

**Syllabus**  
**Draftsman Grade III (Civil) in NDMC & MCD**

**1. Introduction:**

- Importance of safety and general precautions observed in the industry.
- Familiarization & information about rules and regulations of Trade.
- List of the Instruments, equipment and materials.

**2. Importance of B.I.S.**

- Introduction of Code for practice of Architectural and Building Drawings (IS: 962- 1989, SP-46:2003).
- Operating system, Hardware & software, CAD, 3D modeling concept in CAD, 3D coordinate systems to aid in the construction of 3D objects.
- Layout of drawings, Lines, Lettering, Dimensioning etc.
- Knowledge of different types of scales.
- Different types of projection views: Orthographic, Isometric, Oblique and Perspective.

**3. Characteristic, types and uses of Materials:-**

- Stones, Bricks, Lime, Pozzolanic Cement, Sand, Clay products (types, earthenware, stoneware, porcelain, terracotta, glazing), Mortar & Concrete (Types, uses, preparation, proportion, admixtures and applications).
- Timber (Types, Structure, disease & defects, characteristics, seasoning, preservation and utility). Alternative material to Timber (Plywood, Block board, Particle board, Fire proof Reinforced Plastic (FRP), Medium density fibreboard (MDF) etc.), Tar, bitumen, asphalt etc.
- Protective materials:- Paints, Varnishes, Metal and Plastics etc.

**4. Building Construction:-**

- Sequence of construction of a building, different parts of building; Stone masonry (Terms, use and classification), Principles of construction, composite masonry, Strength of walls, Strength of masonry; Brick masonry – principles of construction of bonds; Tools and equipments used.
- Foundation:- Purpose of foundation, Causes of failure of foundation, bearing capacity of soils, dead and live loads, examination of ground, types of foundation, drawing of footing & foundation setting out of building on ground, excavation, simple machine foundation.
- Types of shoring, scaffolding, underpinning and timbering etc.
- Carpentry joints, doors, windows, ventilators etc.
- Floors, Flooring, Stairs, lift and Escalator etc.
- Roofs & Roof coverings, Truss, Shell, Dome etc.
- House drainage of building:- Introduction, terms used in PHE, Systems of sanitation, System of house drainage, plumbing, sanitary fittings etc. Types of sewer appurtenance, Systems of plumbing, Manholes & Septic tank, Water treatment plant, Sewerage treatment plant.
- Prefabricated Structure: Method of construction and assembling.

- Concepts of design of earthquake resisting buildings – requirements, resistance, safety, flexible building elements, special requirements, base isolation techniques.

## 5. Treatments of building structures:-

- DPC, Sources and effects of dampness, Method of prevention of dampness in building, Damp proofing materials, Anti-termite treatment, Weathering course, Fire proofing, Arches, Lintel (types, wooden, brick, stone, steel & RCC), Chajjahs, Centering & Shuttering.

## 6. Surveying:-

- Introduction, History and principles of chain survey, Instruments Classification, accuracy, types, Main divisions (plane & geodetic), Chaining, Mouza Map, Compass survey, Plane table survey.
- Levelling:- Auto level, dumpy Level, Tilting Level, Principle of levelling, Types, component / part and function, Datum, Focusing & parallax, Deduction of levels / Reduced Level, Types of leveling, Application to chain and Levelling Instrument to Building construction.
- Contouring:- Definition, Characteristics, Methods, Interpolation of Contour, Contour gradient, Uses of Contour plan and Map.
- Introduction to Theodolite survey.
- Modern and advanced surveying instruments.

## 7. Electrical Wiring: -

- Safety precaution and elementary first aid, Artificial respiration and treatment of electrical shock, Elementary electricity, General ideas of supply system, Wireman's tools kit, Wiring materials, Electrical fittings, System of wirings, Wiring, installation for domestic lightings.

## 8. Building Bye-Laws:-

- Principle of planning, Objectives & importance Function & responsibility, Orientation, Local building Bye-Laws as per IS code, Lay out plan & key plan, composition of drawing, Provisions for safety, Requirement of green belt and land, Economy & orientation, Provision for lighting, ventilation, drainage and sanitation.
- Types of building, planning & designing of residential, public and commercial building.
- Parks & play ground- Types of recreation, landscaping etc.

## 9. Reinforced cement concrete structure:-

- Introduction to RCC, Uses, Materials, Formwork, Bar bending details as per IS Code, Reinforced brickwork, Materials used for RCC Construction.
- Selection of materials – Coarse aggregate, fine aggregate, cement, water and reinforcement Characteristics. Method of mixing concrete, Slump test.

- Structure – Columns, beams, slabs - one-way slab & two-way slab. Innovative construction, Safety against earthquake, Grade of cement, steel- behaviour and test, Bar-bending schedule, Retaining wall, R.C.C. Framed structure.
- Steel structures:- Structural fasteners, Joints. Tension & compression member, Classification, fabrication, Construction details.

#### 10. Roads:-

Introduction, General principles of alignment, Classification and construction of different types of roads, Component parts, Road curves, gradient. Curves-types, designation of curves, Setting out simple curve by successive bisection from long chords, simple curve by offsets from long chords, Road drainage system, Basics of Bridges & Culvert.

#### 11. Irrigation and water resources:-

- Basic terms used in Irrigation, Hydrology like duty, delta, base period, intensity of irrigation, hydrograph, peak flow, run off, catchment area, Cultivable Command Area, crops like, rabi, kharif etc.
- Storage, diversion, head work - Characteristics and types.
- Reservoir – Types of reservoirs, i.e., single purpose and multi-purpose, area, capacity and curves of reservoir.
- Dams, weir & barrages - Types and purposes.
- Canals- classification and distribution system, canal structures etc.
- Types of cross drainage works like Aqueduct, Super passage, Syphon, Level crossing, inlet and outlet, etc.

#### 12. Estimating and Costing:-

- Introduction; Purpose and common techniques, Drawing of construction, Measurement techniques etc..
- Estimate - Necessity, importance. Types - approximate and detailed estimate - main and sub estimates, revised, supplementary, maintenance/repair estimate - taking off quantities method. Rate analysis of typical items and their specifications, Labor and materials, Govt. Schedule of rate, Estimating of irregular boundaries by trapezoidal and Simpsons formula.