## (iii)TRADE : ARCHITECTURE

12th VOCATIONAL

PAPER-I

### ENGINEERING DRAWING - II

### THEORY

Time :2hrs

Theory : 30Marks

InA : 10 Marks

Practical : 50 Marks

Total : 90Marks

**Pictorial Drawing**

Introduction of Projection, Types - Pictorial and Orthographical Projection, Difference between First Angle Projection and Third Angle Projection, Introduction of Isometric Projection, Isometric Drawing, and Isometric Scale.

### *Sections*

Introduction Types of Sections - Full Section, Half Section, Offset Section, Broken Section.

### *R.C.C Design*

Introduction of Beam, Types of Beam - Simply Supported Beam, Fixed Beam, Overhanging Beam, Cantilever Beam, Continuous Beam, Factor affecting the Bending Moment of Beam, Types of load on Beam, Introduction of Single and Double Reinforced Beam, Introduction of Slab, Types of Slab - One Way and Two Way Slab, Introduction of R.C.C. Column - Square and Circular, Definition of Long and Short Column, R.C.C. Lintel and R.C.C Chajjha, Form Work for different R.C.C Work, Requirements for good Form Work, Comparison of Steel Form Work with Wooden Form Work.

### *Foundation*

Introduction, Objectives, Types - Shallow Foundation, Spread Footing Foundation, Grillage Foundation, Raft Foundation, Stepped Foundation, Deep Foundation - Pile and Well Foundation, Cause of Failure, Bearing Capacity of Soil, Safe Bearing Capacity of Soil.

### *Brick Masonry*

Introduction of Bricks, Types of bricks - Burnt Clay Bricks, Hollow Bricks, Fire Bricks, uses of bricks, Characteristics of good bricks, technical terms - Header, Stretcher, Bat, Closer, King Closer, Queen Closer, Course, Joints, Lap, Classification of - brick masonry Bond, English and Flemish, Stecher, Header and Diagonal bond, Basket Weave Bond .

## *Water Supply and Sewerage System*

Introduction of Water Supply Engineering, Layout of Canal System, Classification - Fully in Cutting, Partly Cutting and Partly in Filling, Fully in Filling, Technical term - Sewer, Sewage, Sullage, Storm Sewer, Sewerage , Traps and its types, Ventilating Pipe, Waste Pipe, House Connection, Inspection Chamber, Introduction of Open Drain, Types - Semi circular Drain, Rectangular, V-Shaped, U- Shaped, Types of Sewer - Circular, Egg-Shaped, Semi circular, Rectangular.

**Commands of Auto CAD (2D)** – Introduction, Basic Commands

## *ENGINEERING DRAWING - II*

**Time:3hrs** **PRACTICAL** **Marks :50**

- Draw the drawing sheet of Isometric drawing/ projection of Square, Rectangle, Circle, Triangle, Cube, Cylinder and Cone.
- Draw the drawing sheet of Isometric drawing/ projection of Simple Blocks.
- Draw the drawing sheet of Orthographic drawing/ projection of Simple Blocks.
- Draw L and cross section of Different size of Single Reinforced Beam.
- Draw L and cross section of Different size of Double Reinforced Beam.
- Draw cross section of Cantilever Beam.
- Draw plan and cross section of R.C.C Slab.
- Draw plan and cross section of R.C.C Column.
- Draw plan and cross section of R.C.C Lintel.
- Draw important brick masonry bond, English Bond, Flemish Bond, Stretcher Bond, Header Bond, Diagonal Bond, Basket Weave Bond. (Plan, Elevation , Section)
- Draw section of Spread footing foundation of different foundation sizes.
- Draw section of Raft foundation.
- Draw section of Grillage Foundation.
- Draw section of Stepped Foundation.
- Draw section of pile and well foundation
- Draw cross section of Open Drains-Semi Circular, Rectangular, V-Shaped, U-Shape.
- Draw cross section of Sewers- Circular, Egg-Shaped, Semi circular, Rectangular.
- Draw cross section of different types of Gully and FloorTraps.

- Draw layout of Canal System.
- Draw the cross section of different Canal.
- Layout of Building working out material quantity calculations.
- Draw any 5 Sheets on AutoCAD listed above.

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## PAPER-II WORKSHOP PRACTICE - II THEORY

**Time :2hrs**

**Theory : 30Marks**
**InA : 10 Marks**
**Practical : 50 Marks**
**Total : 90Marks**

**Surveying**

Introduction of Survey Division of Surveying, Instruments used for Taking Measurements, Basic Principles of Surveying, Classification of Survey – on the basis of Purpose, Area, Instrument and Methods.

### *Chain Survey*

Introduction, Instruments - Chain, Metric Chain, Gunter Chain, Revenue Chain, Engineer Chain, Arrows, Tapes Ranging Rods, Offset Rods, Pegs, Direct and Indirect Methods of Chaining, Error in Chaining, Chaining on Sloping and Flat Ground, Chain Lines - Base Line, Check Line, Tie Line, Numerical Related to Chaining, Recording of Field Book.

