ANNEXURE-II

Subject Code:387

Paper-I (Objective Type)

SURVEYOR (ITI STANDARD)
NATIONAL TRADE CERTIFICATE

Unit-1: Basic Engineering Drawing

Role of Surveyor:
Know about the role of a surveyor - State the importance of survey.

Layout of drawing sheets and title block:
State the measuring of the term 'Layout' of drawing sheet - List the different layout styles of drawing sheets - Explain margin, frame, title block etc.

Free hand sketching:
State the need free hand sketching - List the situations wherein free hand sketching is useful.

Drawing equipment - Drawing board, T-Square:
State the construction and use of drawing boards and 'T' square - State the standard sizes of drawing board as per IS:1444-1989 - State the standard sizes of 'T' square as per IS: 1360-1989 - State the construction and uses of drafting machine - Select the pencil grades for different drawing application - Select the purpose of erasing shield - State the use of set squares in drawing work.

Folding of sheets:
Explain the method of folding in different size of drawing sheets.

Lettering styles:
Recognise different lettering styles - Designate the letters and numerals as per IS norms - State standard properties for height, width and spacing of letters.

Scales:
State the necessity of scales - Explain representative fraction (RF) - List the types of scales - Explain plain, Diagonal scale, comparative scale and Vernier scale.

Dimensioning:
Explain the types of dimensioning - Explain the elements of dimensioning - Explain the methods of indicating dimensioning - Explain the arrangement of dimensioning.

Types of lines and angles:
Define points and lines - State classification of lines - State the different types of angles - Explain the method of measuring angles.

Triangles and their properties:
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 a Polygon - Name the Polygon in terms of the number of sides - State the properties of Polygon.

Unit-2: Chain Surveying

Introduction about Surveying:
Define Surveying - State the object of surveying - State technical terms - State the classification of Surveying - State the principles of Surveying - State the work of Surveyor - State the accuracy in chain Survey - State steel band

Measurement of distance by a chain and chaining:
State the methods of determining distance - State chaining and chaining a line - State unfolding the chain - Describe the reading the chain - State folding the chain - Calculate the errors in chaining.

Introduction about chain survey instruments:
State the construction and uses of the following chain survey instruments.

Ranging:
State ranging - State the necessity of ranging - State the types of ranging - Interpret the signals surveyor and the corresponding action by assistance.

Chaining on sloping ground:
Explain the methods of changing on sloping ground - State necessity of calculating horizontal distances.

Offset and Offsetting:
State the meaning of offset and offsetting - State the classification of offsets, its limits and its definition - State the methods of taking offsets for various site conditions.

Obstacles in chain surveying:
Define obstacles - State the three types of obstacles - Calculate the obstructed distance.

Introduction used for setting out right angles:
List out the instrument used for setting out right angles - State the types of cross staff and optical square - State the construction of cross staff and optical square - Explain the principles of optical square - State the uses of cross staff and optical square.

Introduction about triangulation survey:
Define the triangulation and traverse in survey - State closed and open traversed survey - State the three types of survey lines in triangulation
Explain about field work.

Calculation of area:
Calculate the areas of an irregular field - Apply geometrical formula for calculating the area - Describe the construction and use of planimeter.

Unit – 3: 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 surveyor's compass

Determining the bearing of a given triangular plot ABC and calculation of included angles:
Calculate angles from bearings - Calculate bearing from angles.

Determining the bearing of a given pentagonal plot of ABCDE and calculating included angles magnetic declination and plotting of compass survey:
Calculate the angles from bearing for a closed traverse - Calculate the bearing from angles for a closed traverse - Calculate the bearing of a pentagon - 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 its limits - State the testing the prismatic compass.

Unit – 4:Plane Table Surveying

Setting up of plane table and methods of plane tabling:
State plane tabling - Name the instruments and accessories used in plane tabling - State the construction and uses of instruments accessories of plane tabling - Explain about the setting up of plane table over a station - Explain about leveling, centering and orientation in plane tabling - Explain the methods of plane tabling

Methods of plane table survey:
Methods of plane table survey - Radiation methods of plane table survey
Intersection methods of plane table survey

Traversing method of plane table survey:
State traverse methods of plane table survey - Conduct traverse methods of plane table survey.

Locate and plot new building by two point and three point problem: Define about resection - State two and three point problem - Describe Lehman's rule - List out the errors in plane tabling - Describe the advantage and disadvantage
Prepare a road map for 1/2 km showing details on both sides:
Prepare a road map and locate the details on both sides

Inking, finishing, colouring and tracing of plane table map:
Explain about colouring of surveying symbols - Explain the importance of tracing - State the techniques/order of tracing a drawing - State the different types of reproduction of drawings.

Minor instruments used with or without plane tabling:
Explain about the construction and uses of Abney level, tangent clinometers, De Lisel's clinometers.

Unit – 5: LEVELLING&CONTOURING

Instruments Used for Levelling:
Explain the tilting level and auto level - Explain the construction a dumpy level - Explain the classification of leveling staff.

Introduction of contouring:
Define contouring - Explain the terms in contouring - Narrate the characteristics of contour

Topography and contour:
State Topography - State contour.

Tracing of grade contour:
Trace the contour gradient for alignment of roads, railways, etc -
Determine the volume of earth work and capacity of reservoir

Computation of volume:
Explain the various methods for the quantity of earth work - Compute quantity of earth work by average depth method - Compute the quantity of earth work by trapezoidal and primordial formula

Unit-6:THEODOLITE

Introduction to theodolite:
Explain the uses of the theodolite - Explain the classify of the theodolite - Explain the designate of the theodolite

Temporary adjustment of theodolite:
Set up and perform centering of the instrument - Level up the theodolite
Eliminate parallax

Measuring horizontal angle-repetition method:
Explain the repetition method - Stage advantage of repetition method
State errors which are not eliminated by repetition method.

Measuring vertical angle:
Define vertical angle - Differentiate angle of elevation and angle of depression - Explain how to measure vertical angle

Deflection angle and direct angle:
State deflection angle - Differentiate right deflection angle and left deflection angle - State the direct angle - Differentiate deflection angle and direct angle

Prolonging a line:
State the method for prolonging a line - Compare the method for prolonging a line - State most suitable method for prolonging a line

Intersection of two straight lines:
Explain method one: to find intersection point of two lines – Explain method two: to find intersection point of two lines

Laying of a horizontal angle:
Explain laying of a horizontal angle by ordinary method - Explain laying of a horizontal angle by repetition method - Find equivalent lenier distance for an angular value

Traverse:
State uses of traverse surveying - State types of traverse - Differentiate open end closed traverse

Traverse checking:
Explain the checks for open traverse - Explain the checks for closed traverse

Classification of traverse:
Classify traverse based on the instrument used - Explain method of traversing - Explain how to measure traverse length in theodolite traversing - Explain how to measure traverse angle in theodolite traversing

Theodolite traversing method:
State methods of theodolite surveying - Explain loose needle method - Explain fast needle method - Compare loose needle and fast needle method

Theodolite traversing method II:
Explain include angle method - Explain direct angle method - Explain deflection angle method - Explain azimuth method

Theodolite phases:
Explain theodolite traversing phases

Closing error:
Define closing error - Find magnitude and direction of closing error

Latitudes and departures:
Determine latitude - Determine departures - Balance the traverse using transit method - Balance the traverse using Bowditch's (mathematical) method

Balancing the traverse:
Explain balancing the error - Describe various mathematical and graphical methods of balancing the traverse

Omitted measurements:
Describe omitted measurements - List out and explain the classification of omitted measurement

Trigonometric levelling (indirect leveling):
State advantage of indirect leveling - Explain various cases of trigonometric leveling - deduce the reduce level using the appropriate formula

Introduction to curves:
Explain the necessity for the provision of curves on road and railway -Explain the classification of curves - Explain the different terms used in curve

Setting of horizontal curve by linear method:
Determine the elements of curve - Determine the offset from long chord - Explain the method of setting cut curve by offset from long chord

Setting out curves by angular methods:
Determine the deflection angles of chords - Narrate the procedure of setting out of simple curve by one theodolite and tape method

Unit-7: TACHOMETRY

Methods of tachometry:
List the methods of tachometry - Explain the fixed hair method - Explain the movable hair method

Tangential method of tachometry:
Explain the tangential method of tachometry - Explain the construction of substance bar - Explain the substance method of tachometry

Triangulation:
Explain the term triangulation

Unit-8:MODERN SURVEYING INSTRUMENTS

Digital theodolite:
Explain the features of the digital theodolite - Explain the difference between theodolite and digital theodolite

Total Station:
Describe the features of the total station - Explain evolution of total station from the conventional equipment - Narrate the benefits of total station

Remote sensing:
Explain remote sensing and photogrammetry.

GPS:
Explain the features of global positioning system (GPS) - Narrate the use of GPS and method of surveying for accurate output - List the benefits of GPS

Unit-9: CADD

Introduction to cad:
Explain the term CAD - Explain the use of CAD

Draw tool bar:
Explain draw commands in CAD - Explain the method of drawing geometrical shapes in CAD

Layers:
Explain the dimensioning method in CAD - Explain the use of object snap in CAD

Modifying tool bar:
List out various modifying tools in CAD - Explain the uses of modifying tools in CAD
Printing cad drawings:
Explain the steps involved in plotting in cad

Unit-10: Building& Drainage

Building Drawing:
State the requirement of a good building drawing - State the method of drawing plan, elevation and typical section - State the scales used in building drawing - State Dimensioning and printing for building drawing.

Drainage:
State drainage and surface drainage - State four shapes of surface drainage.

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