Syllabus for Draftsman

(Syllabus is only Indicative. The questions can assess any aspect of knowledge, aptitude, attitude and practical skills, which is expected from a trained person to work efficiently at the advertised post)

PART B

Core Subject

1. **Introduction:**

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

2. **Importance of B.I.S.**
   - Introduction of Code for practice of Architectural and Building Drawings
   - (IS: 962- 1989, SP-46:2003).
   - Layout of drawing. Lines, Lettering, Dimensioning.
   - Knowledge of different types of scale. Principle of R.F.
   - Different types of projection views: Orthographic, Isometric, Oblique, and Perspective.

3. **Concepts of Engineering Drawings**
   - Drawing Instruments and Accessories - Role of Engineering Drawing, Drawing Board, Mini Draughter, Instrument Box, Set of Scales, French Curves, Templates, Pencils
   - Lettering and Dimensioning Practices - Drawing Sheet, Lettering, Dimensioning, Arrangement of Dimensions
   - Scales - Reducing and Enlarging Scales, Representative Fraction, Types of Scales
   - Geometrical Constructions - Conic Sections like Circle, Ellipse, Parabola, Hyperbola and Conic Sections as Loci of a Moving Point, Curves
   - Orthographic Projections
   - Isometric Projection

4. **Computer Aided Design and Drawing (CADD)**: -
   - Operating system, Hardware & software, CAD,3D modeling concept in CAD, 3D coordinate systems to aid in the construction of 3D objects, Basic Working Knowledge of AutoCad, Commands and Concepts of 2D Drawings in Auto CAD such as polygons, circle, arcs, parabola,

curves, ellipse, scale, layers, area volume etc.

5. 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),
- Protective materials: - *Paints*, Varnishes, Metal and Plastics

6. Building Construction: -

- Sequence of construction of a building, different parts of building, Stonemasonry (Terms, use and classification), Principle of construction, composite masonry, Strength of walls, Strength of masonry, Brick masonry – principles of construction of bonds, Tools and equipment's 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
- Carpentry joints, Doors, Windows, Ventilators
- Floors, Flooring, Stairs, lift, and Escalator
- Roofs & Roof coverings, Truss, Shell, Dome, Roof & coverings
- 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
- Arches, Lintel (types, wooden, brick, stone, steel &RCC), Chajjahs, Centering& Shuttering

7. 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 Focussing & 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.

8. Building: -

- Principle of planning, Objectives &importance Function & responsibility, Orientation, Local building Bye-Laws as per ISI 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 &playground-Types of recreation, landscaping etc.

- Prefabricated Structure: Method of construction and assembling.

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.
- Steel structures: -Structural fasteners, Joints, Tension & compression member, Classification, fabrication, Construction details.
- IS Codes of RCC, Steel.

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.
- Basics of Bridges & Culvert.

11. Irrigation Engineering: -

- Dams, weir & barrages- types purposes.
- Hydroelectric projects like Forebay ,Penstock, Turbines, Power house, etc.
- Canals- classification and distribution system, canal structures.
- Methods of Irrigation.

12. Estimating and Costing: -

- Introduction, Purpose, and common techniques, Drawing of construction, Measurement techniques.
- 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 item sand their specifications, Labor and materials, Govt. Schedule of rate.