**SIMON BOLIYEH DION**

**CIVIL ENGINEERING**

**17/ENG03/051**

**CVE 310: ENGINEERING SURVEY II**

**QUESTION ONE**

1. The methods of levelling are:

* Height of Collimation system
* Rise and Fall system

**HEIGHT OF COLLIMATION SYSTEM**

|  |  |
| --- | --- |
| ADVANTAGES | DRAWBACKS |
| * This method is rapid. | * There is no check on the reduced level of the intermediate sight. |
| * This method involves fewer calculations. | * Errors in the intermediate reduced levels cannot be detected. |
| * This method is suitable for levelling where there are a number of intermediate sights (longitudinal levelling). | * This system is not suitable for levelling where there are no intermediate sights (fly levelling). |
| * Reduction of levels is easy. | * There are only two checks on the accuracy of RL calculation. |

**RISE AND FALL SYSTEM**

|  |  |
| --- | --- |
| ADVANTAGES | DRAWBACKS |
| * There are checks on the reduced level of the intermediate sight. | * This method is slow. |
| * The errors in the intermediate reduced levels can be detected. | * This method involves a lot of calculations. |
| * This system is suitable for levelling where there are intermediate sights (fly levelling) | * This method is not suitable for levelling where there are a number of intermediate sights (longitudinal levelling) |
| * There are three checks on the accuracy of RL calculation. | * Reduction of levels is harder. |

1b.) R.L = 110 + Matriculation number; 110 + 51 = 161

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| B.S | I.S | F.S | H OF C | R.L | DISTANCE |
| 0.771 |  |  | 161.771 | 161 | 10 |
| 0.802 |  | 1.52 | 161.053 | 160.257 | 20 |
|  | 2.311 |  |  | 158.742 | 30 |
| 3.580 |  | 1.990 | 162.643 | 159.063 | 40 |
|  | 1.220 |  |  | 161.423 | 50 |
|  | 3.675 |  |  | 158.968 | 60 |
| 2.408 |  | 4.020 | 161.031 | 158.623 | 70 |
|  | 0.339 |  |  | 160.692 | 80 |
| 0.780 |  | 0.157 | 161.654 | 160.874 | 90 |
|  | 1.535 |  |  | 160.119 | 100 |
|  | 1.955 |  |  | 159.699 | 110 |
|  | 2.430 |  |  | 159.224 | 120 |
|  | 2.985 |  |  | 158.669 | 130 |
| 1.155 |  | 3.480 | 159.329 | 158.174 | 140 |
|  | 1.960 |  |  | 157.369 | 150 |
|  | 2.365 |  |  | 156.964 | 160 |
| 0.935 |  | 3.640 | 156.624 | 155.689 | 170 |
|  | 1.045 |  |  | 155.579 | 180 |
|  | 1.630 |  |  | 154.994 | 190 |
|  |  | 2.545 |  | 154.079 | 200 |
| =10.431 |  | =17.352 |  |  |  |

