**NAME : ZIBIRI MIRACLE**

**MATRIC NUMBER : 17/ENG03/059**

**ASSIGNMENT TITLE : 1. Levelling, 2. Areas & volume, 3. Contours**

**COURSE TITLE : Engineering Surveying II**

**COURSE CODE : CVE 310**

**1a) Methods of levelling**

**Height of collimation system**

**Advantages**

* It is rapid as it involves few Calculation
* There are two checks on the accuracy of RL calculation
* This system is suitable for longitudinal leveling where number of intermediate sights
* Visualization is not necessary regarding the nature of the ground

**Disadvantages**

* There is no check on the RL of the intermediate sight
* Errors in the intermediate RLs cannot be detected.

**Rise and fall system**

**Advantages**

* There is a check on the RL of the intermediate points
* Errors in the intermediate RLs can be detected as all the points are correlated
* There are three checks on the accuracy of RL calculation
* This system is suitable where there are no intermediate sights

**Disadvantages**

* It is laborious involving several calculations.
* Visualization is necessary regarding the nature of the ground

1B.) C = RL + B.S

RL = C F.S (I.S)

RL = 110 + matric No. (59)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| B.S | I.S | F.S | H OF C | R.L | DISTANCE |
| 0.771 |  |  |  | 169 | 10 |
| 0.802 |  | 1.52 | 168.993 | 168.191 | 20 |
|  | 2.311 |  |  | 166.682 | 30 |
| 3.580 |  | 1.990 | 170.583 | 167.003 | 40 |
|  | 1.220 |  |  | 169.363 | 50 |
|  | 3.675 |  |  | 166.908 | 60 |
| 2.408 |  | 4.020 | 168.971 | 166.563 | 70 |
|  | 0.339 |  |  | 168.632 | 80 |
| 0.780 |  | 0.157 | 169.594 | 168.814 | 90 |
|  | 1.535 |  |  | 168.059 | 100 |
|  | 1.955 |  |  | 167.639 | 110 |
|  | 2.430 |  |  | 167.164 | 120 |
|  | 2.985 |  |  | 166.609 | 130 |
| 1.155 |  | 3.480 | 167.269 | 166.114 | 140 |
|  | 1.960 |  |  | 165.309 | 150 |
|  | 2.365 |  |  | 164.904 | 160 |
| 0.935 |  | 3.640 | 164.564 | 163.629 | 170 |
|  | 1.045 |  |  | 163.519 | 180 |
|  | 1.630 |  |  | 162.934 | 190 |
|  |  | 2.545 |  | 162.019 | 200 |
| =10.431 |  | =17.352 |  |  |  |

