

Topographical Maps

* Introduction →

- You know that the map is an important geographical tool. You also know that maps are classified on the basis of scale and functions. They serve the purpose of base maps and are used to draw all the other maps.
- Topographical maps also known as general purpose maps, are drawn at relatively large scales. These maps show important natural and cultural features such as relief, vegetation, water bodies, cultivated land, settlements and transportation networks etc.
- These maps are prepared and published by the National Mapping Organisation of each country. For eg → The Survey of India prepares the topographical maps in India for the entire country.
- The topographical maps are drawn in the form of series of maps at different scales. Hence, in the given series, all maps employ the same reference point, scale, projection, conventional signs, symbols and colours.

The topographical maps in India are prepared in two series i.e. India and Adjacent Countries Series and The International Map Series of the world

① India and Adjacent Countries Series: Topographical Maps under India and Adjacent Countries Series were prepared by the Survey of India till the coming into existence of Delhi Survey Conference in 1957.

Henceforth, the preparation of maps for the adjoining countries was abandoned and the survey of India confined itself to prepare and publish the topographical maps for India as per the specifications laid down for the International Map Series of World.

The topographical maps are prepared on 1: 10,00,000, 1: 25,00,000, 1: 1,25,000, 1: 50,000 and 1: 25,000 scale providing a longitudinal and longitudinal coverage of 4x4, 1x1, 30'x30', 15'x15' and 5'x7'30" respectively.

(b) International Map Series of the World: Topographical Maps under International Map Series of the World are designed to produce standardised maps for the entire world on a scale of 1: 10,00,000 and 1: 25,00,000

* Toposheets \Rightarrow

Toposheets is a topographic map which is a two-dimensional representation of a three-dimensional land surface

Topographic maps are differentiated from other maps in that they show both horizontal and vertical position of terrain

Through a combination of contour lines, colours, symbols, labels and other graphical representation.

Topographic maps portray the shapes, location of mountains and many other graphical representation.

- Topographic maps portray the shapes, location of mountains, and many other natural and manmade features
- Topographic maps show natural and cultural features as well.


- To identify a map of a particular area, a map numbering system has been adopted by Survey of India.

- Toposheets classified according to scale:

- 1 Large scale maps: Scale 1 in 1000 or less than 1000
- 2 Small scale maps: Scale 1 in 10000 or greater than 10000
- 3 Medium scale maps: Scale from 1 in 1000 to 1 in 10000

* Uses :

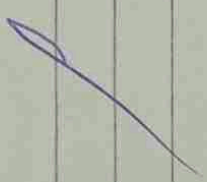
- 1- Firstly, toposheet contains valuable reference information for surveyors.
- 2- It is also map makes including bench mark, baseline and meridian and are used in civil engineers.
- 3- It is also used as environmental managers and urban planners as well as by emergency service agencies and historians.
- 4- Toposheet are extremely useful for planning various projects.
- 5- As they provide the required data in most convenient form so that the construction can be planned.
- 6- One can use toposheets for planning of a building complex, an industrial plant, a railway and an irrigation project.
- 7- One can plan Bridges, tunnels and dams from the toposheets.

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- 8- One can use them for the development of hydroelectric schemes, landscape, architecture, environmental protection and agriculture.
- 9- One uses it in earth science and many other geographic disciplines mining and other earth-based endeavours.
- 10- These are also helpful for directing military operations at time of war.

Conventional Signs and Symbols

- Features which have so repeatedly represented on maps are depicted by special signs and symbols.
- The signs bear some pictorial resemblance to the original features and their meaning is quite clear. Some conventional signs need to be studied closely before they can be recognised.



* Contours \Rightarrow

- Contours are imaginary lines joining places having the same elevation above mean sea level. A map showing the location of an area by contours is called contour map. The method of showing relief features through contour is very useful and versatile. The contour lines on a map provide a useful insight into the topography of an area.

- Earlier, ground surveys and levelling methods were used to draw contours on topographical maps. However, the invention of photography and subsequent use of aerial photography have replaced the conventional methods of surveying, levelling and mapping. Henceforth these photographs are used in topographical mapping.

- Contours are drawn at different vertical intervals like 20, 50, 100 meters above the mean sea level. It is known as contour interval. It is usually constant on a given map. It is generally expressed in metres. While the vertical interval between the two successive contour lines remains constant, the horizontal distance varies from place to place depending upon the nature of slope. The horizontal distance is also known as the horizontal equivalent (HE), is large when the slope is gentler and decreases with increasing slope gradient.

