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DIPLOMA (CIVIL) – SECTION B

Group A +							
S.N	**Code**	**Name of Module**	**CR**	**SN**	**Code**	**Name of Module**	**CR**
1	MC25-11	English-II	**4**	2	MC25-12	Building Construction	**5**
3	MC25-13	Civil /Architectural Engineering Drawing-I	**5**	4	MC25-14	Concrete Technology	**4**
5	MC25-15	Highway Engineering	**4**	6	MC25-16	Transportation Engineering	**4**
7	MC25-17	Surveying & Leveling-I	**5**	8	MC25-18	Soil Mechanics & Foundation Engineering	**5**
9	MC25-19	Design of RCC Structures	**4**	10	MC25-20	Irrigation Engineering	**4**

Subject Name: English-II

1. **Functional Grammar:** Articles, Preposition, Tenses: Functions, Synthesis, Transformation, Spotting errors and correction of sentences.
2. **Pre- Requisites of Technical written Communication:** One word substitution, Spelling rules, Words often confused & misused, Phrases.
3. **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.
4. **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.

Subject Name: Building Construction

1. **Foundation:** Purpose, shallow & deep foundation, Sketches for spread footing & isolated column footing.
2. **Plinth:** Plinth filling material and their representation. Introduction to load & R.C.C. frame structure including beams, column, slab, chaijja, 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.

Subject 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.

Subject 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.

Subject 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 ofa 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.

Subject Name: Transportation Engineering

1. **Introduction to Transportation Engineering:** Introduction to Transportation, Formation of Settlements, Mode of Transportation, Basic Premise of a Transportation System, Major Disciplines of Transportation.
2. **Geometric Design and Transportation Planning:** Geometric Design, road Classification, Width of Pavement of Carriageway, Transport Planning, The urban Transportation Planning Process (UTPP), Trip Generation.
3. **Traffic Management:** Regulation of Traffic, Public Transport, Count Data Processing, Distribution, Poisson distribution, Normal Distribution, Linear Regression, Road Accident Scenario, Factors Causing Accidents, Prevention of Accidents, Cost of Road Accidents, Parking Traffic Signals and Traffic Signs.
4. **Pavement Design, Construction and Maintenance of Road:** Pavement Design, Road Construction, Soil Stabilization, highway Maintenance, Maintenance System.
5. **Transport Economic and Other Modes of Transportation Engineering:** Transport Demand and Supply, Cost of Producing Transport Services, Pricing of Transport Services, Methods of Economic Analysis, Role of Railways, An Overview of Air Transportation, Rapidly changing Technology Water Transportation.

Subject Name: Surveying & Leveling-I

1. **Introduction:** Surveying and Leveling, Objects of Surveying, Uses of Surveying, Classification of Surveying, General Principles of Surveying, Stages of Survey Operation, Scale, Types of Scale, Type of Vernier.
2. **Chain Surveying:** Introduction, Methods of Direct Measurements, Instruments used for Chaining, Ranging of Line, Testing and Adjustment of Chain, Degree of Accuracy in chaining, Methods of Chaining on slopping ground, chain and tape corrections, obstacles in chaining, solved examples, Errors in chaining, Electronic distance measurements, Geodimeter, Tellurometer,
3. **Chain Triangulation:** Introduction, Terms related to chain triangulation, Equipment for chain surveying, Field Book, Field Work, Instruments for setting out right angles, Conventional Symbols.
4. **Compass Surveying:** Introduction, Traversing, Principle of Compass surveying, basic definitions, calculation of included angles from bearing, calculation of bearings from included angles.
5. **Plane Table Surveying:** Principle of plane table survey, Instruments required for plane table survey, Temporary Adjustments of Plane table, Methods of Plane table surveying, Advantages and disadvantages of plane table survey.
6. **Levelling:** Object of leveling, uses of leveling, Basic definitions, Instruments used, Temporary adjustments of level, classification of leveling.
7. **Theodolite:** Introduction, Types of theodolite, Size of theodolite, Basic Definition, Some modern theodolites, The fundamentals lines of theodolite.

