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**Programed B.Tech Civil ii Semester**

**Subject Surveying I**

**Submitted to Engr Humaira Arshad**

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 **Q no 1 =** The following perpendicular offsets were taken at 10m intervals from a survey line to an irregular boundary line 2.82 3.37 5.82 4.26 6.59 7.90 8.52 7.42 5.43 m. Calculate the area enclosed between the survey line, irregular boundary line and first and last offset by:

##### A)Simpson'srule B) Trapezoidal Rule C) Average ordinateRule

**Sol =** A)**Simpson'srule**

Area = A = d/3 (Oo+ 4xO1 + 2xO2 + 4x O3 …+2xOn-2 + 4On-1 +On)

Area= A= 10/3((2.82 + 4x (3.37+4.26+7.90+7.42) + 2x (5.82+6.59+8.52) + 5.43))

Area = A = 454.67 sq.m

B) **Trapezoidal Rule**

Area = A = d/2 ((Oo+ 2x (O1 + O2 + O3 …+2xOn-1) +On))

 Area= A= 10/3((2.82 + 2x (3.37+4.26+7.90+7.42 + 5.82+6.59+8.52) + 5.43))

 Area = A = 321.23 sq.m

##### C) **Average ordinateRule**

Interval between offsets = d = 10 m Number of

Intervals = n = 8 Number of offsets = n + 1 = 9

Length of survey line = l = n x d = 8 x 10 = 80 m

Area = A = (Oo+ O1 + O2 +…, On) xl/ (n+1)

Area= A= (2.82 + 3.37+4.26+7.90+7.42 + 5.82+6.59+8.52 + 5.43) x 80/9

Area = A = 462.9144 sq.m

**Q no 4 =Explain the following**

 **A Objective of Hydrographic Survey**

 **B Equipment’s For Making Soundings.**

 **C Classification of leveling**

## **Ans = Objective of Hydrographic Survey Objective** of hydrographic survey

1. Measurement of tides for sea coasts i.e. construction of the sea defense work, harborsetc
2. Determination of the bed depth bysounding
* Fornavigation
* Location of rock, sand bar, buoys, navigation lightsetc.
* For location of the under water works, volume of the underwater excavationetc.
* In connection with irrigation & land drainagescheme.
1. Determination of direction of current in connectionwith
* Location of sewer outfall
* Determination of the area subjected to silt &scour
* For navigation purposes
1. Measurement of quantity of water & flow of water inconnection With water scheme, power scheme, and flood control etc.

## **Equipment’s for making sounding**

* 1. **Soundingboat**
* It should be sufficiently roomy & stable. A flat bottom boat is suitable in quiet water while round bottom boat isconvenient in roughwater.
* A power boat (steam or motor launch) is most suitablewhen wind is blowing & water converts arestrong.

## **Sounding Rods (Or Poles)**

* Sounding rod are convenient in shallow & smooth water upto

Depth of about 4 to 6m (15 to 20 feet).

* They are made of well season tough timber & are circular in cross section of 5cm diameter ( 2inch) & usually 3 to 7.5mlong ( 12 to 25ft long) , graduated in meter or feet with a metal shoe at thebottom.

Direct depth measurements are taken by lowering it vertically into the water until it hits the bottom & reading thegraduation at thesurface.

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* 1. **LeadLine**
* Lead lines are also called sounding lines are used for depth over about 6m (20ft). It consists of suitable length of stretch- resistance cord or other material to which a heavy lead weight 5 to 10 lb isattached.
* The cord is marked with feet or meter graduation & there should be checked frequently against a steel tape, fortheir accuracy.
* In use the weight is lowered into the water being careful to keep the cord vertical. The graduation at the surface isread when the weight hitsbottom

## **Soundingchain**

* For regular sounding a brass chain is most satisfactory sinceits length is practicallyconstant.
* The links are welded. The brass tags are attached at 0.2m interval but leather or cloth tags are preferred as thebrass tags can injure the hands of the lead man.
* The chain should be testedperiodically.

