

**DIPLOMA (CIVIL) – PART THREE**

**Optional Early Certificate:** - Basics of Technology

**Syllabus:-**

Sr. No.	Module Code	Name of Module	Credits	Total Marks
1	MC25-11	English –II	4	100
2	MC25-12	Building Construction	5	100
3	MC25-13	Civil/Architectural Engineering Drawing - I	5	100
4	MC25-14	Concrete Technology	4	100
5	MC25-15	Highway Engineering	4	100

**Module Name:** English-II

- Functional Grammar:** Articles, Preposition, Tenses: Functions, Synthesis, Transformation, Spotting errors and correction of sentences.
- Pre- Requisites of Technical written Communication:** One word substitution, Spelling rules, Words often confused & misused, Phrases.
- The Structure of sentences/ clauses:** Adverb clause, Adjective clause, Noun clause. Sentences: Simple, Double, Multiple and complex, Transformation of sentences: simple to complex & vice versa, simple to compound & vice-versa, Interrogative to assertive & to negative & vice-versa.
- Technical Communication:** Nature, Origin and Development, Salient features, Scope & Significance, Forms of Technical Communication, Difference between Technical Communication & General writing, Objective Style vs. Literary Composition.

**Module Name:** Building Construction

- Foundation:** Purpose, shallow & deep foundation, Sketches for spread footing & isolated column footing.
- Plinth:** Plinth filling material and their representation. Introduction to load & R.C.C. frame structure including beams, column, slab, chajja, lintel etc. with their general size and placements.

3. **Carpentry Joints:** Meaning of term, technical terms, classification etc.
4. **Floor:** Purpose, mezzanine floor, stilt floor, basement floor (introduction only).
5. **Lintels:** Purpose, types, general size, terminology.
6. **Arches:** Purpose, types & applications.
7. **Brick masonry:** English bond, Flemish bond, precautions to be taken in bonding, king closer, queen closer, bat and application.
8. **Stone Masonry:** Rubble masonry, Ashlar masonry, introduction to artificial stone and uses, stone finishes.
9. **Door and Windows:** Types of door & windows with their applications.
10. **Structures in Brick Work:** Footing, Piers, etc.

**Module Name:** Civil/Architecture Engineering Drawing – I

1. **Basic Concepts of Drawing :** Introduction, requirements of Good Drawing, Role of Presentation, Lines and Line Work, Drawing Instrument and Aids, Line Work and Lettering, Original Drawing, Scale Dimensioning Engineering Drawing, Lettering [ is 9609 (part 0): 2001 and sp46 : 2003].
2. **Construction of Geometric Figures: The** Construction of Geometric Figures Given Data, The Triangle, The Quadrilateral, Polygons, The Construction of Circle to Satisfy Given Condition.
3. **Projections :** Introduction, 3-D Projections, Multi-view Projections, Working Drawings, Orthographic Projections, Types of Projection, First angle Projection, Third Angle Projection, Projection of Points, Projection of Lines, The Blending of Lines and Curves, Conic Section-The Ellipse, The Parabola, the Hyperbola, The Ellipse, the Parabola, The Hyperbola.
4. **Basic Concepts of Drawing :** Introduction, Prisms, Pyramids, Solids of Revolution , Frustums and truncated solids, Prisms, Reference Planes, Pyramids, Application of Orthographies Projections, Fillet Curve.
5. **Isometric Projection:** Isometric Projection, Freehand Sketching.
6. **Further Problem:** Further Problems, Areas of Irregular Shapes.

**Module Name:** Concrete Technology

1. **Concrete :** Concrete as a Structural Material, Good Concrete Manufacture of Portland Cement, Chemical Composition of Cement, Hydration of Cement, Heat of Hydration and Strength, Tests on Cement and Cement Paste- Fineness, Consistency, Setting Time, Soundness, Strength.
2. **Portland Cement:** Types of Portland Cement Ordinary, Rapid Hardening, Low-heat, Sulphate Resisting, Portland Slag, Portland Pozzolana, Super Sulphate Cement, White Cement.
3. **Aggregates :** Classification, Mechanical and physical Properties, Deleterious Substance, Alkali-Aggregate Reaction, Sieve Analysis, grading Curves, Fineness Modules, grading requirements. Testing of Aggregates -Flakiness, Elongation Tests, Aggregate Crushing Value, Impact Value and Abrasion Value.

4. **Properties of Fresh Concrete** : Workability, Factors Affecting Workability, Slump Test Compacting Factors Test, Kelly Ball Test, Flow Table Test, Segregation, Bleeding, Setting Time, Mixing and Vibration of Concrete, Methods, Maturity.
5. **Strength of Concrete** : Water/ Cement ratio, Gel/Space ratio, Strength in Tension, Compression, Effect of Age on Strength, Relation Between Compressive and Tensile Strength, Fatigue Strength, Shrinkage and Creep, Compression Test on Cubes, Cylinders, Non-Destructive Tests.
6. **Admixtures**: Different Types of Admixtures, Effects, User, Retarders and Super Plasticizers.

**Module Name:** Highway Engineering

1. **Highway Planning**: An Overview: History of roads Transport, Nagpur, Bombay and Lucknow Plan, Highway Classification, Administration of Roads, Financing Roads Survey, route Design Surveys and Selection of Highway Alignment, Drainage Studies, Soil Survey, highway Project Report Preparation.
2. **Geometric Design** : Road User Characteristics, Vehicle Characteristics, Function Classification of Roads, Topography, Design Speed, Traffic Volume, Composition and Capacity of Road, Cross-Section of a road, Horizontal Curves, Sight Distance, Intersections.
3. **Pavement Material** : Soils, Soil Compaction, Aggregate, Pavement Courses, Types of Binders,, Bitumen's, Cement concrete for Pavement, Concrete Mix Design.
4. **Pavement Design**: Types of Pavement, Desirable Properties of Pavements, Flexible and rigid Pavement, Factors Influencing Design, Methods of Pavement Design, Temperature and other Stresses, Design of Joint Plain Concrete Slabs, Overlay Design for Flexible and Rigid Pavement.
5. **Construction and Maintenance of Roads** : Embankment construction, Compaction, Construction Equipment, Soil Stabilization, Construction Methods, Granular Sub-Base and Bases, Open Textured Carpet, Dense bituminous Concrete, Highway Maintenance.