e-text

Paper-CC9 (*Unit-II*)

Cartographic Techniques

Profiles

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Profiles

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The positions of the elevation and gradient displayed in a contour-oriented map can be clearly articulated with the help of Profiles. It provides an important help in understanding and describing and relief features or landforms.

Difference between a Profile and a Section

Often the terms 'Profiles' and 'section' are used in the same sense, but there are some basic differences. The literal meaning of section is the naked surface produced by cutting. In contrast, the outline developed on the surface generated by the cut or section is called a Profile. In other words, if a landform is cut to the bottom in the vertical direction with the help of a line, the new surface that will be seen will be called a section and this surface will have an upper edge that reveals the surface is profile. Thus with the help of the section, the geological structure of the rocks below the surface is displayed, while the surface represents the elevation and slope conditions on the surface through the guide. The soil profile is an exception to this.

Method of Construction of a Profile

There are two methods to draw the Profiles of a part of the contour map.

i. In the first method, using a straight-edged paper strip or graph paper, a Profile is made on a different sheet of paper from given contour map;

ii. The second method is used to create a column on the map itself.

First method of profile construction:

- *Suppose A and B are any two points on a contour-oriented map with a circumference between them (See Fig.1.A).*
- *Match the points A and B with a straight line and place a straight-edge paper strip or graph paper with the AB line.*
- *Now carefully mark the positions of all those points, including the points A and B where the contour lines between the points A and B touch the strip, with the pencil on the paper strip.*
- *Write the height of the respective contour line on each sign (Figure 1.B).*
- *Draw a straight line AB 'equal to AB on any other paper and carefully move the points marked in the strip on this line and raise the height equal to the height written on each point according to a given vertical scale.*
- *Draw the smooth curve joining the vertices of these perpendicular lines. This curve will reveal the Profile between the points A and B on the map (Figure 1.C).*

Merit of this method

Since the length of the base line of a column is always equal to the length of the section line, So this method is particularly useful in the case where section line is not horizontal. For example, the CD section line drawn on the contour map displayed in the Figure no. 3 is not horizontal, so the right-hand side of the diagram is drawn using the same CD section line in the same method.