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

= 6.921 = 6.921

Solution

= 110 + 59 = 169m

C (1) = 169 + 0.711 = 169.711

= 169.11 – 1.52 = 168.191m

C (2) = 168.191 + 0.802 = 168.993

= 168.993 – 2.311 = 166.682m

= 168.993 – 1.990 = 167.003m

C (3) = 167.003 + 3.580 = 170.583

= 170.583 – 1.220 = 169.363m

= 170.583 – 3.675 = 166.908m

= 170.583 – 4.020 = 166.563m

C (4) = 166.563 + 2.408 = 168.971m

= 168.971 – 0.339 = 168.632m

= 168.971 – 0.157 = 168.814m

C (5) = 168.814 + 0.780 = 169.594

= 169.594 – 1.535 = 168.059m

= 169.594 – 1.955 = 167.639m

= 169.594 – 2.430 = 167.164m

= 169.594 – 2.985 = 166.609m

= 169.594 – 3.480 = 166.114m

C (6) = 166.114 + 1.155 = 167.269

= 167.269 – 1.960 = 165.309m

= 167.269 – 2.365 = 164.904m

= 167.269 – 3.640 = 163.629m

C (7) = 163.629 + 0.935 = 164.564

= 164.564 – 1.045 = 163.519m

= 164.564 – 1.630 = 162.934m

= 164.564 – 2.545 = 162.019m

QUESTION 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 |

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=

Using average ordinate rule

A=

n=9

d=30

41.2m

A=

A=

Using trapezoidal rule

A=

A=

A=

A=

Using Simpson's rule

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

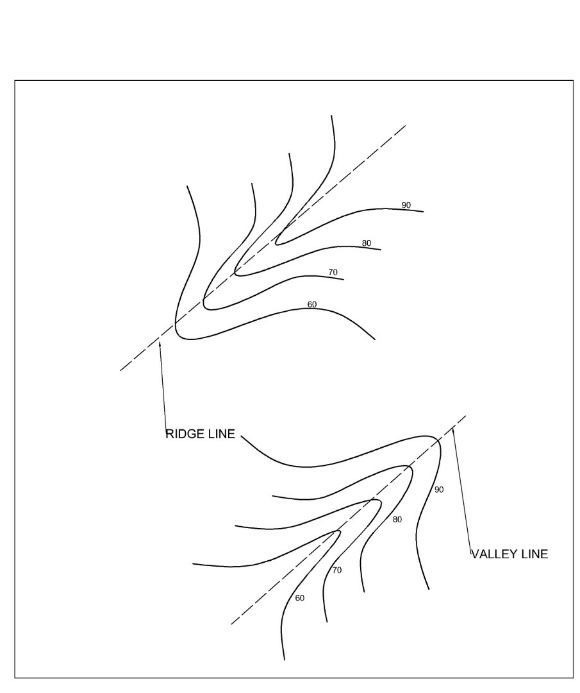
Calculating for last offset using trapezoidal rule

