

# MAP

- MAPS ARE GRAPHICAL REPRESENTATION OF LAND EARTH OR A PORTION OF ANY LAND FORMS FROM THE REAL WORLD SCENERIO ( 3D VIEW) ON TO PLANE SURFACE 2 DIMENSIONAL SURFACE).
- TOPOGRAPHICAL MAPS ARE THOSE KIND OF MAPS WHICH DEPICTS THE DETAILS ( ALL NATURAL & MAN MADE FEATURES) ABOVE THE EARTH SURFACE.
- INDIAN TOPO MAPS ARE DIVIDED INTO DIFFERENT MAP SCALE ( 1:1M, 1:250K, 1:50K, 1:25K) .
- DEPENDING THE SCALE OF SURVEY, THEY FURTHER CLASSIFIED AS SMALL SCALE, MEDIUM SCALE AND LARGE SCALE MAPS.
- DEPENDING UPON THE NATURE AND REQUIREMENT OF THE MAPS THEY ARE ALSO CLASSIFIED AS RESTRICTED/ SECRET, OPEN SERIES , DEFENSE SERIES MAPS.

Maps are of different types.

Each map is unique in its design, content and construction and hence, a type by itself.

Maps are broadly classified on two bases: scale and purpose or content .

Based on the scale, there are two broad categories of maps:

i. Large Scale; and ii. Small Scale

i. Large Scale : These maps represent small area of the earth on a large size of paper/cloth/plastic sheet with greater details. Examples of some of the large scale maps are:

(i) Cadastral Maps: The term cadastral is derived from French word 'cadastre' meaning register of territorial property. The Cadastral maps are drawn to register the ownership of landed property by demarcating the boundaries of fields, buildings, etc. They are especially prepared by governments to realise land revenue and property taxes. The village maps of our country may be cited as an example of large scale maps. These maps are drawn on a very large scale, varying from 16 cm to a km to 32 cm to a km so as to fill in all possible details. The city maps may also be included in this category.

- Topographical Maps: These maps are also prepared on a fairly large scale. They are based on precise surveys conducted by the Survey of India, Dehradun. They show general surface features in detail both natural and cultural. Principal topographic features depicted on these maps are relief, drainage, swamps and lakes, forests, villages, towns, means of transport and communication like roads and railways, and canals. Indian [topo sheets](#) are generally prepared on the scale of 1:50,000.

## Map scale

Scale is the relationship between the distance on a map and the real distance on the earth's surface. It may be expressed as a representative fraction (ratio), a line scale or a statement scale. It is an important element of a map because it gives relative picture of the ground reality. As you have read earlier, maps are generally classified into large scale and small scale. However, there is no universally accepted standard for classifying maps according to scale. What one considers to be large, may appear to be small or medium for others.

## Methods of Expressing Scales

Distances on the map are smaller than the corresponding distances on actual ground. Scale is the means which enables us to reduce the whole or a part of the earth to a size which is not only convenient and handy but also logical and scientific. A general definition of scale is that it is a ratio between the distance on a map and the corresponding distance on the earth. For example if two points located 10 km apart are shown 1 cm apart on a map, then the scale of the map would be 1 cm to 10 km. It may also be converted into R.F as given below. Suppose, 1 cm = 10 KM.

$$\frac{\text{MAP DISTANCE}}{\text{GROUND DISTANCE}} = \frac{1 \text{ cm}}{10 \text{ km}}$$

$$\frac{10 \times 10,000 \text{ cm}}{100,000 \text{ cm}} = 1:1,000,000$$

(Note: 1 km has 100,000 cm.)

- The same person may consider a map to be of large scale for one purpose but of small scale for another purpose. As a result of this each specialised group of map users sets up its own standards for classification. As a matter of convention, maps having a scale 1:50,000 upto are classified as large scale maps, those falling between 1:50,000 and 1:1,000,000 as medium scale maps and those having scales above 1:1,000,000 are treated as small scale maps. The million sheets of the Survey of India and the National Atlas of India are considered to be medium scale maps.

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## Methods of Measuring Linear Distance

Linear distance on maps are of two types:

(i) Straight lines like roads, railway line, and canals;

(ii) Curved or Zigzag lines, showing streams, coastline etc.

(a) When the line is straight, the distance can be measured with the help of a divider. Open a pair of dividers and place one of its legs at one end of the straight distance and the other leg on the other end on the map. Then lift the divider and place it on the calibrated bar scale to get the distance on the ground.

(b) When the route is zigzag, place one end of a thread at the starting point and carry the thread along the line. After completing the distance stretch the thread and measure the length. It will give approximate distance. It can also be measured with the help of a plain divider, as explained earlier, but the measurement will be less accurate. It can also be done with the help of a strip of paper.

(c) Rotameter is an instrument having a route measuring wheel. Distance between two points is measured by allowing the wheel of the rotameter to move along the route.

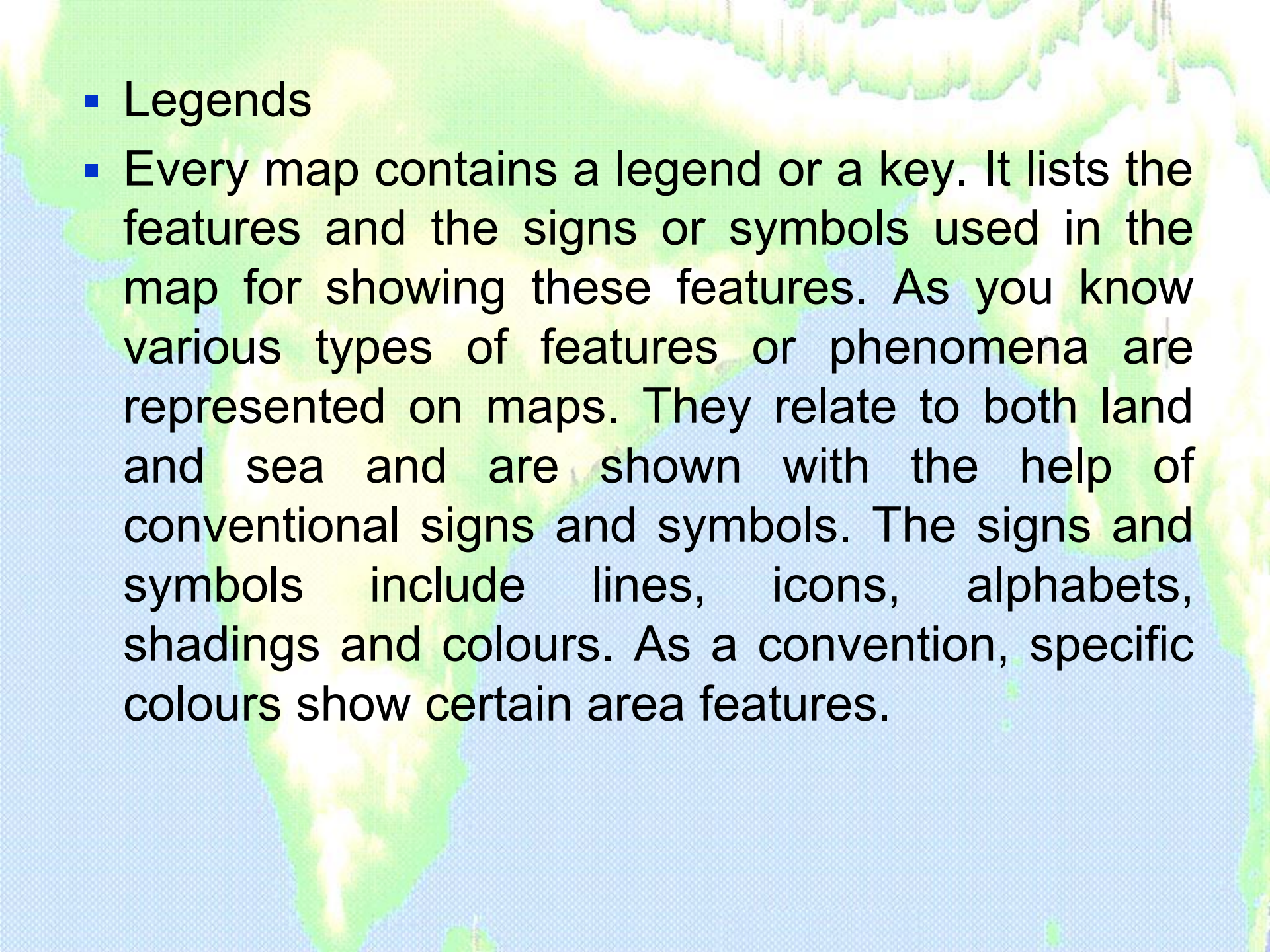
# Direction

Direction has been defined as an imaginary straight line on the map or the ground showing the angular position of various maps with respect to a common base direction. The line pointing to the north is regarded as the zero direction or base direction line.

A map must have the base directions represented on it to enable the user to locate different features with respect to each other. North, south, east and west are the four major directions.