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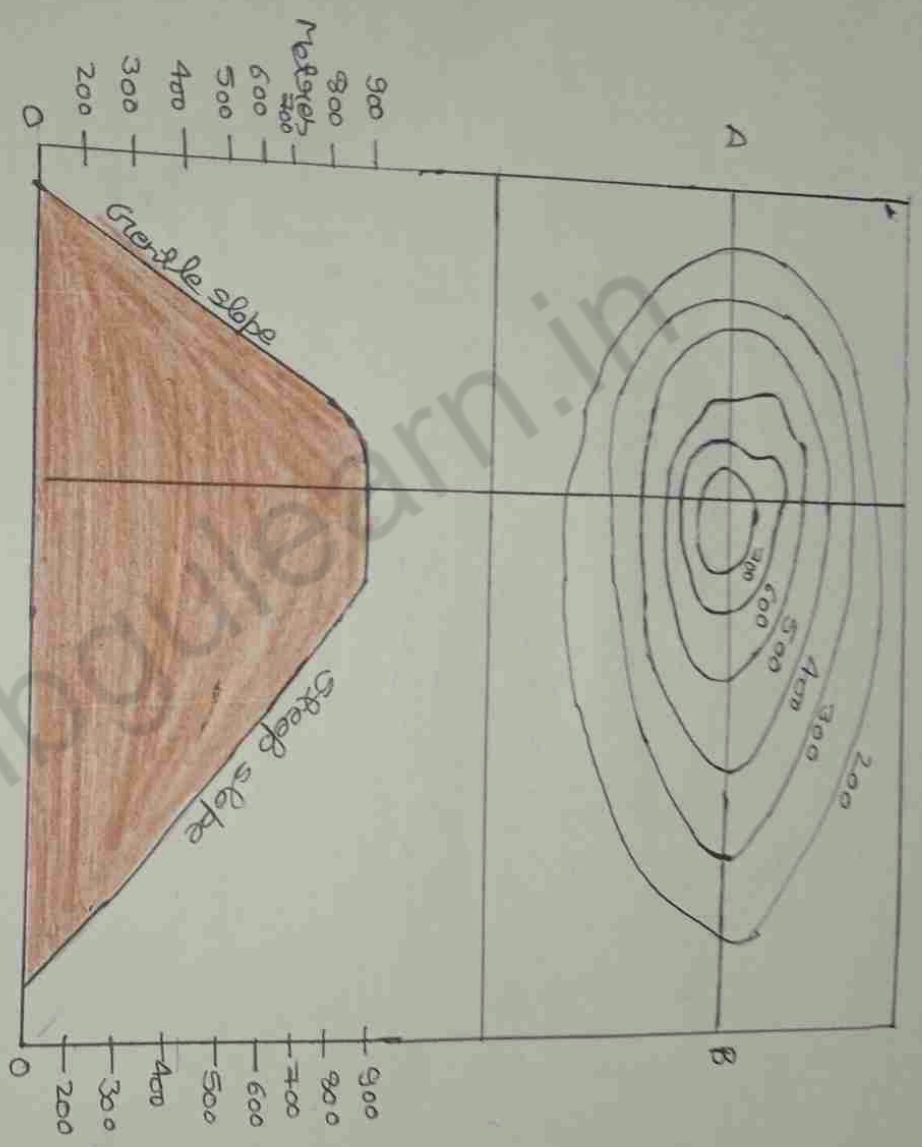
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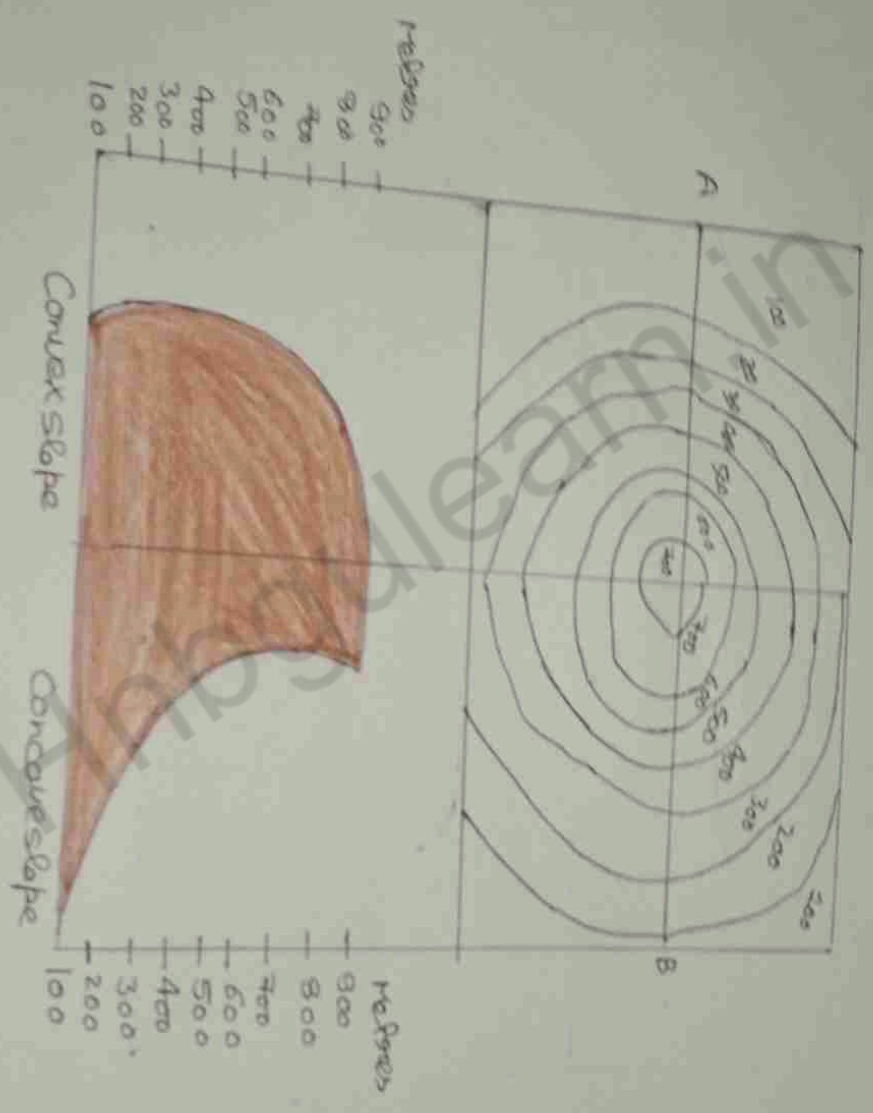
* Some basic features of contour lines are