Check==R.L at first point-R.L at last point

=6.921=6.921

HC= RL + BS

HC(1) = 161+0.771=161.771

RL = HC-FS

RL(1)=161.771-1.52=160.251

HC(2)= 160.251+ 0.802=161.053

RL(2)= 161.053 – 2.311 =158.742

RL(3)=161.053-1.990=159.063

HC(3)=159.063+3.580=161.643

RL(4)=162.643-1.220=161.423

RL(5)=162.643-3.675=158.968

RL(6)=162.643-4.020=158.623

HC(4)=158.623+2.408=159.031

RL(7)= 156.031-0.339=160.692

RL(8)= 161.031-0.157=160.874

HC(5)=161.654+0.780=161.654

RL(9)= 161.654-1.535=160.119

RL(10)= 161.654-1.955=159.699

RL(11)= 161.654-2.430=159.224

RL(12)= 161.654-2.985=158.669

RL(13)= 161.654-3.480=158.174

HC(6)=159.329+1.155=159.329

RL(14)= 159.329-1.960=157.369

RL(15)= 159.329-2.365=156.964

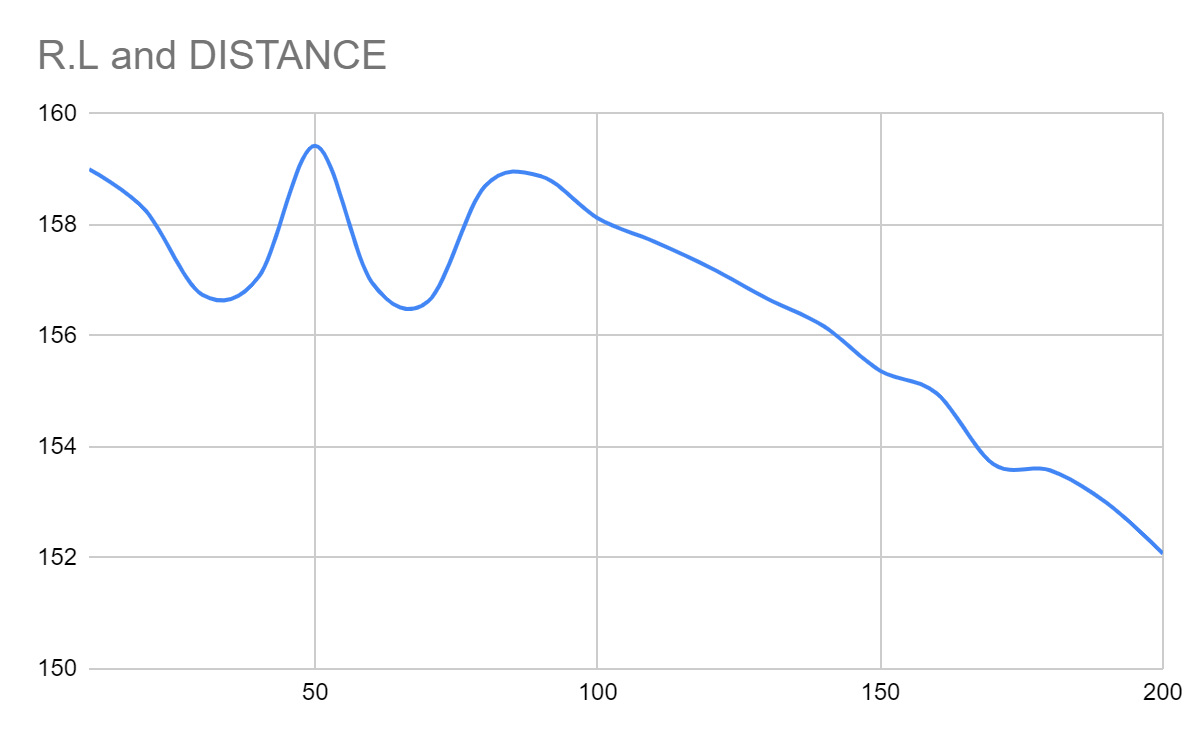
RL(16)= 159.329-3.640=155.689

HC(7)=155.689+0.935=155.624

RL(17)= 156.624-1.045=155.579

RL(17)= 156.624-1.630=154.994

RL(17)= 156.624-2.545=154.079



**QUESTION TWO**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |

1. **Using Mid-ordinate rule:**

A=hd

h1= =1.325m

h2= =3.225m

h3= =3.775m

h4= =4.2m

h5= =4.125m

h6= =4.3m

h7= =5.4m

h8= =5.9m

h9= =5.925m

38.175m

d=30m

A=

=

A=

1. **Using average ordinate rule:**

A=

n=9

d=30

41.2m

A=

A=

1. **Using trapezoidal rule:**

A=

A=

A=

A=

1. **Using Simpson's rule:**

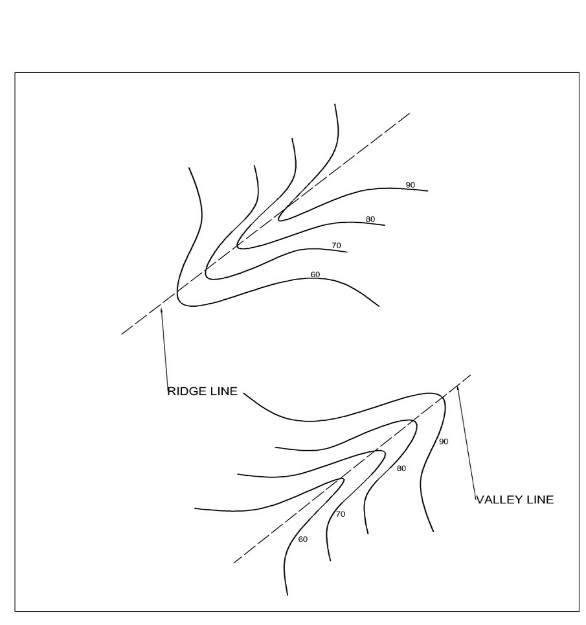
Note: Last offset was removed because number of offsets were even

