesion, Adhesion, Viscosity, Surface Tension, Capillary, Vapour Pressure and Compressibility, Units of Measurement.
3. **Hydrostatic Pressure:** Pressure, Intensity of Pressure, Pressure Head, Pascal's Law and its Applications, Total Pressure, Resultant Pressure, and Center of Pressure, Total Pressure and Center of Pressure on Vertical and Inclined Plane Surfaces: Rectangular, Triangular, Trapezoidal, Circular, Total Pressure on Dams and Lock Gates.
4. **Measurement of Pressure:** Atmospheric Pressure, Gauge Pressure, Vacuum Pressure and Absolute Pressure, Piezometers, Simple Manometer, Differential Manometer and Mechanical Gauges, Measurement of Pressure by Manometers and Pressure Gauges.
5. **Fundamentals of Fluid Flow:** Types of Flow: Steady and Unsteady Flow, Laminar and Turbulent Flow, Uniform and Non Uniform Flow, Discharge and Continuity Equation (Flow Equation), Types of Hydraulic Energy: Potential Energy, Kinetic Energy, Pressure Energy, Bernoulli's Theorem: Statement and Description (without Proof of Theorem).
6. **Orifice:** Definition of Orifice, and Types of Orifice, Hydraulic Coefficients, Large Vertical Orifices and Small Orifices, Free Drowned and Partially Drowned Orifice, Time of Emptying a Rectangular/Circular Tanks with Flat Bottom.
7. **Flow Through Pipes:** Definition, Laminar and Turbulent Flow, Explain Through Reynolds Experiment, Reynolds Number, Critical Velocity and Velocity Distribution, Head Lose in Pipelines Due to Friction, Sudden Expansion and Sudden Contraction, Entrance, Exit, Obstruction and Change of Direction (No Derivation of Formulae), Flow From One Reservoir to Another Through Long Pipe of Uniform and Composite Section, Water Hammer Phenomenon and its Effects (Only Elementary Treatment), Pipes in Series and Parallel, Syphon.

- 8. Flow Through Open Channels:** Definition of a Channel, Uniform Flow and Open Channel Flow, Discharge Through Channels Using: (a) Chezy's Formulae (No Derivation), (b) Manning's Formulae, Most Economical Sections: (a) Rectangular, (b) Trapezoidal, (c) Circular.
- 9. Flow Measurements:** Measurement of Velocity by Pitot-Tube, Current Meter, Surface Float, Velocity Rods, Measurement of Discharge by a Notch: (a) Difference between Notches and Orifices, (b) Discharge Formulae for Rectangular Notch, Triangular Notch, Trapezoidal Notch and Conditions for their use (No Derivation), Measurement of Discharge by Weirs: (a) Difference between Notch and Weir, (b) Discharge Formulae for Free Drowned and Broad Crested Weir With and Without end Contraction, Velocity of Approach and Condition of Their Use, (c) Venturi Fumes to Measure Flow, Measurement of Discharge by Velocity Area- Method.
- 10. Hydraulic Machines:** Reciprocating Pumps, Centrifugal Pumps, Impulse Turbines, Reaction Turbines, Sketching and Description of Principles of Working of Above Mentioned Machines.

Module Name: Civil / Architecture Engineering Drawing - II

1. Introduction
2. Sanitary Engineering
3. Surface Drains & Sewers
4. Traps, Manholes & Inspection Chamber
5. Septic Tanks & Soak Pits
6. House Drainage & Sanitary Fittings
7. Irrigation Engineering
8. Wells & Tube Wells
9. Canals
10. Irrigation Outlets, falls and Cross Drainage Works