### *Leveling*

Introduction, Objective, Principles, Level & their Types - Dumpy Level, Tilting Level and Y Level, Leveling Staff - Telescopic Staff, Folding Staff, Target Staff, Invar Staff, Technical Terms used in Leveling, Adjustments of the Level, Finding the Difference of Level of TwoPoints, Level Book, Errors in Leveling and their Prevention - Rise and Fall Method, Height of Collimation Method.

### *Plane Table Survey*

Introduction, Advantages and Disadvantages, Instrument Used - Drawing Board, Drawing Sheet, Alidade, Tripod Stand, Spirit Level, Trough Compass, U-Folk, Waterproof Cover, Setting up and Working of Plane Table, General Instructions for Plane Table Surveying, Errors in Plane Tabling Method - Radiation, Re-Section, Inter-Section, Traversing.

### *Contouring*

Contour & Contouring, Characteristics, Contour Intervals, Horizontal Equivalent, Direct and

Indirect Methods of Contouring - Radial Line Method, Cross - Section Method, Square Method, Use of Contour Maps.

# WORKSHOP PRACTICE - II

**Time:3hrs** **PRACTICAL** **Marks :50**

- Folding and unfolding of chain.
- Adjustment/ Correction of the Length of Chain.
- Ranging a line for measuring the correct length of Survey Line.
- Chaining a line for measuring the Survey Area.
- Setting of Dumpy level to check the level of different points.
- Find the difference in elevation between far points.
- Setting of plane Table to prepare the plan of Survey Area.
- Draw a plan by Radiation method of Plan Table Survey.
- Draw a plan by Traversing method of Plane Table Survey.
- Drawing of contour sheets.

# TRADE :
# ARCHITECTURE

## 12th VOCATIONAL

## PAPER-III CONSTRUCTION MATERIAL AND ESTIMATE

### THEORY

Time :2hrs

Theory : 30Marks

InA : 10 Marks

Practical : 50 Marks

Total : 90Marks

**Bricks and Tiles**

Introduction of Bricks , Ingredients of Good Bricks, Weight and Size of Standard Bricks, Characteristics of Good Bricks , Manufacturing of - Preparation of Earth, Moulding, Drying Burning of Bricks, Classification of Bricks, 1st Class, 2nd Class, 3rd Class, Tiles - Introduction of Tiles, Roofing Tiles, Wall Tiles and FloorTiles, Concrete Blocks & Hollow Blocks.

### *Cement and Lime*

Ingredients, Types – Natural, Artificial - Ordinary Cement, Early Strength Cement, Quick Setting Cement, Colored Cement and Low Heat Cement, Manufacturing of Cement - Dry and Wet Process, Flow Chart of Cement Manufacturing, Characteristics of Ordinary Cement, Precautions for Storage of Cement, Introduction of Lime, Types of Limes - Quick Lime, Hydrated Lime, Fat Lime, uses of Lime,

### *Filler Material*

Introduction of Filler Material, Requirements of Good Filler Material, Sand and its Types - Fine and Course Sand, Characteristics of Good Sand, Bulking of Sand, Surkhi and its uses, Coarse Aggregate and uses of Coarse Aggregate.

### *Timber*

Introduction of Important Indian Timber - Kail, Shisham, Deodar, Sal, Teak, Characteristics of Good Timber, Uses of Timber, Defects in Timber - Knots, Shakes, Twisted Grains, Rind Gall, Unsettled Grains, Seasoning of Timber - Natural, Water and Kiln Seasoning, Preservation of Timber By - Tarring, Painting and Polishing.

### *Building Estimates*

Introduction of Estimates Types of Estimate - Approximate, Cubical Content, Plinth Area, Detailed, Revised, Maintenance Estimate, Standard Method - Centre Line Method, Separate Wall Method of Taking out Estimate of Quantity, Labour and Material, Numerical about Estimate of Single Room, Analysis of Rates For Simple Items of Works, Specifications - Detail and Brief Specifications.

# CONSTRUCTION MATERIAL AND ESTIMATE

**Time:3hrs** **PRACTICAL** **Marks :50**

- Water absorption test of bricks of different class bricks
- Crushing strength test of bricks of different class bricks
- Shape and size test of bricks
- Fineness test of Cement to check the grinding of different grades of cement.
- Consistency test of Cement to check the water content for good mixture of cement.
- Soundness test of Cement to check the quantity of Lime in Cement.
- Test of Sand to check the silt content in Sand.
- Test of Sand for bulking of Sand
- Shape and Size test of different types of Aggregate.
- Identification of important IndianTimber.
- Market survey regarding Availability of different materials and their substitutes with approximate costing.
- Preparation of rough Estimates for single storey building.