Calculating for last offset using trapezoidal rule

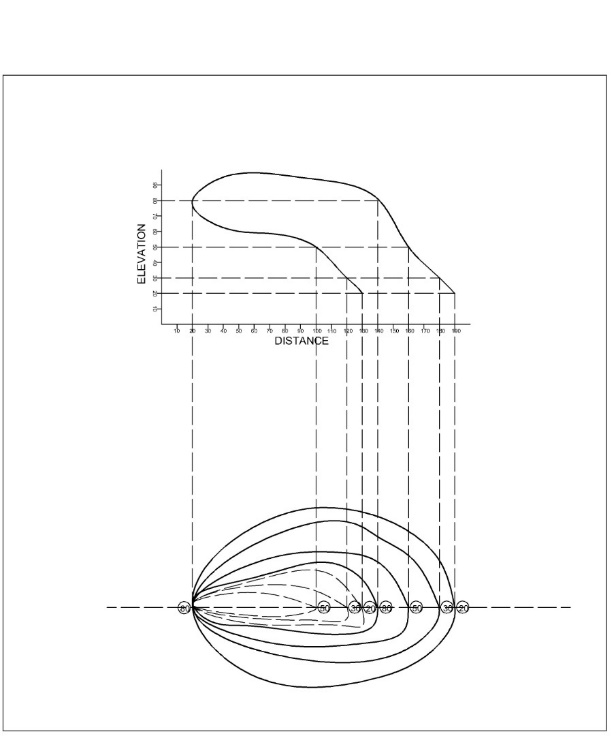
A=

Therefore

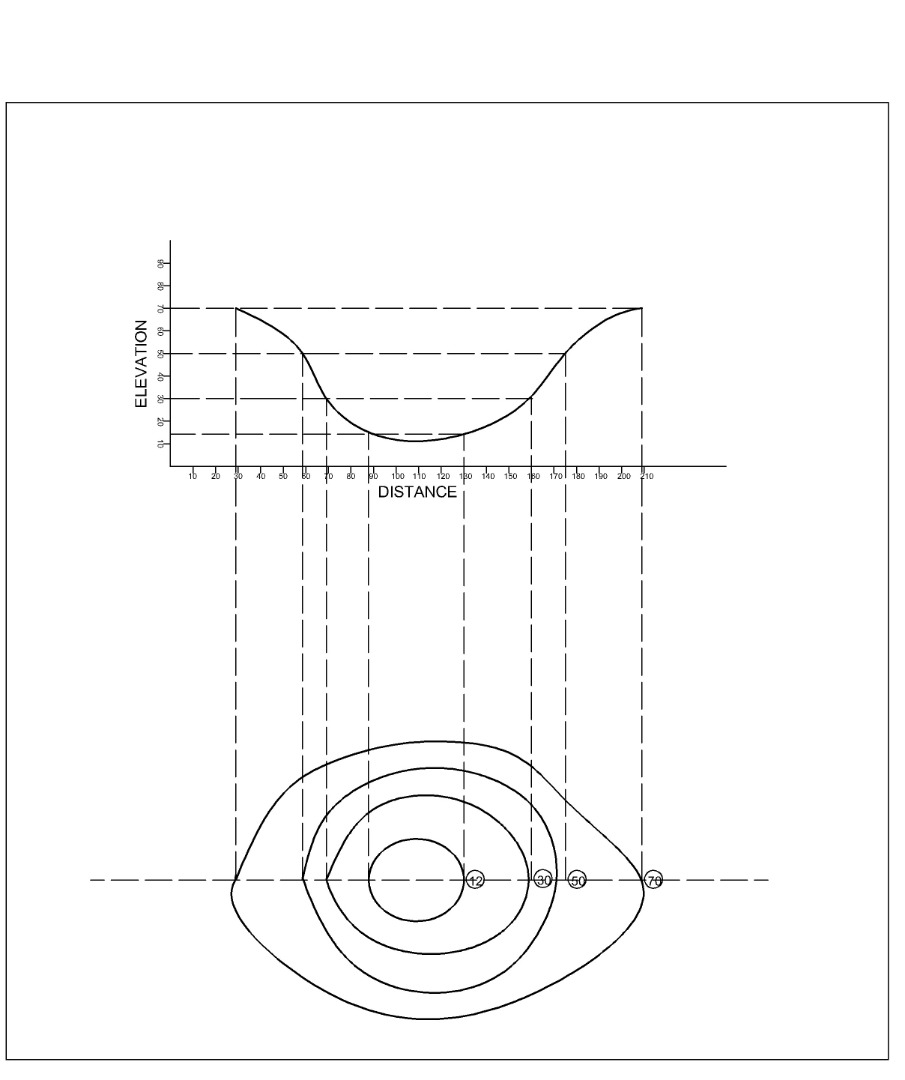
1. **CHARACTERISTICS OF CONTOURS**
2. Contour lines cross a watershed or ridge line at right angles. They form curves of U-shape round it with the concave side of the curve towards the higher ground.



1. Contour lines with V-shaped with convexity towards higher ground at right angles indicate valley.
2. Contour lines meeting at a point indicate a vertical cliff.



1. A series of closed contour lines on the map indicates a depression if the higher values are outside.



1. A series of closed contour lines on the map represents a hill, if the values are inside.