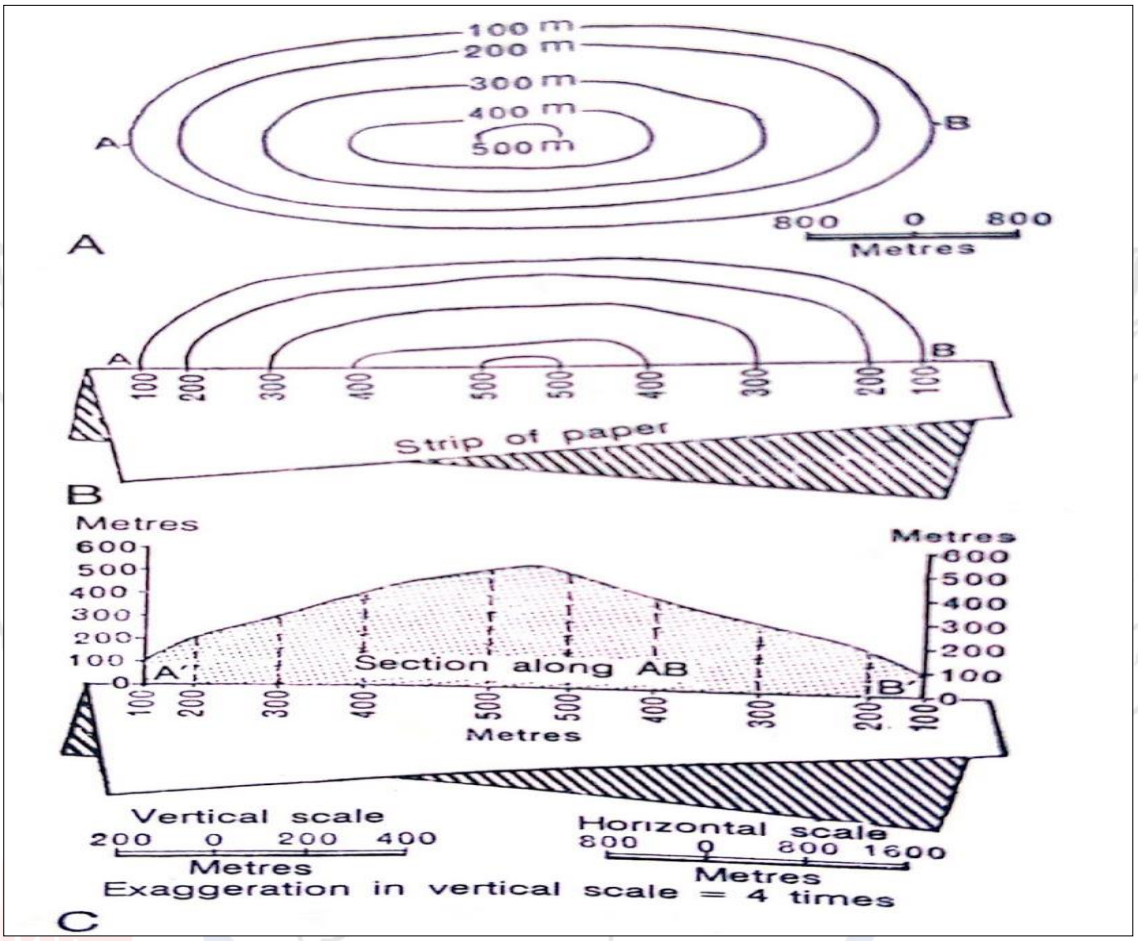

Figure no.1

Second method *- This method is used to create a column on the contour line. Suppose a contour is to be drawn between any two points A and B located on the contour line.*

First you have to draw a simple line joining the points A and B that crosses the contour lines between these points at C, D, E, F G and H points.

From the points A and B, draw the AX and BY lines of the same length respectively on the underside of the map.

Combine the X and Y lines. The XY straight line will be the base line of the column and this line will reveal the sea level.

Now assuming the values of X and Y to be zero, put the height signs on the XA and YB perpendicular lines according to a scale. The difference of the values of these signs should be equal to the value of the contour line interval.

Draw lines parallel to XY from each sign. These parallel lines will reveal different elevations above sea level.

Now as per see in the below diagram draw perpendicular from A, C,D,E,F,G,H and B points as AA ', CC', DD ', EE', FF ', GG', HH 'and' BB '.