**C Classification of leveling**

**1. Different leveling:** It is the operation of leveling to determine the elevations of points. Some distance a part or to establish bench marks.

**2. Check leveling:** It is the operation of running levels for the purpose of checking the series of levels, which have been previously fixed. At the end of each day’s work, a line of level is run, returning to the starting point of that day with a view to check the work done on that day.

**3. Profile leveling:** It is the operation in which the object is to determine the elevation of points at known distance apart along a given line, and thus to obtain the accurate outline of the surface of the ground. It is called the longitudinal leveling or sectioning.

**4. Cross sectioning:** It is the operation of leveling to determine the surface undulation or outline of the ground transverse to the given line and on either side of it.

**5. Reciprocal leveling:** It is then method of leveling in which the difference in elevation between two points, accurately determined by two sets of observation when it is not possible to set up the level midway between the two points.

**6. Barometric leveling:** It is the method of leveling in which the altitudes of points are determined by means of a barometer, which measures atmospheric pressure.

**7. Hypsometry:** It is the method of leveling in which the heights of mountains are found by observing the temperature at which water boils.

**8. Trigonometric leveling:** It is then process of leveling in which the elevations of points are computed from the vertical, angles and horizontal distance measured in the field.

**Q no2 = todetermine the elevation of top of Church Tower, the followingobservations weremade Station A and B and top of Church Towerare in the same verticalplane. Distance between A and B = 35 m.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Inst. Station** | **Reading on BM** | **Angle of Elevation** | **Remarks** |
| A | 1.476 | 12o54’ | R.L of B.M=35.150 m |
| B | 1.363 | 9o42’ |

* + **Solution:**
	+ **Solution:**
	+ R.L of Inst. Axis at A’= 35.150 + 1.476 =36.626m
	+ R.L of Inst. Axis at B’= 35.150 + 1.362 =36.512m
	+ Difference in elevation between the arises= hd = 36.6269–36.512= 0.0114m

The correction applied is (b - hd cot α2)

**hd cot α2** = 0.114 x cot 9o42’= 0.803m

Height of top of aerial pole above inst. axis at A’ (both at same level)

**ha** = (b x tan α 1 x tan α 2 ) / ( tan α 1 – tan α 2 )

**ha** = ((b-0.803) x tan α 1 x tan α 2 ) / ( tan α 1 – tan α 2 )

**ha** =12.75 m

**R.L of Aerial pole** = 36.626+ 12. 75 = 23. 876 m

A

**Vertical Plane as the Elevated Object**

**ha** = ACtanα

**hb** = BC tan β

BC = b x sin Ѳ/ sin((pi – (Ѳ -+ø ))

AC = b x sin ø / sin((pi – (Ѳ + ø ))

**R.LofP** = R.L of Inst. Axis at A +ha

= R.L of inst. Axis at B + hb

**Q no 3** = two straights AB And AC intersect at a chain age of 4242m.The angle of intersection is 140 a is requested to set out 5 curve to connect the straights.culculate all the data necessary to set out the curve by method of offsets from the chord product .peg interval is 30m

Ans = sol

 Given data inflection angle = ?

R = 5

I = 140

Interval = 30m

Change of I.P = 4242m

Suppose Defalcation angle = 90 degree

Ist T.P = Chainge of I.P – R tan $\frac{∅}{2}$

= 4242 – 5 x Tan 90/2

T.P =4237

2nd T.P = IST T.P - $\frac{πR∅}{180}$

4229 – $\frac{π X 90}{180°}$

= 4229 m

Length Of cu rve = ist T.P -2ND T.P

4327-4229 = 8m

 Ist T.P 4237

2nd T.P = 1st T.P - $\frac{πR∅}{180}$

4237 – $\frac{π X 90}{180°}$

= 4229 m

Length of curve Ist T.P -2nd T.P

4237- 4229

= 8 m

Peg Interval = 30m

Suppose Peg interval = 2m

No of Peg = 8/2 =4m