- 1- A contour line is drawn to show places of equal height.
- 2- Contour lines are and their slopes represent the height and slope or gradient of the landform.
- 3- Closely spaced contours represent steep slopes while widely spaced contours represent gentle slope.
- 4- When two or more contour lines merge with each other, they represent features of vertical slopes such as cliffs or waterfalls.
- 5- Two contours of different elevation usually do not cross each other.

* Drawing of contours and their Cross Sections

We know that all the topographical features show varying degrees of slope. For example, a flat plain exhibits gentle slopes and the cliffs and gorges are associated with the steep slopes. Similarly, valleys and mountain ranges are also characterized by varying degree of slopes, i.e. steep to gentle. Hence, the spacing of contours is significant since it indicates the slope.





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1] Gentle slope \Rightarrow

- When the degree or angle of slope of a feature is very low, the slope will be gentle. The contours representing this type of slope are far apart.
- This even spacing is maintained in both up and down slope.

2] Steep slope \Rightarrow

- When the degree or angle of slope of a feature is high and the contours are closely spaced, they indicate steep slope.

3] Concave slope \Rightarrow

- A slope with a gentle gradient in the lower parts of a relief feature and steep in its upper parts is called the concave slope.
- Contours in this type of slope are widely spaced in the lower parts and are closely

4] Convex slope \Rightarrow

- Unlike concave slope, the convex slope is fairly gentle in the upper part and steep in the lower part.
- As a result, the contours are widely spaced in the upper parts and are closely spaced in lower parts.