These are also called cardinal points. In between cardinal points one may have several intermediate directions. A rough estimation of direction of the true north can be obtained by the Means of an ordinary watch. In the northern hemisphere if the watch is held in the horizontal position and turned until its hour hand points to the sun, the line that bisects the angle made by the hour hand with the line joining 12'O clock through the centre of the watch will point to the south. A similar exercise in the southern hemisphere will indicate the true north. This is also a crude method dependent upon the sun



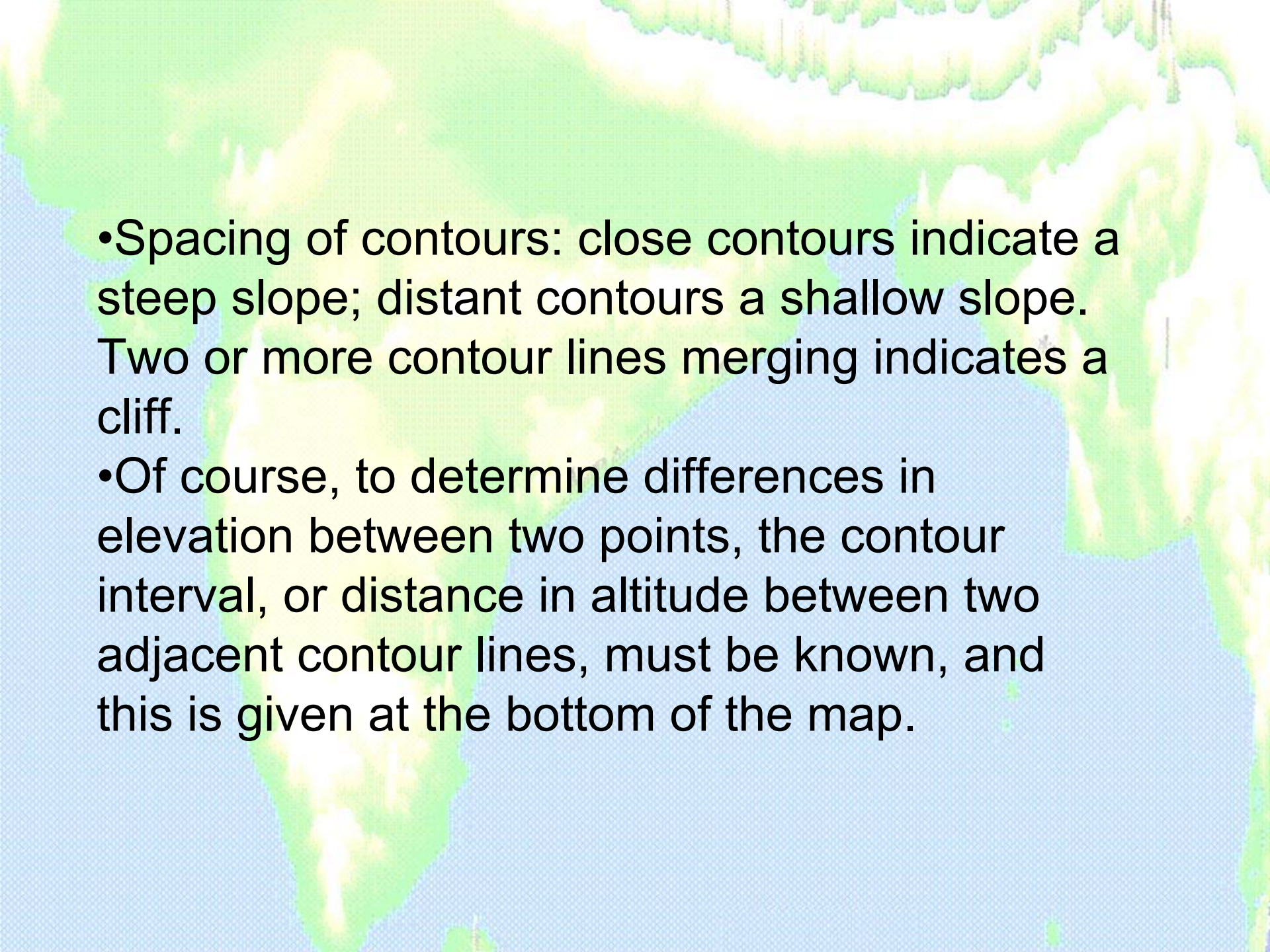
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- Legends
  - Every map contains a legend or a key. It lists the features and the signs or symbols used in the map for showing these features. As you know various types of features or phenomena are represented on maps. They relate to both land and sea and are shown with the help of conventional signs and symbols. The signs and symbols include lines, icons, alphabets, shadings and colours. As a convention, specific colours show certain area features.

## CONTOURS

- A contour is a line on a map joining two points of equal height, and is the standard method of showing relief on a topographical map. Contours are shown at regular vertical intervals. On a 1:50,000 map the interval is 10 m.

## INTERPRETATION OF CONTOURS

- The shape of the contours indicates the shape of the ground. When contours are further apart, the slope is gentle and when contours are close together the greater the drop. When contours are equal distance apart the slope is uniform:
  - a.Contours are continuous. No matter how far they travel, they always return to where they started. Except for a cliff.
  - b.When spacing of contours down a slope gets close together at the bottom, the slope is convex.
  - c. When spacing is further apart, the slope is concave.

