GROUP-26

Draughtsman Civil Jobs (Level- Matric+ Diploma in Draughtsman civil)

1) General awareness, Reasoning, Mathematics, Science, History including Haryana related history, current affairs, literature, Geography, Civics, Environment, Culture etc.- **(Weightage 20%)**

2) Computer terminology, Fundamentals, word software, excel software, Power point, internet, web browsing, Communication, emails, downloading and uploading data on websites etc**. -**
(Weightage 10%)

3) Subject related syllabus- **(Weightage 70%)**

Importance of safety and general precautions observed in the in the industry/shop floor, working of Industrial Training Institute system including stores procedures. Soft Skills: its importance andJob area after completion of training, Introduction of First aid, Introduction of PPEs, Introduction to 5S concept& its application, Response to emergencies e.g.;power failure, fire alarm, etc.

Familiarisation& informationabout rules and regulations of the Institute and Trade, List of the Instruments, equipment's and materials to be used during training.

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 typesof scale. Principle of R.F.

Materials:

Stones: –characteristics, types & uses, Bricks –. Manufacturing, characteristics of good bricks, types,uses and hollow bricks, Lime– characteristics, types, manufacturing &its uses, Pozzolanic: - characteristics, types & uses, Cement: – Manufacturing, characteristics, types, uses and test of good cement, Different types of projection views: Orthographic, Isometric, Oblique and Perspective.

Building materials: -

Sand: -characteristics,types&uses, Clay Products: – types,earthenware, stoneware, porcelain, terracotta, glazing, Mortar& Concrete: –Types,uses, preparation, proportion, admixtures and applications, Timber: - Types, Structure, disease & defects, characteristic, seasoning, preservation and utility, Alternative material to Timber, Plywood, Block board, Particle board, Fireproof reinforced plastic (FRP), Medium density fireboard (MDF) etc. Tar, bitumen, asphalt: -Properties, application and Uses, Protective materials: -Paints: - characteristic, types, uses,Varnishes: – characteristics and uses, Metal: – characteristic, types, uses, Plastics: – characteristic, types, uses.

Building Construction: -

Sequence of construction of a building, Name of different parts of building, Stone masonry:Terms, use and classification, Principle of construction, composite masonry, Strength of walls, Strength of masonry, Brick masonry – principles of construction of bonds, Toolsand 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 and scaffolding in details, Types of Underpinning and Timbering in detailTreatments of building

structures: - DPC Sources and effects of dampness, Method of prevention of dampness in building

Damp proofing materials –properties, function and types.

Anti-termite treatment –objectives, uses and applications.
Arches: - Technical terms-types,centring

Lintel: -types,wooden, brick, stone, steel & RCC.

Chajjahs – characteristics, Centring& Shuttering

Carpentry joints: - terms,classification of joints,Uses, types of fixtures, fastenings.

Doors –Parts, Location, standard sizes, types.

Windows-types, Ventilators-purpose-types.

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, Wiringmaterials, Electrical fittings, System of wirings. Wiring, installation for domestic lightings.

Floors – Ground floor & upper floor-Types, flooring- materials used Types

Stairs: - Terms, Requirements,Planning and designing of stair and details, of construction.

Basic concept of lift andEscalator

Roofs & Roof coverings: –purposes,Elements, Types, Fla, pitched, Truss-king post, queen post, mansard, bel-fast, steel, composite.

Roof & coverings –objectives, types & uses.

Surveying:-Introduction, History and principles of chain survey, Instrument employed, Use, care, maintenance andcommon terms, Classification, accuracy, types, Main divisions (plane & geodetic), Chaining, Speed in field and office work, Knowledge of Mouza Map,

Compass survey: - Instrument and it's setting up, Bearing and each included angle of close traverse, Local attraction, Magnetic declination and itstrue bearing, Precaution in using prismatic compass.

Plane table survey: - Instrument used in plane table survey, Care and maintenance of plane table

Levelling: - Auto level, dumpy Level,Tilting Level - introduction, definition, Principle of levelling, Levelling staffs, itsgraduation & types, Minimum equipment required, Types,component / part and function, Temporary and permanent, adjustment, procedure in setting up, Level& horizontal surface, Datum Benchmark,Focussing& parallax, Deduction of levels / Reduced Level, Types of levelling, Application to chain and Levelling Instrument to Building construction.

Contouring; -Definition, Characteristics, Methods, Direct and Indirect methods, Interpolation of Contour, Contour gradient, Uses of Contour plan and Map, Knowledge on road project,

Theodolite survey: - Introduction, Types of theodolites, Uses, Methods of Plotting, Transit vernier theodolite, Terms of transit theodolite, Fundamental line oftheodolite, Adjustment of theodolite, Checks, Adjustment of errors, Open and closed traverse and their application toEngineering Problems, Vernier scale- types, Measurement of horizontal angle, Measurement of vertical angle, Adjustment of a close, traverse, Problems in transit, theodolite-departure, latitude, northing andeasting.

