

Buge Peter Kirah.

17/ENG03/013.

CIVIL ENGINEERING.

CVE 310

Survey II.

Question No 1.

RISE AND FALL METHOD.

The rise and fall method consists of determining the difference of elevation between consecutive points by pairing comparing each point after the first that immediately preceding it.

Advantages.

- => There is a complete check for all readings in the rise and fall method.
- => This method is preferable for checking levelling where number of change points are more.

Drawbacks / Set backs.

- => This method is complicated and is not easy to carry out during work.
- => Reduction of levels here, takes a whole lot more time.

HEIGHT OF CALIMATION METHOD.

This consists of finding the elevation of the height of calibration for every set up of the instrument and then obtaining the reduced level of point with reference to the negative height of calibration.

Advantages.

- => This method is simple and easy.
- => Reduction of levels is easily carried out.

Draw backs.

- ⇒ This method is not applicable when the number of change points are more.
- ⇒ There is no check for intermediate sight readings.

b)	0.711 BS	1.535 IS
	1.52. FS	1.955 IS
CP	0.802 BS	2.430 IS
	2.311 IS	2.935 IS
	1.990 FS	3.480 FS.
CP	3.580 BS	CP 7.755 BS
	1.220 IS	1.960 IS
	3.675 IS	2.365 IS
	4.020 FS	3.640 FS.
CP	2.408 BS	CP 0.935 BS
	0.339. IS	1.045 IS
	0.157. FS	1.630 IS
CP	0.780 BS	2.575. FS.

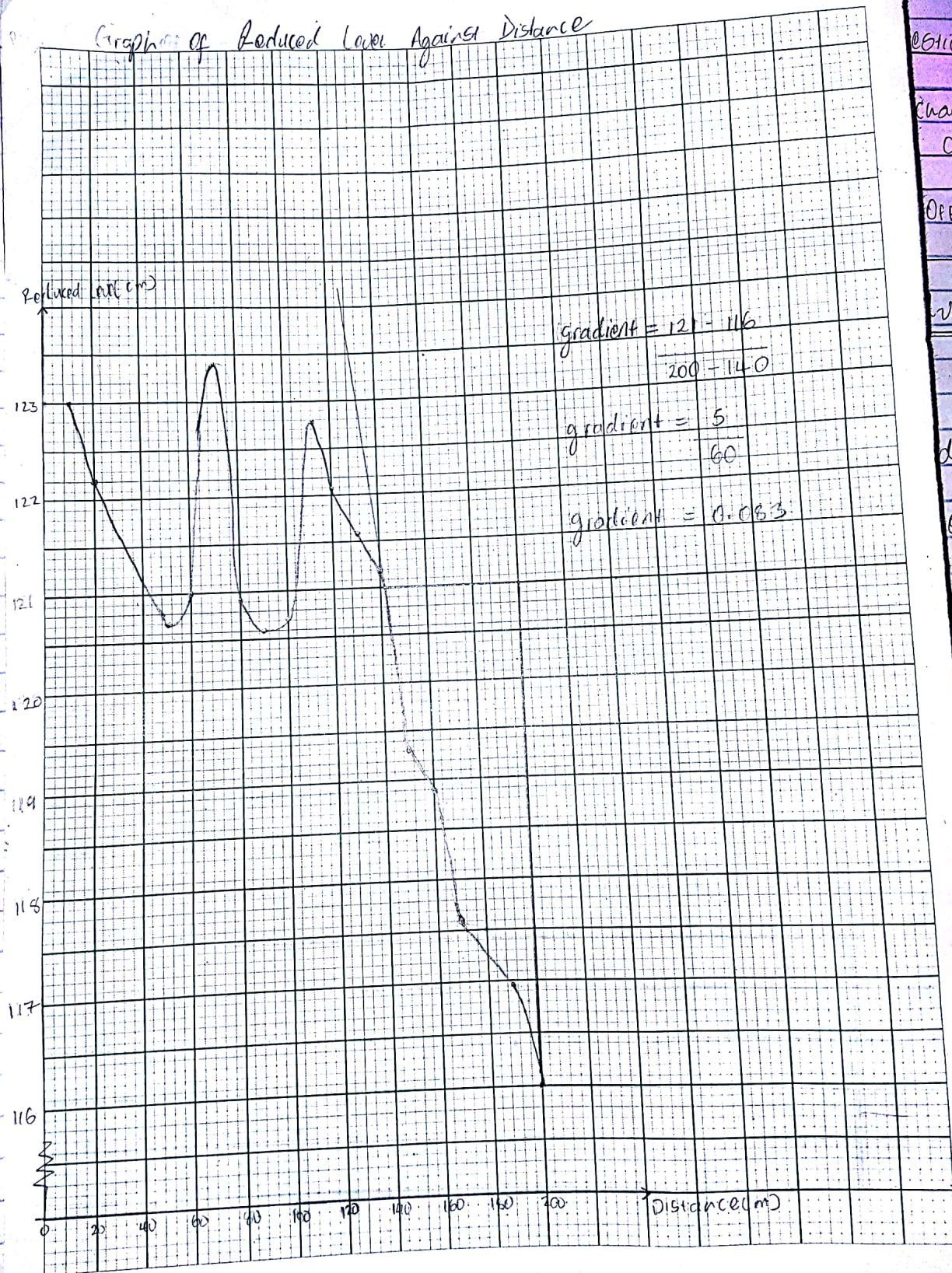
BS	IS	FS	HOC	RL	DISTANCE	REMARK.
0.771			123.771	123.00	10	OBM
0.802		1.52	123.055	122.251	20	
	2.311			120.742	30	
3.580		1.990	124.643	121.063	40	CP
	1.220			123.723	50	
	3.675			120.768	60	
2.408		4.020	123.031	120.623	70	CP
	0.339.			120.692	80	
0.780		0.157	123.554	122.871	90	
	1.535			122.889	100	
	1.795			121.654	110	
	2.430			120.324	120	
	2.985.			120.669	130	
1.155.		3.480	121.329	120.174.	140	CP
	1.960			119.364	150	
	2.365.			118.764	160	
0.935.		3.640	116.079	117.689.	170	CP.
	1.045			117.579	180	
	1.630			116.994	190	
		2.545.		116.079	200.	
	$\Sigma = 10.431.$		$\Sigma = 17.352$			