Subject Name: Soil Mechanics & Foundation Engineering

1. **Nature of Soil:** Problems with soil, Phase relation in soil, Classification for engineering purpose, Soil Compaction, Field compaction methods and monitoring.
2. **Soil water and water Flow:** Soil water, Influence of Clay minerals, Effective stress Concepts in Soil, Darcy's law Permeability measurement in the laboratory, introduction to flow nets.
3. **Stress Distribution in Soil:** Stress Distribution, Westergaard's Solution, Compression and Consolidation of Soils, Normally Consolidated and Over-Consolidated clays, Analysis of Consolidation-Terzaghi's theory.
4. **Shear Strength of Cohesive :** Shear strength of Cohesive and Cohesion less soils, Mohr Coulomb failure theory, Measurement of shear strength, Direct shear, tri axial Compression, Drained and Untrained Behaviors of Clay and sand, Stress path for Conventional Triaxial test.

5. **Slope Stability:** Slope failure Mechanisms, total and effective stress analysis, Stability analysis for purely cohesive and C soils, Method of Slices, Taylor's Stability number, slope Protection Measures.
6. **Foundation:** Well Foundation or Caisson Foundation, Machine Foundation, Loads in Foundation, Bearing Capacity of the Soil, Causes of Failures of Foundations, Requirement of Good Foundations.

Subject Name: Design of RCC Structures

1. Details of reinforcement in a simply supported RCC beam (singly reinforced and doubly reinforced) with the given design data regarding the size and number of bars, stirrups their size and spacing.
2. Details of reinforcement for a RCC square and circular column with isolated square footing.
3. Details of reinforcement for a cantilever beam with given data regarding the size of the beam and the reinforcement.
4. Details of reinforcement in plan and section for a simply supported RCC one way slab with intermediate support and two-way slabs from the given data. Bar bending schedule should be prepared.
5. Details of reinforcement in a two storeyed RCC internal and corner column. In this, the details of reinforcement at the junction with beams must be shown from the given design data.
6. Details of reinforcement of the junction of a secondary beam with the main beam with the given data.

Subject Name: Irrigation Engineering

1. **Introduction of Irrigation:** Definition, Necessity and Scope of Irrigation, Multipurpose River Valley Project, Benefits of Irrigation, Ill-Effects if Irrigation, History of Irrigation.
2. **Methods of Irrigation:** Modes or Methods of Applying water to crops, Uncontrolled or Wild Flooding, Free Flooding, Flooding by Contour Laterals, Border strip Flooding Method, Check flooding, Ring Basin Flooding, Zigzag and Furrow methods, Drip Irrigation.
3. **Water Requirement of Crops:** functions and Quality of Irrigation water, Types of Soils, Classes and Availability of Soil Water, Principal Crops and Crop Seasons, Duty and Delta, factors Affecting Duty, Soil Fertility Crop Rotation.
4. **Ground Water: Well Irrigation:** Definition of Aquiculture and Aquifuge, Divisions of Sub-Surface Water, Types of Aruifers, Tube Wells Other Sources of Under Ground Water.
5. **DAMS:** According to hydraulic Design, According to Material, Gravity Dams, Arch Dams, Buttress Dams, Timber Dams, Earth and Rock fill Dams, Selection of Site for a Dam.
6. **Flow Irrigation:** Canals Classification, Canal Alignment, Curves, Inundation Canals, Bandhara Irrigation.
7. **Water Logging:** Effects of Water Logging, causes of water logging, Remedial Measures, losser in Canal, Land Drainage.
8. **River Engineering:** Classification of River, Meandering, Causes of Meandering, the Aggrading Type of river, Cut off, River Training.
9. **Water Resources Planning:** India's Water Resources, Scenario of Water Use, Purpose of Water Resource Development Classification of Water Resource Development Projects, Strategies for the Future, Planning Strategies, Management Strategies.