

**FURTHER DETAILS REGARDING MAIN TOPICS OF
PROGRAMME No. 11/2019 (Item No.13)**

**WORKSHOP ATTENDER
(ARCHITECTURAL ASSISTANT)**

(SR FROM SC/ST)

INDUSTRIAL TRAINING

(CategoryNo.389/2017)

1. Engineering Drawing and AUTOCAD:

Lettering, Construction of plain geometrical figures (lines, angles, triangles, rhombus, quadrilaterals, polygons, ellipse, parabola, hyperbola etc). Projection of solids in simple positions (pyramid, prism, cylinder, cone, sphere, cube). Projection of solids in Inclined positions (pyramid, prism, cylinder, cone, sphere, cube) Isometric projection of different objects, combination of objects including furniture etc version of orthographic projection to isometric projection and vice versa.

AUTOCAD: Initial sketches/preliminary drawings in CAD

2. Workshop science and calculation:

Application of fractions and decimals to trade problems. Ratio and proportion units - different system and conversion Algebra - simple equation, problems involving trade Units of mass, force, weight and simple problems Mensuration: Problems related to triangles, rectangles, square, circle, regular polygons etc Trigonometrical ratios, functions - applied problems, height and distance Calculation on volume and weight of simple solid bodies

MASONRY:

Definition, classification, properties and uses of brick Characteristics of good brick. Sizes of brick.

English and Flemish bond- for half brick thick and one brick thick wall. Tools and equipment used in Brick masonry. Stone masonry Coarsed and uncoarsed rubble and random rubble masonry Ashlar chamfered masonry. Technical terms Principles of stone masonry Classification of stone masonry.

Lime - Definition, classification, properties and uses of lime Surkhi - Definition and uses Sand - Definition, uses and classification. Cement - Definition, composition, types, properties and uses Mortar - Definition, function, types, uses and proportion of mortar Concrete - Definition, proportions, properties and uses, Grades (M20, M15, M35 etc.)

FOUNDATION AND DPC:

Types of foundation (pile, raft, spread, mat, column, retaining wall). **Foundation** Purpose, causes of failure of foundation, bearing capacity of soils, dead load, live load Types of foundation (pile, raft, spread, mat, column, retaining wall). **DPC:** Sources of dampness Effects of dampness Method of prevention of dampness in building Periodic repair and care for prevention Anti termite treatment.

Floors& Flooring roof & roof coverings, Color wheel, Color schemes and Paints etc :-

Floors: Components of floor Ground and basement floor **Flooring:** Types and its laying process (terrazzo, concrete, granite, marble, tiles, rubber, wooden) **Roof and roof coverings:** Pitched roof , flat roof, lean to roof Materials used for roofing like asbestos sheet, terracotta tiles, AC sheets, corrugated sheets etc **Color:** Definition of color Qualities of color Color wheel Properties of color Methods of pencil use Pencil grades. **Paint** – types, characteristics and procedure Polishing – types, characteristics and procedure (lacquer, melamine, deco, French polish, poly urethane polish)

Doors, Windows, Arches, Lintels, Stairs, Timber and Carpentry Joints:

Doors: Details of Paneled door, flush door, batten and ledged door. Types of doors. Size of doors Door frame. **Windows:** Classification of windows. Size of window. Basement window, louvered window, ventilator and its details. Hard wood and soft wood Defects in timber Characteristics of common Indian timber (Sal, deodar, teak, chir, kail, neem). **Arches:** Types of arches (flat arch, semi circular arch, segmental arch) Technical terms Classification of arches **Lintels:** Materials used for construction Lintels Purpose and types (wooden lintels, brick lintel, stone lintel, reinforced concrete lintel, steel lintel). **Stairs:** Technical terms used Materials used for different types of stairs Planning and design of a stair Details of construction of various stairs. Classification of timber joints.

Water supply system, Sanitation and drainage, Mechanical services, Rain water harvesting, Estimation, Bending moment and shear force, Theory of RCC beams / slabs, Design of beams and columns:

Water supply: Average water consumption for various building Water distribution in a domestic building, sanitation Terms used in Public Health Engineering. **Sanitation and drainage:** System of sewerage - one pipe system, two pipe system, single stack system, anti syphonage pipe Types of traps Sanitary fitting - WV, urinals, sinks, WCs Septic tank and storm water drainage Sewage treatment - primary treatment, secondary treatment. **Mechanical services:** HVAC - window unit, split unit, duct able unit, chilled beam system Lifts and escalators Firefighting services **Rain water harvesting:** Purpose, advantages, system set up and various process. **Estimation:** Introduction Standard methods of calculating quantities - centre line method, in to in - out to out method Types of estimate Performa's used in estimate Abstract cost Material statement Unit of measurement. **Preparation of Detailed estimate:** Excavation Footings Super structure Concrete works (lintel, beam, column, slab) Roofing - flat roof Flooring Doors and windows Plastering and painting. **Rate analysis and Specifications:** Specifications - importance, objectives Rate analysis of items (concrete, brick work,

wood work, plastering, flooring) including rates of Labour and materials, sundries, contractors profit etc as per standards. **Bending moment and shear force:** Types of beams - cantilevers, simply supported and overhanging beams Types of loads - concentrated, U.D.L and uniformly increasing loads Calculation of B.M and S.F for simply supported, cantilever and overhanging beams subjected to concentrate and UDL only. **Theory of RCC beams - singly reinforced:** Simple bending assumptions. Flexible strength of aq single reinforced RCC beam Neutral axis Concept of balanced section, under reinforced section, over reinforced section Shear strength of single reinforced RCC beams Assumptions made in single reinforced RCC beams. Bonds in RCC beams / slabs Property of bonds, minimum length of embedment of bars Bond length anchorage as per IS specification. **Design of beams and columns.**

Surveying and Levelling:

Chain Survey Testing of chain, direct ranging, indirect ranging, degree of accuracy. Compass surveying Prismatic compass, surveyors compass, advantages and disadvantages Plane table survey General, instrument used, advantages and disadvantages, orientation, methods used. Levelling. Introduction in levelling Types of levelling and levelling staff Terms used in levelling Booking and reduction levels. Total survey station Components used in total survey station Advantages of total survey station Electronic notebook.

NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper