7. Geography Landforms and their Evolution

1. 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

Answer: (a) Youth stage

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

(a) U-shaped valley

(b) Gorge

(c) Blind valley

(d) Canyon

Answer: (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
(c) Arid region
(d) Glacier region

Answer: (a) Humid 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

Answer: (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

Answer: (a) Cirque

2. Answer the following questions in about 30 words

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

Answer: Meandering courses are found over floodplains and delta plains indicate that a former floodplain with a widening stream had been uplifted, enabling the stream to cut downward. Incised meanders are occur when a river's base level has fallen giving the river a large amount of vertical erosion power, allowing it to downcut. They give an indication on the status of original land surfaces over which streams have developed.

(ii) Explain the evolution of valley sinks or uvalas.

Answer: When sinkholes 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. Why?

Answer: Underground flow of water is more common than surface run-off in limestone areas because limestone areas have such rocks, which are permeable, thinly bedded and highly jointed and cracked.

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

Answer: Moraines and eskers are important linear depositional forms of a glaciated region. Lateral moraines form along the sides parallel to the glacial valleys. Medial moraines are formed at the confluence of two glaciers. Terminal moraines are found at the end of the valley glacier. When glaciers melt in summer, the water flows on the surface of the ice. Eskers are sinuous ridges formed by the depositional work of a glacier.

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

Answer: The work of wind is more prominent in arid and semi arid areas, where soil particles are loose due to lack of moisture and vegetation. A plenty of loose material is provided to be picked up by the blowing wind. Winds cause deflation, abrasion, and impact. The wind action creates a number of interesting erosional and depositional features in the deserts. Rainfall and Stream channels in desert areas are broad, smooth, and indefinite and flow for a brief time after rains.

3. Answer the following questions 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.

Answer: Running water or river is the most prominent agent of change in humid areas receiving heavy rainfall. As the rainfall occurs, water flows down the slope of the land and removes upper layers of the earth in the direction of water flow. Gradually small and narrow sills are formed which develop into gullies. The gullies further deepen, widen, lengthen, and unite to form a network of valleys. In the upper state of river, down cutting dominates during which irregularities are removed. In the middle stage, river cut their beds slower and lateral erosion becomes dominant. At a later stage, the valley sides are reduced to lower and lower slopes. Similarly, the divides between drainage basins are lowered until they are almost completely flattened. This type of plain forming because of stream erosion is called a peneplain. The work of a river can be divided into three stages- youth, mature and old. In dry areas, there is more down cutting because sides of the valley are not eroded due to lack of rainfall. In such areas landforms likes gorges and canyons are formed. The Valley of Kaveri River near Hogenekal, Dharmapuri district, Tamilnadu is one such example.

(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?

Answer: Limestones behave differently in humid and arid climates because there is change in climate. In humid climate, surface water percolates in the limestone rocks. After some time, the underground water flows horizontally through the bedding planes and joints. The downward and horizontal movement of water erodes rocks. The surface water and the groundwater through chemical process of solution and precipitation deposition develop a variety of landforms. Limestone does not suffer much solution, erosion, and chemical reaction in dry climate due to lack of water. However, in dry areas, much water does not percolate in limestone rocks and the work of underground water is insignificant in such area.

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

Answer: A glacier does the work of erosion, transportation, and deposition on the surface of the earth and forms a variety of landforms. The glacier is always loaded with rock material from top to bottom. This material is called a drift or boulder and acts as erosive tool of the glacier. Much of it is unsorted and angular. It helps the ice in scouring, scratching, or plucking the rocks. Because of this, the rocks get polished and there are grooves and striation marks on their faces. Erosion by glacier is tremendous because of friction caused by sheer weight of the ice. The material plucked from the surface by glacier gets dragged along the floors or sides of the valleys and cause great damage through abrasion and plucking. Glaciers can cause significant damage to even un-weathered rocks and can reduce mountains into low hills, plateau and plains.