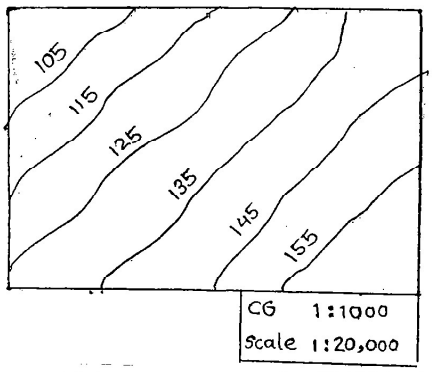
7th nov,
FRIDAY

CONTOURS

- Imaginary line passing through points of same elevation.
- It is a line in which surface of ground intercepted by level surface.

→ Contour interval

- It is the RL difference b/w two adjacent contours.
- It is a constant for the given map
- It is small for flat grounds and large for undulated grounds
- contour interval is inversely proportional to scale of map.



* Suggested contour intervals

(i)	Building sites	0.2 to 0.5
(ii)	Town planning & reservoir	0.5 to 2
(iii)	Highways & railways	2
(iv)	Location surveys	2 to 3
(v)	Geological surveys	6 to 15

→ horizontal equivalent

It is the horizontal distance b/w any two points on two consecutive contours.

$$\text{Contour gradient (CG)} = \frac{\text{Contour Interval (CI)}}{\text{Horizontal equivalent (HE)}}$$

$$HE = \frac{CI}{CG}$$

→ contour gradient

– It is a line lying on the ground surface and maintaining a constant inclination to the horizontal surface.

⇒ Radius of curvature of level

* Grade contours

Lines having equal gradient along a slope.

NOTE:

- Horizontal equivalent is variable from point to point on a contour map depending on the steepness of ground.
- HE is less for steeper grounds.

* Radius of an arc required for contour path

$$= \frac{\text{Horizontal equivalent}}{\text{Scale}}$$

For the fig given above,

$$HE = \frac{10}{\frac{1}{1000}} = 10,000$$

$$\text{Radius} = \frac{10,000}{20,000} = \underline{\underline{0.5\ m}}$$

P-70

5. $$HE = \frac{10}{\frac{1}{100}} = 1000$$

$$\text{Radius} = \frac{1000}{10,000} = \underline{\underline{0.1\ m}}$$

6. $HE = \frac{20}{0.04} = 500\ m.$

$$\text{Radius} = \frac{500}{20{,}000} = 0.025\ m$$

$$= 2.5\ cm$$

1 Acre = 4046.7 m^2 = 4840 sq.yard

→ Characteristics of Contours

(i) Two contour lines of different elevations can cross each other in case of overhanging cliff.

(ii) Two contour lines of different elevations can unite to form a line in case of vertical cliff.

(iii) Contour lines close together indicates steep slope. and they are far apart represents a gentle slope

(iv) A closed contour line with one or more higher ones inside, it represents a hill. A closed contour line with one or more lower ones inside represent a depression without an outl

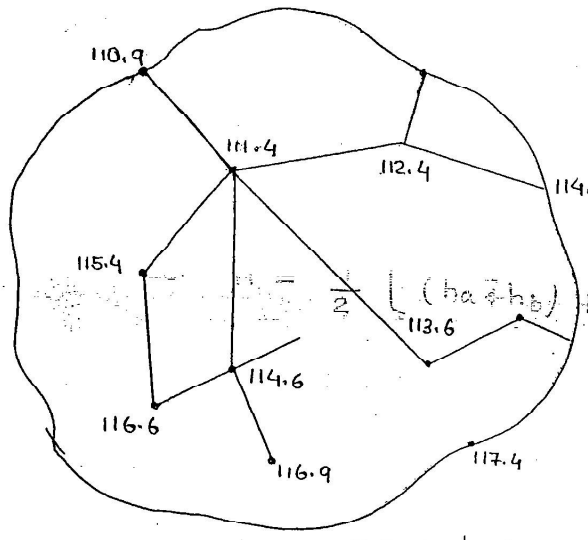
(v) Contour lines cross a ridge or line or watershed line) at right angles and form U-shape contours.

(vi) Contour lines cross a valley line at right angles and form V-shape contours.

(vii) A contour line must close upon itself though not necessarily within the limits of map

→ Methods for tracing Contours

1. Direct Method.
   a) By spot-levels
   b). By radial lines
2. Indirect Method.
   a). By squares
   b) By rectangular
   c) By grids
   d) Tacheometric methods.



Min RL = 110.6

Max RL = 117.4.

CI = 1 m.

{111, 112, 113, 114, 115, 116, 117}

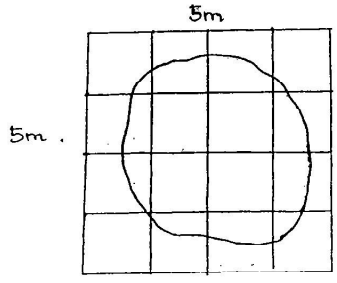
■ Spot-levels.

Q. RLs of points P & Q are 49.6 & 51.8 m repectly. Distance PQ is 20 m. Distance in m from P at which 51 m contour cuts the line PQ is ___ ?

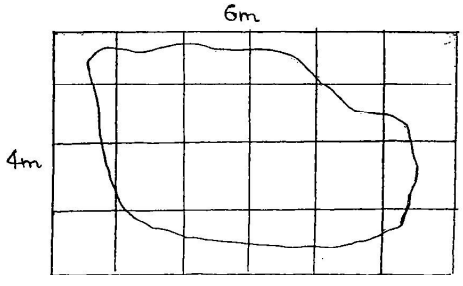
$$\text{Distance from P} = \frac{(51 - 49.6)}{(51.8 - 49.6)} \times 20 = 12.73 \text{ m}$$

- Direct method is most accurate when used for small areas where high accuracy is required.
- Indirect method is not accurate but used for large areas where less accuracy is required.
- Direct method is not suitable for hilly areas.

* By Square



* By Rectangle.



→ Uses of Contours

(i) From contour map, sections may be easily drawn in any direction

(ii) Intervisibility from two ground points plotted on the map can be ascertained.

(iii) It provides a suitable and economical site for any engg. project. A route of a given grade can be traced out on the map.

(iv) Catchment area, capacity of reservoir, quantity of earthwork can be calculated from contour map.