$$\begin{aligned} \text{Check} &= \text{Sum of B.S} - \text{Sum of F.S} - \text{Last RL} - \text{First RL} \\ &= 10.431 - 17.352 = 116.079 - 123.00 \\ &\Rightarrow -6.9 = -6.9. \end{aligned}$$

$$\text{Reduced level} = 110 + 0.13.$$

$$= \underline{123.}$$

Graph of Reduced Level Against Distance



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Question no 2.

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

Average Ordinate Rule.

$$A = \frac{nd \Sigma O}{n+1}$$

$$d = 30 \quad n = 9$$

$$\Sigma O = 0 + 2.65 + 3.80 + 3.75 + 4.65 + 3.60 + 5.00 + 5.80 + 6.10 + 5.85$$

$$\Sigma O = 41.15$$

$$A = \frac{9 \times 30 \times 41.15}{9+1}$$

$$A = \frac{11110.5}{10}$$

$$= 1111.05 \text{ m}^3 \quad \text{or} \quad 0.111105 \text{ hectares}$$

Mid-Ordinate Rule.

$$A = d \Sigma h$$

$$h_1 = \frac{0 + 2.65}{2} = 1.325 \text{ m}$$

$$h_2 = \frac{2.65 + 3.80}{2} = 3.225 \text{ m}$$

$$h_3 = \frac{3.80 + 3.75}{2} = 3.775 \text{ m}$$

$$h_4 = \frac{3.75 + 4.65}{2} = 4.2 \text{ m}$$

$$h_5 = \frac{4.65 + 8.60}{2} = 4.125 \text{ m.}$$

$$h_6 = \frac{8.60 + 5.00}{2} = 4.3 \text{ m}$$

$$h_7 = \frac{5.00 + 5.10}{2} = 5.4 \text{ m}$$

$$h_8 = \frac{5.10 + 6.10}{2} = 5.75 \text{ m.}$$

$$h_9 = \frac{6.10 + 5.80}{2} = 5.95 \text{ m.}$$

$$d = 30$$

$$\Sigma h = 1.825 + 3.225 + 3.775 + 4.2 + 4.125 + 4.3$$
$$+ 5.4 + 5.75 + 5.95$$

$$\Sigma h = 38.275 \text{ m.}$$

$$A = 30 \times 38.275$$

$$= 1148.25 \text{ m}^2$$

$$= 0.114825 \text{ hectares.}$$

TRAPEZOIDAL RULE.

$$A = d \left[\frac{O_1 + O_n}{2} + O_2 + O_3 + O_4 + \dots + O_{n-2} \right]$$

$$d = 30.$$

$$A = 30 \left[\frac{0 + 5.80}{2} + 2.65 + 8.10 + 8.75 + 4.65 + 3.60 + 5.0 + 5.80 \right]$$
$$+ 6.10$$

$$A = 30 (2.925 + 35.35)$$

$$= 30 \times 38.275$$

$$= 1148.25 \text{ m}^2 \triangleq 0.114825 \text{ hectares.}$$

Using Trapezoidal Rule

$$30 \left[\frac{5.80 + 6.10}{2} \right]$$

$$= 30 \times 5.95 = 178.5 \text{ m}^2.$$

$$A = 959.5 + 178.5 = 1138 \text{ m}^2 \triangleq 0.1138 \text{ hectares.}$$

Characteristics of contours.

- ⇒ A series of closed contour lines on a map represents a hill if the higher values are inside.
- ⇒ A series of closed contour lines on a map represents a depression, if the higher values are outside.
- ⇒ Contour lines cross a ridge or valley at right angle. If the higher values are inside the bend or loop it represents a ridge and if the higher values are outside the bend it represents a valley.
- ⇒ Contour lines cannot end anywhere but close on themselves either within or outside the limits of the map.
- ⇒ Contour lines cannot merge or cross one another on a line except in the case of an overhanging cliff.