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- A topographic map with contour lines. The map shows a landmass with various elevations. The background is a light blue color, and the landmass is shaded in light green and yellow. Contour lines are drawn across the landmass, representing different elevations. The lines are more closely spaced in some areas, indicating a steeper slope, and more widely spaced in other areas, indicating a shallower slope. Two or more contour lines are shown merging in one area, indicating a cliff.
- Spacing of contours: close contours indicate a steep slope; distant contours a shallow slope. Two or more contour lines merging indicates a cliff.
  - Of course, to determine differences in elevation between two points, the contour interval, or distance in altitude between two adjacent contour lines, must be known, and this is given at the bottom of the map.

## INTERPRETATION OF TOPO MAPS AND SURVEY MAPS

IT involves ability to follow the symbols portrayed in the map.

- Understand the information given in pictorial and written form
- Visualize the topography of the original area by interpreting the contour
- Spot heights skillfully
- Map reading is a practical skill.
- Can be developed only by reading topo map very minutely and mentally analyzing the details with the help of conventional signs & symbols given in their conventional colours'
- As the conventional symbols cannot cover all the graphical details, each topographical map sheet provides the necessary information in the margin for the users.

1. Identification of topographical maps

2. Reading the Grid reference

3. Scale (R.F.)

4. Representation of Relief by contours

5. Directions

6. Measuring distances and calculating distances

7. Drainage

8. Man-made and natural features

9. Means of transport in relation to relief

10. Land use and irrigation

11. Settlements

12. Inferring occupations

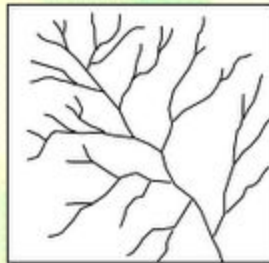
13. Importance of colours and tints in topographical survey sheets

14. Legend

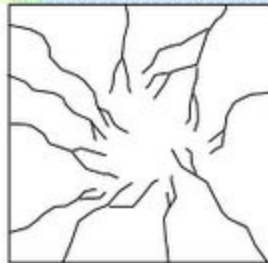
15. Glossary of conventional signs and symbols used in survey maps

## THE DRAINAGE

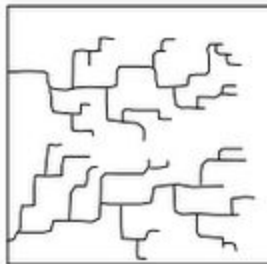
- The term drainage basin describes an area drained collectively by the network of a river along with its tributaries and sub-tributaries of various dimensions.
- An area drained by a single river is called its Catchment Area.
- A drainage system as seen in the topographical sheets usually develops a pattern which is related to the general structure of its basin.



Dendritic Drainage



Radial Drainage



Rectangular Drainage

## SIGNIFICANCE OF COLOURS IN TOPOSHEETS

On toposheets colours are used to show certain features. Each colour used on a map has significance.

1. **BLACK** – All names, river banks, broken ground, dry streams, surveyed trees, heights and their numbering, railway lines, telephone and telegraph lines, lines of latitude and longitude.
2. **BLUE** – Water features or water bodies that contain water.
3. **GREEN** – All wooded and forested areas, orchards, scattered trees and scrubs.

Note:- Prominent surveyed trees are shown in black. Surveyed trees have numbers on their trunks. They serve as landmarks and are not allowed to be cut.

4. **YELLOW** – All cultivated areas are shown with a yellow wash.
5. **WHITE PATCHES** – Uncultivable land
6. **BROWN** – Contour lines, their numbering, form lines, and sand features such as sand hills and dunes.

- 7. RED – Grid lines (eastings and northings) and their numbering, roads, cart tracks, settlements, huts and buildings.
- SETTLEMENTS
- 1. On a topo map, all settlements are shown by symbols in RED colour.
- 2. The size of the symbol and size and style of letters used give an idea of the size of the settlement.
- 3. In the case of large cities, major roads are marked and named.
- 4. Deserted village cities, temporarily occupied huts are also shown.
- 5. Places of worship, forts, water towers, burial grounds, police stations, post office, dak bungalow, circuit houses, etc. are indicated by suitable symbols.
- NOTE – Site is the land on which the settlement (village or town) is built.
- Dense settlements : Fertile plains and wide river valleys.
- · Sparse Settlements : forests, deserts, mountain slopes, plateaus and hill tops with poor vegetation·
- Absence of Settlements: Swamps, marsh land, sandy deserts, thick impenetrable forests, flood-prone areas, steep mountain slopes.