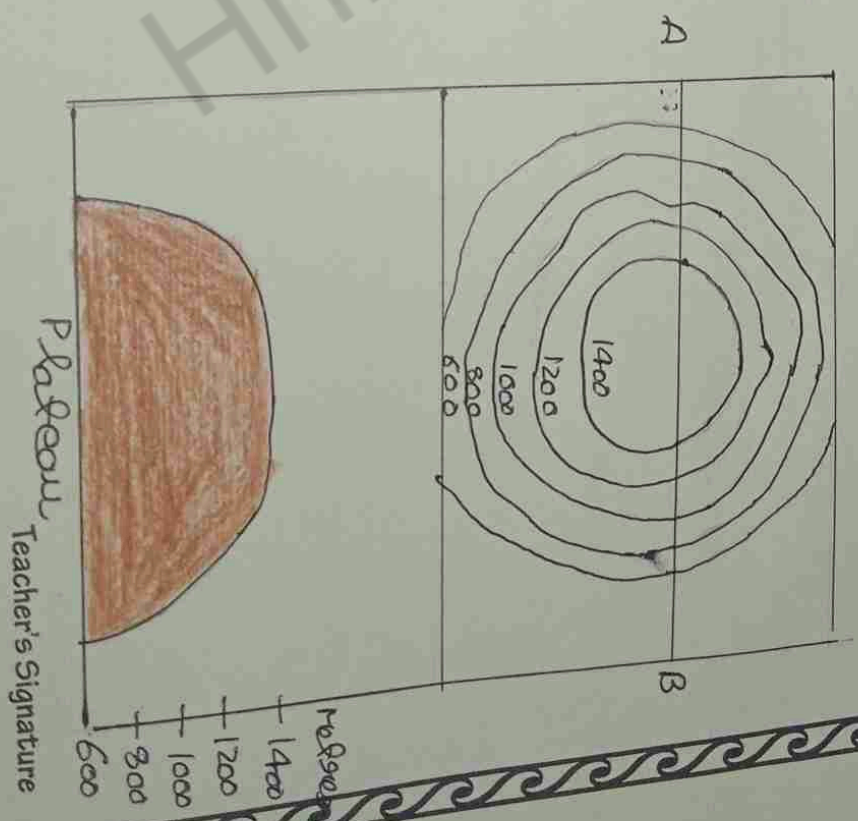
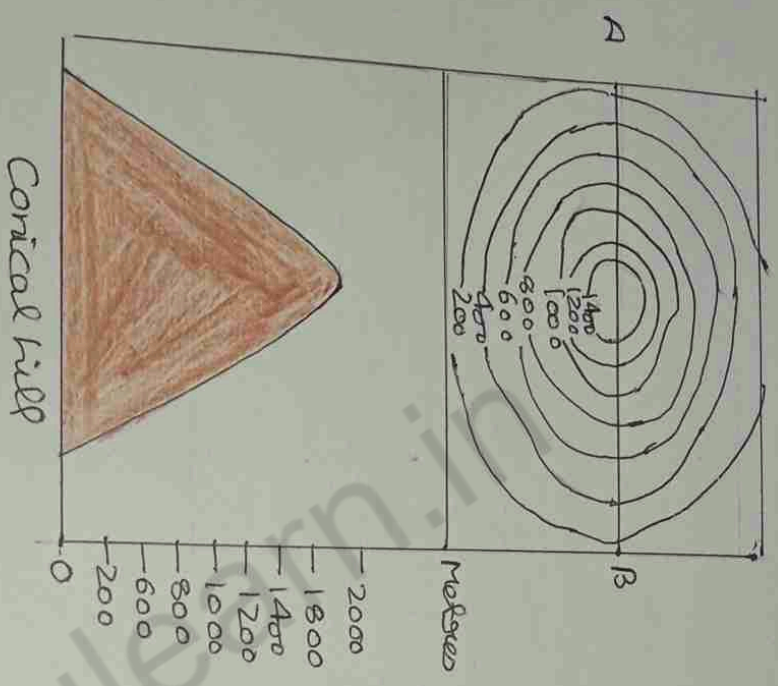
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[1] Circular Hill, \rightarrow

- It occurs almost uniformly from the surrounding land.
- A circular hill with uniform slope and narrow top is characterized by concentric contours spaced almost at regular intervals.