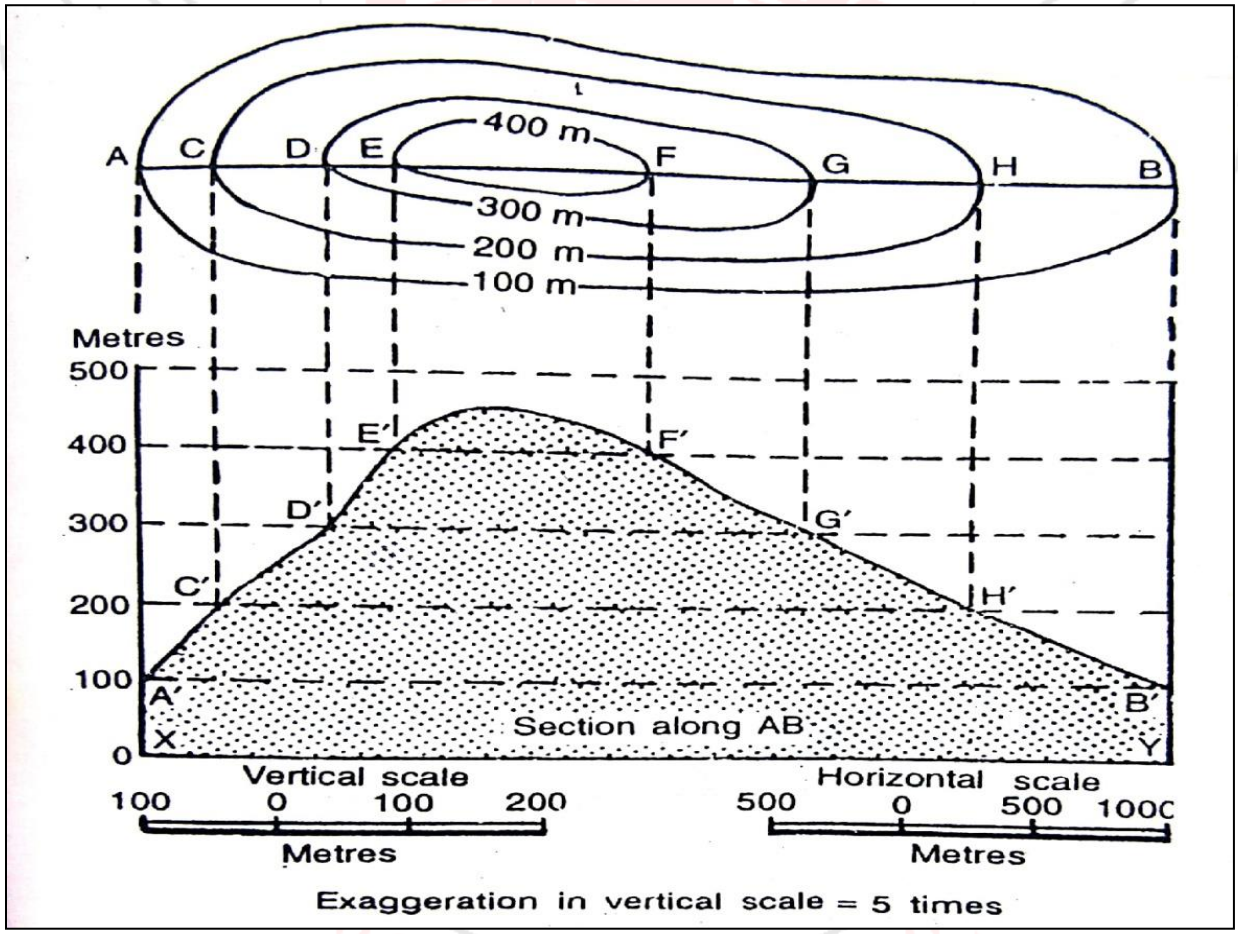

Figure no.2

Horizontal and vertical scales of a profile: *As you have learn above that the horizontal distance and height in a profile is shown by different scale. Therefore, the actual volume of the gradient on the surface is not represented by the Profile. It is absolutely necessary for the horizontal and vertical scales to be uniform in order to display the actual volume of the gradient, but doing so makes it difficult to clearly represent the top and bottom parts. For example, if the height of a map on scale Rf is 1: 100,000 displayed at the same scale, it would be sufficient to elevate the profile only by 1/5 cm above the baseline to show a 200 m high mountain peak. Thus its clear that identification of a hill top in the profile would be a difficult task. To overcome this difficulty, use a larger scale than the horizontal scale to display the height in the Profile and write down the exaggeration of the vertical scale below the Profile (see figure no. 2).*

In the vertical scale, the exaggeration in vertical scale is determined according to the following formula:

Exaggeration in vertical scale = vertical scale / horizontal scale

For example, if the horizontal scale of a column is 1: 150,000 and the vertical scale is 1: 25,000, then the deformation in the vertical scale is

=1/25,000 ÷ 1/150,000

=1/2500×150,000/1

=6 times

Classification of Profiles

The changes of the gradient occurring from place to place in a site form cannot be explained by just one column or section. Therefore, for proper representation of gradient transformation, it is necessary to draw different lines according to each line, by drawing some simple and mutually parallel lines at the same distance at the contour-oriented map of that site. Circles drawn using different lines can be represented by four forms of Profiles

I. *Serial Profiles,*
II. *Superimposed Profiles,*
III. *Projected Profiles*
IV. *Composite Profiles.*

The difference of the above types of the profiles, its construction and exercises will be explained in next content.

Model Exercises:

Q1. What is Profiles? Examine the difference between Section and Profile and illustrate it with suitable diagram.

Q2. Define the different methods of profile construction and establish it's importance in relief and geomorphic studies.