

**DRAUGHTSMAN (CIVIL) (ITI STANDARD)**  
**NATIONAL TRADE CERTIFICATE**

**UNIT 1: BASIC ENGINEERING DRAWING**

**Engineering Drawing:**

State the importance of engineering drawing, State the areas of civil engineering drawing.

**List of drawing instruments, equipments and materials to be used during training:**

State instruments, equipments and materials, List out instruments, equipments and materials, State the standard as per 962-1987, To use different drawing instruments, equipments and materials, Follow precautions in the use of instruments, equipments and materials.

**Layout of drawing Sheet:**

State the system of layout of drawing sheet, List the different layout for designated drawing sheet Explain the title block.

**Folding of drawing Sheet:**

State the purpose of folding a drawing sheet, Explain the method of folding for drawing sheet

**UNIT 2: GEOMETRICAL CONSTRUCTION:**

**Plane Geometrical construction:**

Define the terms of most commonly used geometrical shapes

**Types of Lines and Angles:**

Define points and lines, State the classification of lines, State the different types of angles, Explain the method of measuring angles.

**Triangles and their types:**

Define triangles, Name the different types of triangles and state their properties.

**Quadrilaterals and their properties:**

Define a quadrilateral, Name the quadrilaterals, State the properties of quadrilaterals

**Polygon and their properties:**

Define Polygon, Name the Polygon in terms of the number of sides, State the properties of polygon.

**UNIT 3: CHAIN SURVEYING**

**Introduction - History and principles of chain survey and instrument & employed**

Define surveying, Explain the classification of Surveying, Narrate different methods of measurements, Express the instruments used for chain surveying.

**Introduction about chain survey instruments**

State the construction and uses of the chain survey instruments

**Testing of metric chain (20m/30m)**

State the necessity of checking the chain, State the methods of testing, List out then errors in the chain, State the limits of error in chain, Explain the adjust the chain, State Indian optical square

**Measurement of distance by chain and chaining**

State chaining and chaining a line, State unfolding the chain, Describe the reading the chain, State folding the chain, Calculate the errors in chaining

**UNIT 4: COMPASS SURVEYING****Identification and parts of instruments in compass survey:**

State about traversing, State types of compass, Name the prismatic compass and construction, Construction of survey's compass

**Determining the bearing of a given triangular plot of ABC and calculation of included angles:**

Calculate angles from bearing, Calculate bearing from angles

**Determining the bearing of a given pentagonal plot of ABCDE and calculation of included angles**

Calculate angles from bearings for a closed traverse, Calculate bearing from angles for a closed traverse, Calculate bearing of a pentagon

**Magnetic declination and local attraction**

Define the dip of the Magnetic needles, State the magnetic declination and variations, Calculate true Bearing, State local attraction and its elimination, Explain about errors and limits, State the testing the prismatic compass

**UNIT 5: PLANE TABLE SURVEYING****Instrument used in plane table surveying:**

State plane tabling, Name the instruments and accessories used in plan tabling, State the construction and uses of instruments and accessories used in plan tabling, Explain about leveling, centering and orientation in plain tabling, Explain the methods of plain tabling

**Resection method of plane table survey:**

State the resection method of plane table survey

**UNIT 6: LEVELLING****Types of levelling:**

Name the various types of levelling, Explain simple levelling, Explain differential levelling, Complete the reduced levels of points.

**UNIT 7: ROAD ENGINEERING - I:****Introduction to road engineering:**

Define road, Define highway engineering, Define necessity and characteristics of road

**Technical term used in road engineering:**

Define road and Total Station advantage, Define various terms used in road engineering, Describe the various advantages of road

**Principle of road alignment:**

Alignment of road, Express the principle of highway alignment, Explain the different survey required for alignment

**Classification of roads:**

Describe the different classification of roads

**UNIT 8: ROAD ENGINEERING II:****Road Margins:**

Define road margin, Describe the element Total Station of road margin

**Camber, super elevation, sight distance and gradient:**

Define camber, Explain super elevation, sight distance and express gradient

**UNIT 9: TOTAL STATION****Introduction to total station:**

Get introduced to the Total station, Learn the evaluation of Total station from the convectional equipmen Total Station, Explain the benefit Total Station and uses of Total station

**Types of total station:**

Explain the advantages and disadvantages of Total station, Explain the types of Total Station, Explain the precautions to be taken while using Total Station

**Measurement with total station:**

Explain the equipment required for Total Station surveying, Explain the procedure of measurement with Total Station

**Characteristics and features of total station:**

Define the features of Total Station, State the characteristics of Total Station, Advantages and disadvantages of Total Station

**Principle of EDM- Working need setting and measurement Total Station:**

Define EDM, State the principle of EDM, Features of EDM

**Setting and measurement Total Station:**

Define distance measuring, State principal of EDM, State classification of EDM

**Total station Prism- instrument error operation:**

Explain Total Station prisms, Describe sources of error in EDM, EDM instrument operation, Uses of EDM

**Electronic display and data recording:**

Define electronic data recording, Explain field computers, Define recording module, Internal memories

**Rectangular and Polar Co-ordinate system:**

Illustrate rectangular and polar coordinates

**UNIT 10: GLOBAL POSITIONING SYSTEM****Introduction of GPS:**

Explain GPS coordinate system, Describe Geographic latitude and longitude, GPS equipment

**Satellite and Conventional Geodetic system:**

What is satellite system, Define Geodetic system

**GPS coordinate system and component Total Station of GPS & System segment Total Station:**

Explain GPS coordinate system, Describe Geographic Latitude and Longitude, Explain and describe component Total Station GPS receiver

**GPS segment Total Station:**

Define GPS segment

**Principle of Operation of GPS and surveying with GPS:**

State the Principle of Operation of GPS, Describe the role of transit in GPS

**Remote sensing:**

Explain Remote sensing, Distinguish between GPS, GIS and Total Station

**GPS signal code - GPS basics:**

Introduction to digital signal, Explain data acquisition system, Describe signal processing, Explain code an basics

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