A=

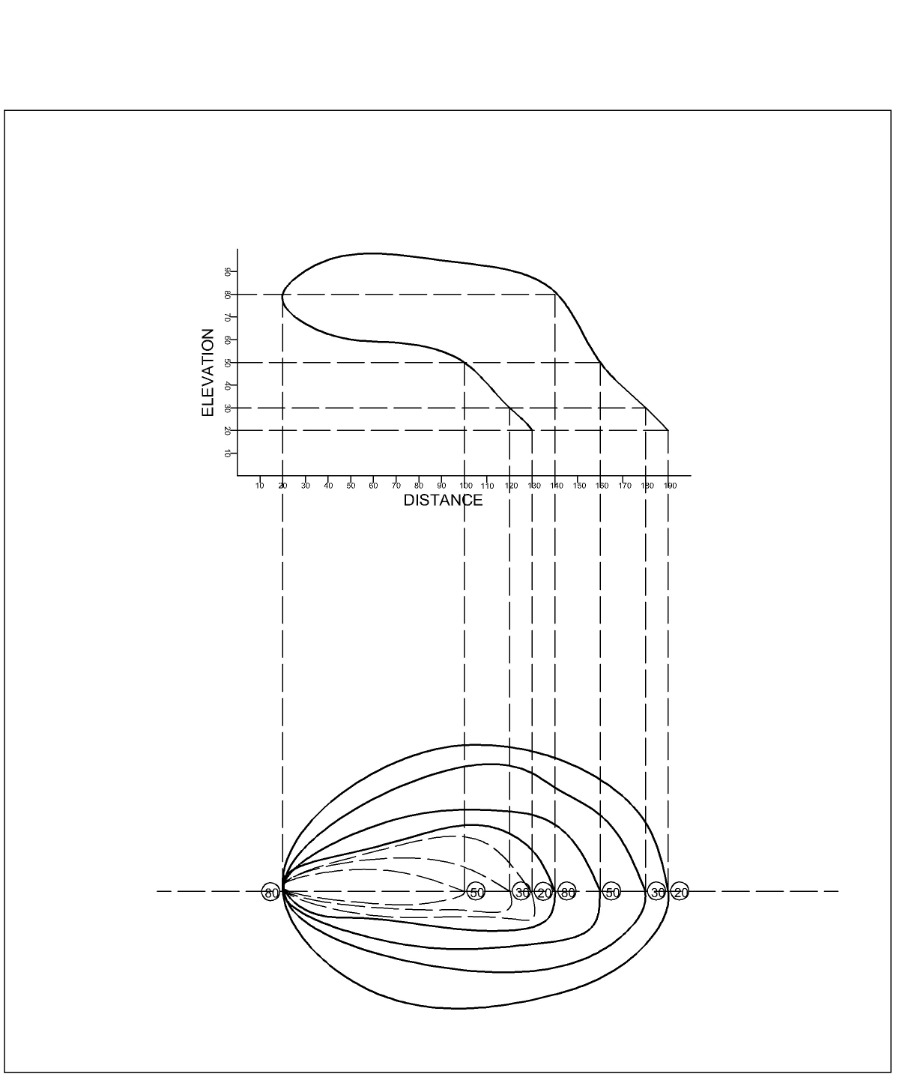
Therefore

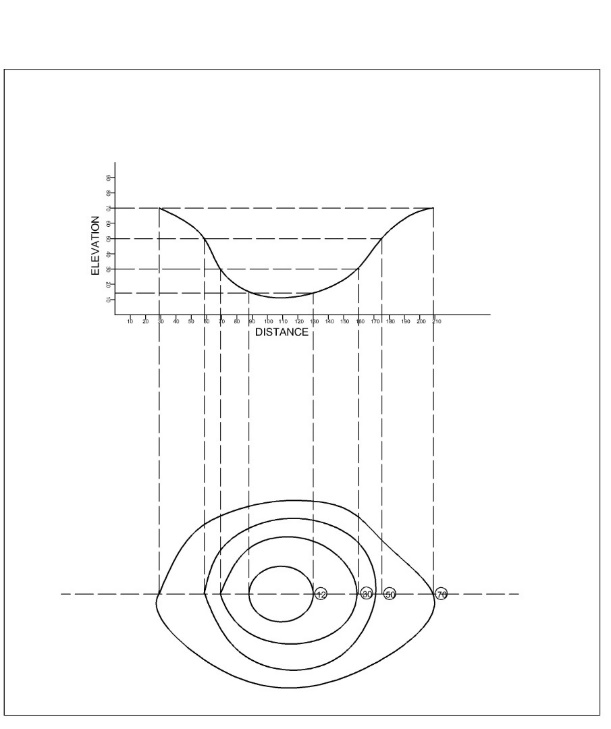
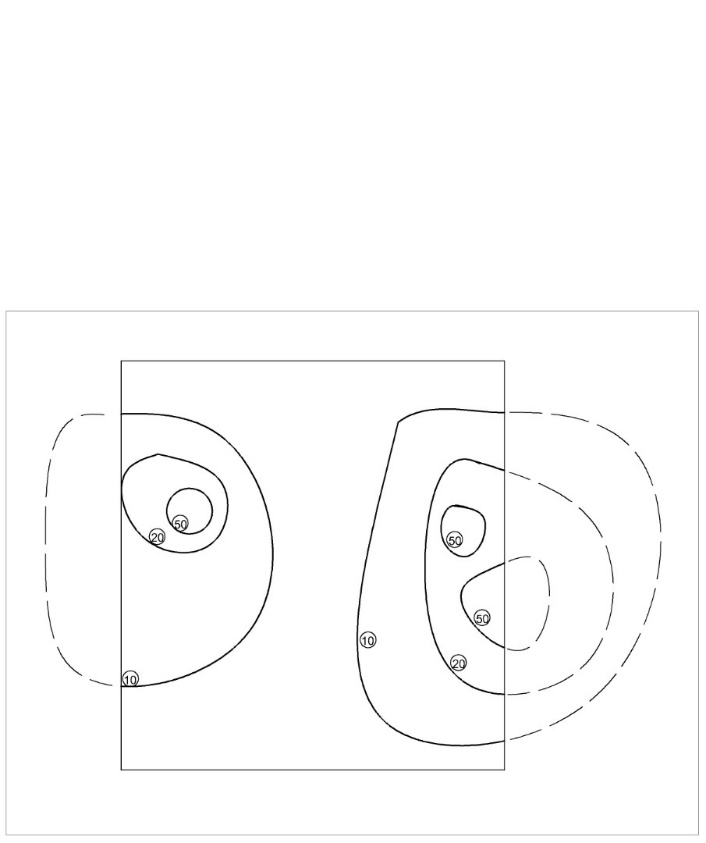
2B.)

CHARACTERISTICS OF CONTOURS

1. Contour lines crosses a ridge or valley at right angle. If the higher values are inside the bend or loop in the contour. It represents a ridge and if the higher values are outside the bend it represents the value.

1. Contour lines cannot merge or cross one another on a map except in the case of an overhanging cliff.



1. A series of closed contour on a map indicates a depression if the higher values are outside.
2. Contour line cannot end anywhere but close on themselves either within or outside the limit of the map.
3. A series of close contour lines, represent a hill if the higher valves are inside.