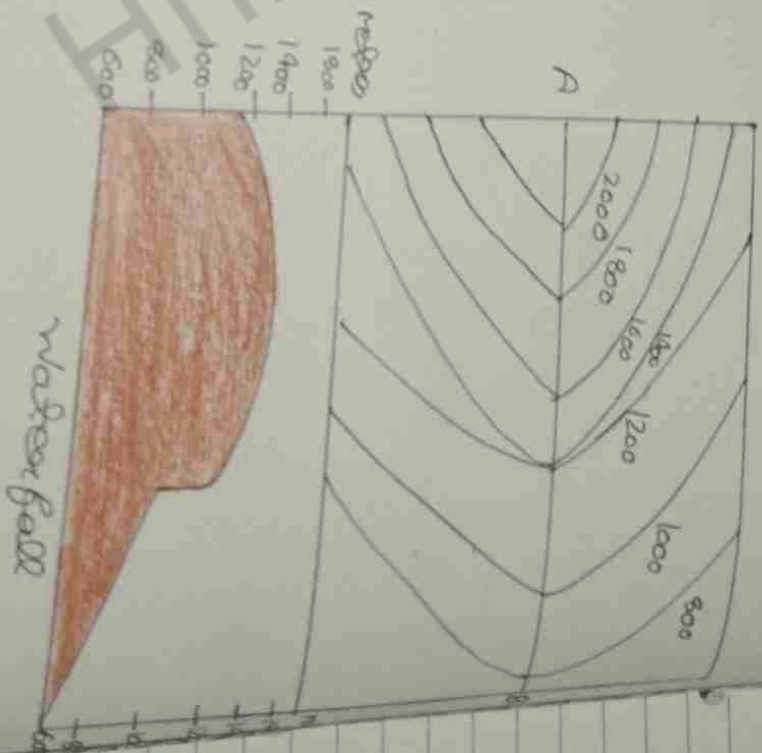
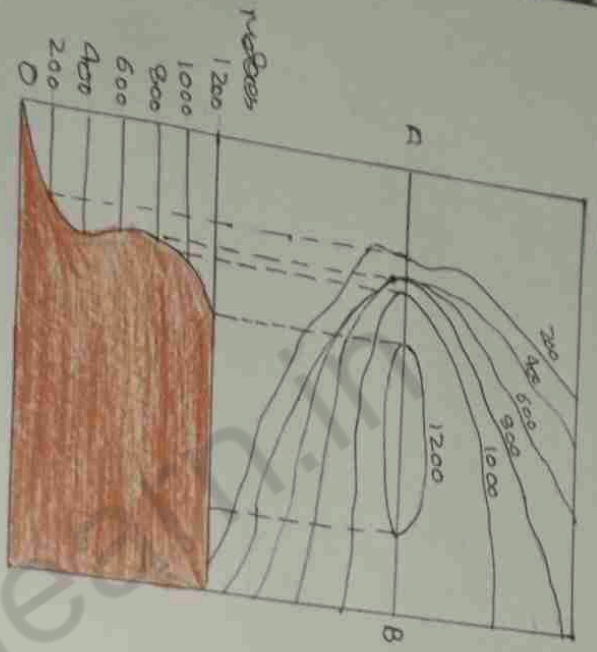
[2] Pleasant \rightarrow

- A widely stretched base - topped high land, with relatively steep slopes, rising above the adjoining plain or sea is called a pleasant. The contour lines representing a pleasant are normally close spaced at the margins with the innermost contour showing wide gap b/w its two sides.



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waterfall

Cliff

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Sumit

1] Cliff ⇒

- It is a very steep or almost perpendicular face of landform.
- On a map, a cliff may be identified by the way the contours turn very close to one another, ultimately merging into one.

2] Waterfall ⇒

- A sudden and more or less perpendicular descent of water from a considerable height in the bed of a river is called a waterfall.
- The contours representing a waterfall merge into one another while crossing a river stream.

Ridge

[1]

Characteristics →

On a map, a ridge is depicted as two contour lines (often of the same contour) turning side by side at the same elevation for some distance.

When the lines diverge, the ridge is either flattening out to a high plateau or continues to rise with additional contour lines.

[2]

Escarpment ⇒

An escarpment is an abrupt, comparatively long and regular steep face of a hill or ridge.

It has close contour lines on one side which gradually thin out of the other side.

The steep side forms the escarpment and the gentle side forms the dip. The entire region is called the escarpment.

Handwritten mark

Handwritten mark

(1)

Saddle :

- A narrow, U-shaped valley or depression with a concave floor.
- It is formed by the erosion of mountains or hills.
- The saddle is usually formed by the erosion of the mountains.
- It is usually formed by the erosion of the mountains.

(2)

Saddle :

