NCERT SOLUTIONS

CLASS - 11th



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Class : 11th

Subject : Geography

Chapter : 7

Chapter Name : Landforms and their evolution

Q1 Multiple choice questions.

(i) In which of the following stages of landform development, downward cutting is dominated?

(a) Youth stage

(b) Late mature stage

(c) Early mature stage

(d) Old stage

(ii) A deep valley characterized by steep step-like side slopes is known as

(a) U-shaped valley

(b) Gorge

(c) Blind valley

(d) Canyon

(iii) In which one of the following regions the chemical weathering process is more dominant than the mechanical process?

(a) Humid region

(b) Limestone region

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(c) Arid region

(d) Glacier region

(iv) Which one of the following sentences best defines the term ‘Lapies’ ?

(a) A small to medium sized shallow depression

(b) A landform whose opening is more or less circular at the top and funnel shaped towards bottom

(c) A landform formed due to dripping water from surface

(d) An irregular surface with sharp pinnacles, grooves and ridges

(v) A deep, long and wide trough or basin with very steep concave high walls at its head as well as in sides is known as:

(a) Cirque

(b) Glacial valley

(c) Lateral Moraine

(d) Esker

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Answer.

i- (c) Early Mature stage

ii- (d) Canyon

iii- (b) Limestone region

iv- (d) An irregular surface with sharp pinnacles, grooves and ridges

v- (a) Cirque

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Q2 Answer the following in about 30 words

(i) What do incised meanders in rocks and meanders in plains of alluvium indicate?

(ii) Explain the evolution of valley sinks or uvalas

(iii) Underground flow of water is more common than surface run-off in limestone areas. Why?

(iv) Glacial valleys show up many linear depositional forms. Give their locations and Names.

(v) How does wind perform its task in desert areas? Is it the only agent responsible for the erosional features in the deserts?

Answer.

(i) The incised meanders in rocks and meanders in plains of alluvium gives an indication on the status of original land surfaces over which streams have developed.

(ii) Generally, the surface run-off simply goes down swallow and sink holes and flow as underground streams and re-emerge at a distance downstream through a cave opening. When sink holes and dolines join together because of slumping of materials along their margins or due to roof collapse of caves, long, narrow to wide trenches called valley sinks or uvalas form.

(iii) Underground flow of water is more common than surface run- off in limestone areas because limestone is rich in calcium carbonate, the surface water as well as groundwater through the chemical process of solution and precipitation deposition develop varieties of landforms. These two processes of solution and precipitation are active in limestones or dolomites occurring either exclusively or interbedded with other rocks.

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(iv) Glacial valleys show up many linear depositional forms. Their locations and Names are as follows:

a. Terminal moraines: formed at the end (toe) of the glaciers.

b. Lateral moraines form along the sides parallel to the glacial valleys.

c. Eskers: flow over the ground with ice forming its banks.

d. Drumlins: form beneath heavily loaded ice through fissures in the glacier.

(v) Winds also move along the desert floors with great speed and the obstructions in their path create turbulence. There are storm winds as well which are very destructive. Winds cause deflation, abrasion and impact. Deflation includes lifting and removal of dust and smaller particles from the surface of rocks. In the transportation process sand and silt act as effective tools to abrade the land surface. The impact is simply sheer force of momentum which occurs when sand is blown into or against a rock surface. It is similar to sand- blasting operation. The wind action creates a number of interesting erosional and depositional features in the deserts. No, wind is not the only agent responsible for the erosional features in the deserts. Wind is one of the two dominant agents in hot deserts. The other one is rain or sheet wash.

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Q3 Answer the following in about 150 words :

(i) Running water is by far the most dominating geomorphic agent in shaping the earth's surface in humid as well as in arid climates. Explain.

(ii) Limestones behave differently in humid and arid climates. Why? What is the dominant and almost exclusive geomorphic process in limestone areas and what are its results?

(iii) How do glaciers accomplish the work of reducing high mountains into low hills and plains?

Answer.

(i) In humid regions, there are two components of running water ; one is overland flow on general land surface as a sheet; another is linear flow as streams and rivers in valleys. Most of the erosional landforms made by running water are associated with vigorous and youthful rivers flowing over steep gradients. With time, stream channels over steep gradients turn gentler due to continued erosion, and as a consequence, lose their velocity, facilitating active deposition. Overland flow further, causes sheet erosion. Depending upon the irregularities of the land surface, the overland flow may concentrate into narrow to wide paths. In the early stages, down-cutting dominates during which irregularities such as waterfalls and cascades will be removed. In the middle stages, streams cut their beds slower, and lateral erosion of valley sides become severe. That means, the weathered debris in deserts is moved by not only wind but also by rain/sheet wash.

In arid regions, though rain is scarce in deserts, it comes down torrentially in a short period of time. The desert rocks which are devoid of vegetation and are exposed to mechanical and chemical weathering decay faster and the torrential rains helps removing the weathered materials. In humid areas running water creates a variety of landforms (aided by others) such as valleys, gorges, etc. in the highlands. Hill slopes which are devoid of trees are eroded to form rills and gullies. It creates extensive depositional plains in its lower course where the process of deposition becomes dominant. Thus, running water is by far the most dominating geomorphic abd denudational agent, in shaping the earth's surface in humid as well as in arid climates.

(ii) Limestones are permeable, thinly bedded and highly jointed and cracked thus, the surface water percolates well. The chief chemical in limestone is calcium carbonate which is easily soluble in carbonated water i.e. carbon dioxide absorbed rainwater. This

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calcium carbonate is deposited when the water carrying it in solution evaporates or loses its carbon dioxide as it trickles over rough rock surfaces. Stalactites, Stalagmites and Pillars Stalactites hang as icicles of different diameters. Normally they are broad at their bases and becomes taper towards the free ends showing up in a variety of forms. Stalagmites rise up from the floor of the caves. In facts, stalagmites form due to dripping water from the surface or through the thin pipe, of the stalactite, immediately below it. In arid climates, water table is below the surface therefore, limestones behave differently in humid and arid climates. The amount of water differes in these two areas, therefore limestones behave differently in humid and arid climates. The results of the work of groundwater cannot be seen in all types of rocks. But in rocks like limestones or dolomites rich in calcium carbonate, the surface water as well as groundwater through the chemical process of solution and precipitation deposition develop varieties of landforms. These two processes of solution and precipitation are active in limestones or dolomites occurring either exclusively or interbedded with other rocks. Therefore, underground flow of water is more common than surface run off in limestones areas.

(iii) Masses of ice moving as sheets over the land or as linear flows down the slopes of mountains in broad trough-like valleys are called glaciers. A glacier in its valley is slow unlike water flow. The movement could be a few centimetres to a few metres a day or even less or more. Glaciers move basically because of the force of gravity. Erosion by glaciers is tremendous because of friction caused by sheer weight of the ice. The material plucked from the land by glaciers get dragged along the floors or sides of the valleys and cause great damage through abrasion and plucking. Glaciers can also cause significant damage to even unweathered rocks and can reduce high mountains into low hills and plains. As glaciers continue to move, debris gets removed, divides get lowered and eventually the slope is reduced to such an extent that glaciers will stop moving leaving only a mass of low hills and vast outwash plains along with other depositional features.

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