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MATRIC NUMBER: 17/ENG03/050

COURSE: ENGINEERING SURVEYING (CVE 310)

**Question 1a**

**HOC**

Advantage

1. It is faster than R and F

Disadvantage

1. It is easier to get errors

**RISE AND FALL**

Advantage

1. It is easier to spot errors

Disadvantage

1. It is longer

**SIMPLE LEVELLING**

Advantage

1. Is easy to use
2. No adjustment for staff reading is required in, as the actual reading is seen from the eyepiece.
3. The measurement accuracy is higher.
4. Ease of use and saves time and money.

Disadvantage

1. Vertical angles cannot be measured.
2. Horizontal angle measured is not very accurate.

1b

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| B.S | I.S | F.S | H OF C | R.L | DISTANCE |
| 0.771 |  |  |  | 160 | 10 |
| 0.802 |  | 1.52 | 160.053 | 159.251 | 20 |
|  | 2.311 |  |  | 157.742 | 30 |
| 3.580 |  | 1.990 | 161.643 | 158.063 | 40 |
|  | 1.220 |  |  | 160.423 | 50 |
|  | 3.675 |  |  | 157.968 | 60 |
| 2.408 |  | 4.020 | 160.031 | 157.623 | 70 |
|  | 0.339 |  |  | 159.692 | 80 |
| 0.780 |  | 0.157 | 160.654 | 159.874 | 90 |
|  | 1.535 |  |  | 159.119 | 100 |
|  | 1.955 |  |  | 158.699 | 110 |
|  | 2.430 |  |  | 158.224 | 120 |
|  | 2.985 |  |  | 157.669 | 130 |
| 1.155 |  | 3.480 | 158.329 | 157.174 | 140 |
|  | 1.960 |  |  | 156.369 | 150 |
|  | 2.365 |  |  | 155.964 | 160 |
| 0.935 |  | 3.640 | 155.624 | 154.689 | 170 |
|  | 1.045 |  |  | 154.579 | 180 |
|  | 1.630 |  |  | 153.994 | 190 |
|  |  | 2.545 |  | 150.079 | 200 |
| $Σ$=10.431 |  | $Σ$=17.352 |  |  |  |

Check=$ΣF.S-ΣB.S$=R.L at first point-R.L at last point

 =6.921=6.921



Error in numbering caused me to use ink to correct it

QUESTION 2a

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chainage (m) | 0 | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 |
| Offset length(m) | 0 | 2.65 | 3.80 | 3.75 | 4.65 | 3.60 | 5.00 | 5.80 | 6.10 | 5.85 |

**Using Mid-ordinate rule:**

A=$Σ$hd

h1= $\frac{0+2.65}{2}$=1.325m

h2= $\frac{2.65+3.80}{2}$=3.225m

h3= $\frac{3.80+3.75}{2}$=3.775m

h4= $\frac{3.75+4.65}{2}$=4.2m

h5= $\frac{4.65+3.60}{2}$=4.125m

h6= $\frac{3.60+5.00}{2}$=4.3m

h7= $\frac{5.00+5.80}{2}$=5.4m

h8= $\frac{5.80+6.00}{2}$=5.9m

h9= $\frac{6.00+5.85}{2}$=5.925m

$$Σh=1.325+3.225+3.775+4.2+4.125+4.3+5.4+5.9+5.925$$

$Σh=$38.175m

d=30m

A=$Σhd$

= $38.175×30$

A= $1145.25m^{2}$

**Using average ordinate rule**

A=$\frac{ndΣO}{n+1}$

n=9

d=30

$$ΣO=0+2.65+3.80+3.75+4.65+3.60+5.00+5.80+6.10+5.85$$

$ΣO=$41.2m

A=$\frac{9×30×41.2}{9+1}$

A=$112.4m^{2}$

**Using trapezoidal rule**

A=$d(\frac{0\_{1}+0\_{n }}{2}+0\_{2}+0\_{3}+0\_{4}............0\_{n-1})$

$$d=30$$

A=$30(\frac{0+5.85}{2}+2.65+3.80+3.75+4.65+3.60+5.00+5.80+6.10)$

A=$30(38.275)$

A=$1148.25m^{2}$

**Using Simpson's rule**

$$A=\frac{d }{3 }\left[\left(0\_{1}+0\_{n}\right)+4\left(0\_{2}+0\_{4}+.........0\_{n-1}\right)+2\left(0\_{3}+0\_{5}........0\_{n-1}\right)\right]$$

$$d=30$$

Note: Last offset was removed because number of offsets were even

$$A=\frac{30}{3 }\left[\left(0+6.10\right)+4\left(2.65+3.75+3.60+5,80\right)+2\left(3.80+4.65+5.00\right)\right]$$

$$A=962m^{2}$$

Calculating for last offset using trapezoidal rule

A=$d(\frac{0\_{1}+0\_{n }}{2}+0\_{2}+0\_{3}+0\_{4}............0\_{n-1})$

$$A=30\left[\frac{6.40+5.85}{2}\right]$$

$$A=183.75m^{2}$$

Therefore $ΣA=962+183.75 A=1145.75m^{2}$

2b

**CHARACTERISTICS OF CONTOUR**

1. Contours of different elevations cannot cross each other. If contour lines cross each other, it shows existence of overhanging cliffs or a cave.
2. Contour lines with U-shape with convexity towards lower ground indicate ridge. Contour lines with V-shaped with convexity towards higher ground indicate valley.



1. Irregular contours indicate uneven surface, approximately concentric closed contours with decreasing values towards centre indicate a pond.



1. Contour lines generally do not meet or intersect each other. If contour lines are meeting in some portion, it shows existence of a vertical cliff.



1. Approximately concentric closed contours with increasing values towards centre indicate hills.