- A saddle is a low point between two areas of higher ground.
- A saddle is also known as a col or a dip.
- A saddle is usually formed by the erosion of the mountains.
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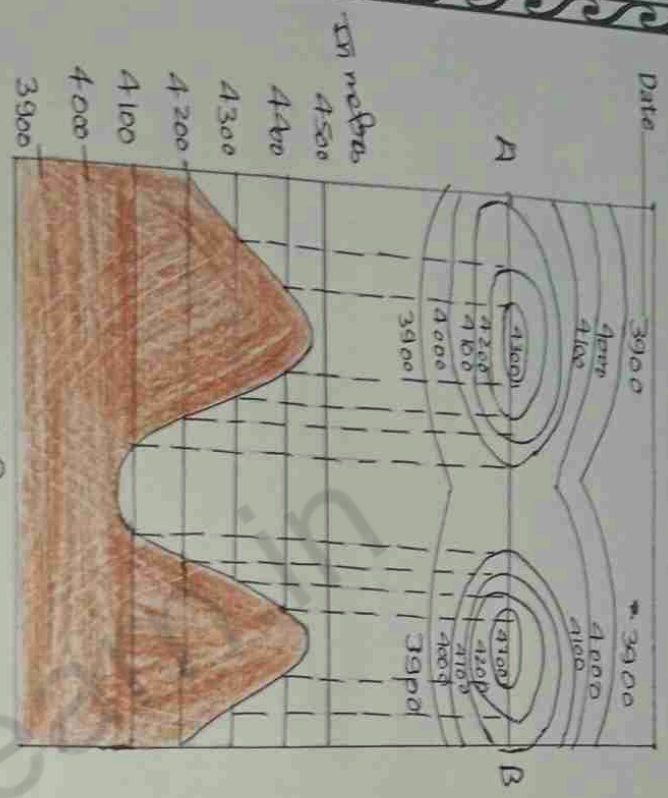
1] Pass →

- A mountain pass is a navigable route through a mountain range or over a ridge.
- Since most of the world's mountain ranges have parallel foldable belts, the passes have played a key role in trade since and both human and animal migration through history.
- At lower elevation it may be called a hill pass. A mountain pass is typically formed by two volcanic peaks or created by erosion from a or wind.

2] Col ⇒

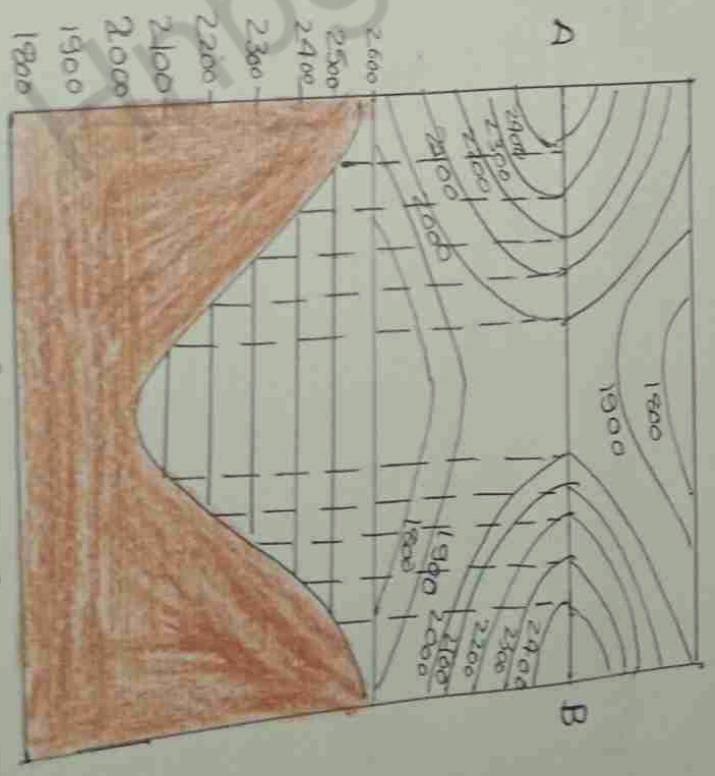
- A col is a saddle like gap in an arete. A col is the lowest point on a mountain ridge b/w two peaks.
- It is formed by headward extension of two glacial cirques from each other which create a gap in an arete.

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[1] Spur ⇒

- A tongue of land, projecting from higher ground into the lower is called a spur.
- It is represented by V-shaped contours but in the reverse manner.
- The arms of the V point to the higher ground and the apex of 'V' is the lower one.

[2] Valley ⇒

- A geometric feature lying between the two hills or ridges and formed as a result of the lateral erosion by a river or glacier is called a valley.
- It is of two type ⇒ V shaped valley, U shaped valley
- V shaped valley occurs in mountainous areas
- U shaped valley is formed by strong lateral erosion of glaciers at high altitude.

1] V shaped valley \Rightarrow

It resembles the letter 'V'. A V-shaped valley occurs in mountainous areas.

- The lowermost part of V-shaped valley is shown by innermost contour line with very small gap between its two sides and the lowest valley of contour is assigned to it.