WORKSHOP CALCULATION & SCIENCE:

Unit, Fractions, Classification of unit system, Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units, Measurement units and conversion, Factors, HCF, LCM and problemsFractions - Addition, subtraction, multiplication & division, Decimal fractions - Addition, subtraction, multiplication& division, solving problems, square root, Ratio and Proportions, Percentage, Square and square root, Simple problems using calculator, Applications of Pythagoras theorem and related problems, Ratio and proportion, Ratio and proportion - Direct and indirect proportions, Percentage, Percentage - Changing percentage to decimal and fraction, Centre of gravity - Centre of gravity and its practical application, Area of cut out regular surfaces and area of irregular surfaces, Area of cut out regular surfaces - circle, segment and sector of circle, Related problems of area of cut out regular surfaces - circle, segment and sector of circle Area of irregular surfaces and application related to shop problems, Algebra - Addition , subtraction, multiplication & division, Theory of indices, algebraic formula, related problems, Elasticity - Elastic, plastic materials, stress, strain and their unitsand young's modulusElasticity - Ultimate stress and working stress, Profit and loss - Simple problems on profit & loss, Simple and compound interest, Estimation and costing - Simple estimation of the requirement of material etc., as applicable to the trade, Estimation and costing - Problems on estimation and costing

Material Science

Types metals, types of ferrous and nonferrous metals, Physical and mechanical properties of metals, Introduction of iron and cast iron, Difference between iron & steel, alloy steel and carbon steel, Properties of timber, Mass, Weight, Volume and Density, Mass, volume, density, weight and specific gravity, Heat & Temperature and Pressure, Concept of heat and temperature, effects of heat, difference,

between heat and temperature, boiling point & melting point of different metals and non-metalsScales of temperature, Celsius, Fahrenheit, kelvin and conversion, between scales of temperature, Heat &Temperature - Temperature measuring instruments, types of thermometer, pyrometer and transmission of heat - Conduction, convection and radiationCo-efficient of linear expansion and related problems.

Mensuration

Area and perimeter of square, rectangle and parallelogram, Area and perimeter of Triangles, Area and perimeter of circle, semi-circle, circular ring, sector ofcircle, hexagon and ellipse, Surface area and volume of solids - cube, cuboid, cylinder, sphere, and hollow cylinder, Finding the lateral surface area, total surface area and capacity in litres of hexagonal, conical and cylindrical shaped vessels

Trigonometry

Measurement of angles, Trigonometrical ratios, Trigonometrical tables, Application in calculating height and distance (Simple applications)

Building: -

Principle of planning, Objectives & importance, Function& responsibility, Orientation, Local building Bye-Laws asper ISI code, Lay out plan & key plan, Submitted in compositionof drawing, Provisions for safety, Requirement of green belt and land, Computer aided drafting: -Operating system,Hardware& software, Introduction of CAD, Its Graphical User Interface, Method of Installation, Basic commands of CAD, Knowledge of Tool icons and set of Toolbars, Knowledge of shortcut keyboard commands, Building Planning:-Economy & orientation, Provision for lighting andventilation, Provision for drainage and sanitation, Types of building, Planning & designing of residential , public and commercial building, Prefabricated Structure:-Preparation, Method of construction, assembling, Advantages & disadvantages, 3D modelling concept in CAD, 3D coordinate systems to aid in the construction of 3D objects, Knowledge of shortcut keyboard commands, Parks &play ground-Typesof recreation, landscaping, etc. Concepts of design ofearthquake resisting buildings- requirements resistance, safety, flexible building elements, special requirements, base, isolation techniques, Reinforced cement concrete

structure: -

Introduction to RCC uses, Materials – proportions, Form work, Bar bending details as per IS Code, Reinforced brick work, Materials used for RCC:-Construction, Selection of materials –coarse aggregate, fine aggregate, cement water and reinforcement, Characteristics, Method of mixing concrete – machine mixing and hand mixing, 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: -

Conmen forms of steelsections, Structural fasteners, Joints, Tension & compression member, Classification, fabrication, Construction details, House drainage of building: -Introduction, Terms used in PHE, Systems of sanitation, System of house drainage, plumbing, sanitary fittings, etc.

Types of sewers

Appurtenance, Systems of plumbing, Manholes & Septic tank, Water treatment plant, Sewerage treatment plant

Roads: -

Introduction, History of highway development, 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.

Bridges & Culvert: -

Introduction to bridges, Component parts of bridge, Classification of culverts, IRC loading, Selection of type and location, Factors governing theideal site, Alignment of bridge, Foundation – selection, caisson, Coffer dam- types, Types of super structure, Substructure-piers,abutments, wing walls, Classification of bridge.

Tunnels- rules used for the sizes of different members.

Irrigation Engineering: -

Terms used in irrigation, Hydrology like duty, delta, base period, intensity of irrigation, Hydrograph, peak flow, run off, catchment area, CCA, corps like, rabi, kharifetc. Storage, diversion headwork - characteristics and types, Reservoir –types of reservoirs, i.e., single purpose and multipurpose, area, capacity, and curves of reservoir, Dams, weir & barragestypes purposes, Hydroelectric project like, Forebay, Penstock, Turbines, Power house, etc.Canals- classification and distribution system, canal structures, Types of cross drainage, works like Aqua duct, Super passage, Syphon, Level crossing, inlet and outlet, etc.

Estimating and Costing: -

Introduction, Purpose and commontechniques, drawing of construction, Measurement techniques, Estimate-necessity, importance, types, approximate and detailed estimate-main and sub estimates, revised, supplementary, maintenance / repairestimate-taking off quantities- method, Rate analysis of typical items and their specifications, Labour and materials, Govt. Schedule of rate, Estimating of irregular, boundaries by trapezoidaland Simpsons formula,

Total Station: -

Introduction, Components parts, accessories used, characteristics, features, advantages and disadvantages, principle of EMD, Working and need, Setting and measurement, Electronic, display & Data reading, Rectangular and polar coordinate system, Terminology of open andclosed traverse

GPS (Global PositioningSystem): -

Introduction of GPS system, Co- ordinate and timesystem, Satellite and conversional geodetic system, GPS. Signal, code, and biases, Role of TRANSIT in GPS Development, GPS segment organisation, GPS survey methods. Basic geodetic co-ordinate, Ground supportequipment, signals, Tracking devises& system, Time measurement and GPS timing.

Important Note: The Weightage as mentioned against the syllabus is tentative & may vary.