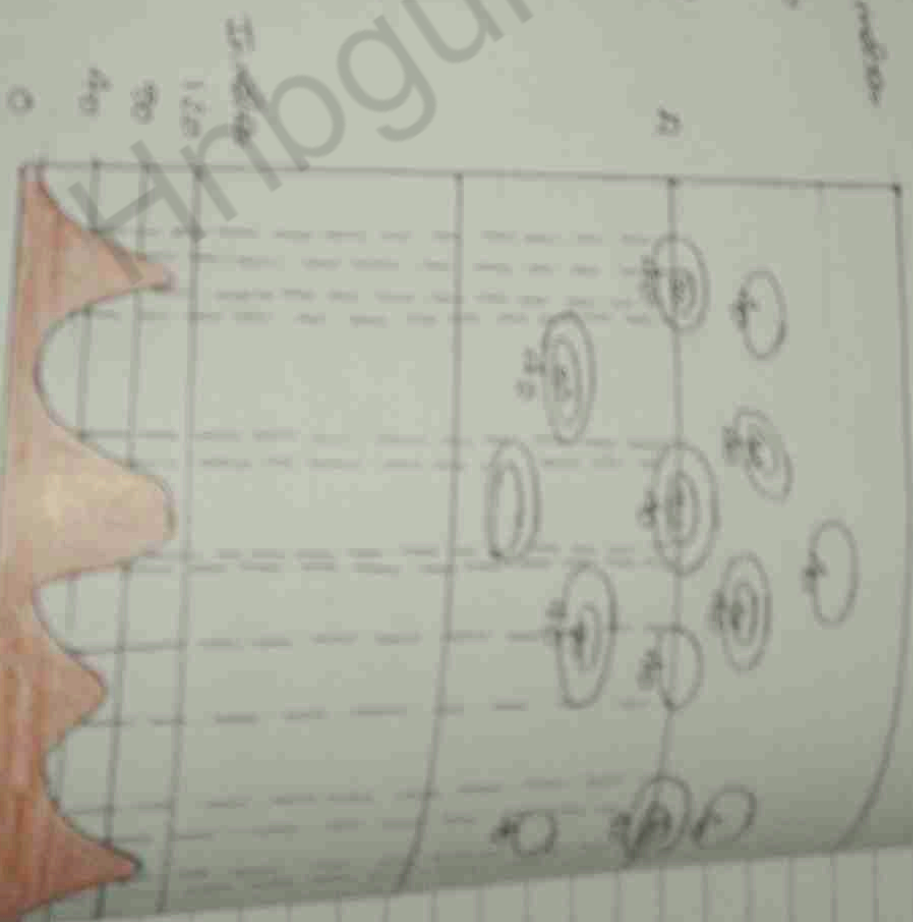
- The contour value increases with uniform intervals for all other contour lines outward.

2] U shaped valley \Rightarrow

- A U-shaped valley is formed by strong lateral erosion of glaciers at allitude. The flat wide bottom and steep sides make it resemble the letter 'U'.

- The lowermost part of U-shaped valley is shown by innermost contour line with wide gap between its two sides.

- The contour value increases with uniform intervals for all other contour lines outward.



Sound clouds

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[1] Gorge ⇒

- In high altitudes, gorges form in the areas where the vertical erosion by river is more prominent than the lateral erosion.
- They are deep and narrow river valleys with very steep sides.
- A gorge is represented by very closely-spaced contour lines on a map with numerous contour showing small gaps between the two sides.

[2] Sand dunes ⇒

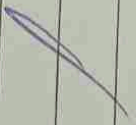
- A dune is a landform composed of wind or water driven sand. It typically takes the form of a mound, ridge, or hill.
- An area with dunes is called a dune system or a dune complex. Dunes occur in different shapes and sizes, but most kinds of dunes are larger on stoss (upwind) side where the sand is pushed up the dune, and have a steeper slip face in lee side. The valley or trough between dunes is called a dune slack.

1] River Gaps ⇒

- A river gap is a gap that flowing water has carved through a mountain range or mountain ridge and that still carries water today.
- Such gaps that no longer carry water currents are called wind gaps.

2] Lake ⇒

- A lake is an area filled with water, localized in a basin, surrounded by land and distinct from any river or other outlet that carries its feed or drain the lake.
- Lakes lie on land and are not part of the ocean, although, like much larger oceans, they do not form part of Earth's water cycle.



1

River meander ⇒

- A meander is one of a series of regular sinuous curves in the channel of river or other watercourse.
It is produced as a watercourse erodes the sediments of an outer, concave bank and deposits ^{being} sediments on an inner, convex bank which is typically a bar.

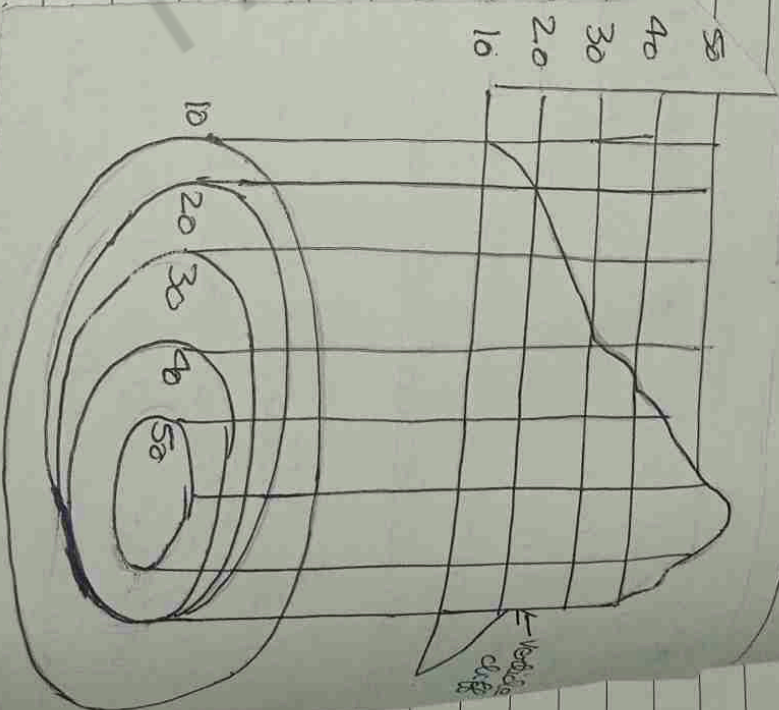
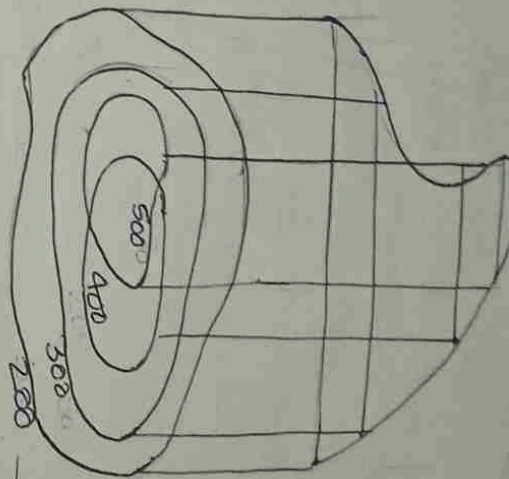
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River terraces ⇒

- Terraces can be formed in many ways and in several geological and environmental settings.
By studying the size, slope, and age of terraces, one can determine the geologic processes that formed them.

- 1. Overlapping cliff ⇒
Two contour lines of different elevation cross each other in that case.
If contour lines cross each other it shows the existence of overhanging cliff or a cave.

- 2. Vertical cliff ⇒
Contour lines of different elevations unite to form one line.



Vertical cliff

Mirzapur Interpenetration

The top sheet shows a large part of Mirzapur district of Uttar Pradesh. The given area is largely rural. A large part of map is indicated by yellow wash which indicates cultivable land.

1- Relief features ⇒Ganga Plains

It extends on both sides of meandering course - River Ganga. The average elevation is about 100m above the sea level. The BR 84m lies in eastern part of Mirzapur. The bank of the River are marked by sandy shalts. The River has several tributaries such as Chaker Nadi and Ujhala Nadi and have canals like Kharjuri brought which shows the significance of agriculture in the area.

Drainage

The main stream of area is Ganga which has several tributaries. The flow of the is seasonal as Baram ground can be seen on the bank. Baran like dendritic pattern can be seen.

Vegetation

The northern part mostly lacks of vegetation. The southern part has two main reserved forest i.e. Danti Reserve forest and the Barabaha Reserve forest. The rest of the area has scattered vegetation.

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Settlement

The most important town of area is Mirzapur with nucleated settlements located on the southern part of Raies Ganga. Other than this the whole area has dispersed settlements. Large no of monuments like mosque and Dargahs can be seen which make the area look densely populated. Mirzapur town has its major collecting and distributing centre region.

Transport

The area is well connected by roads. Many of which are national highway line can also be seen. The river can be easily crossed through ferries.

Occupation

Since the several settlements are scattered throughout the regions the main human occupation is Agriculture. The ganga plain provide extensive cultivable land. Other occupation includes business, communication, manufacturing industries.

Tourism

Tourism can be developed in Mirzapur as there are many temples and pilgrims areas.

Small

Small

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Green Hills

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