2. Lithosphere – II Exogenetic Processes

Exercise

1 A. Question

Choose the best answer.

The disintegration or decomposition of rocks is generally called as _____.

A. Weathering

B. Erosion

C. Transportation

D. Deposition

Answer

Weathering is the disintegration, breaking down and decomposition of components in the earth's crust through the action of natural or other agents. Weathering can occur due to exposure to the earth's atmosphere. Weathering is controlled and determined by various factors like temperature, rainfall, vegetation and movements of other components in the earth's crust. Weathering can be physical, chemical or biological.

1 B. Question

Choose the best answer.

The process of levelling up of lands by means of natural agents is_____.

A. Aggradation

B. Degradation

C. Gradation

D. None

Answer

Gradation is the process of levelling up and formation of land surface by the operation of natural agents like air, water, glaciers or sea waves. The action of these agents results in the formation of various geographical features and structures with the passage of time. It is a highly time-consuming process and can result in the formation of sea cliffs, canyons, waterfalls and various

other landforms. It occurs because of the combined action of erosion, transportation and deposition.

1 C. Question

Choose the best answer.

_____ is seen in the lower course of river.

A. Rapids

B. Alluvial fan

C. Delta

D. Gorges

Answer

The lower course marks the journey of river mainly in the plains loaded with sediments, minerals and huge amounts of debris. This debris is deposited and accumulated in the low-lying river beds resulting in the formation of very fertile soil. This deposition and accumulation of components result in the formation of deltas. Typically, deltas will be triangular shaped that is formed at the low-lying mouth of rivers. It will contain huge volumes of mineral and sediment deposits. The Ganga-Brahmaputra delta is the largest in the world.

1 D. Question

Choose the best answer.

Karst topography is formed due to the action of

A. Glacier

B. Wind

C. Sea waves

D. Groundwater

Answer

The underground water is the major reason for the formation of the karst topography. It is formed due to the dissolution of limestone, dolomite and gypsum with the groundwater. It is created because of the gradation, erosion and deposition of these soluble rocks with the groundwater. The Nullarbor in the Great Australian Coast is the world's largest karst area.

1 E. Question

Choose the best answer.

Which of the following is not a depositional feature of a glacier?

A. Cirque

B. Moraines

C. Drumlins

D. Eskers

Answer

Erosion and deposition are also caused by the actions of glaciers. Glaciers are huge masses of snow that is transported, accumulated and deposited in other regions due to the action of natural agents. Cirque is not a depositional feature of the glacier. It is an erosional feature that erodes and moves through the steep areas and cliffs of the mountains to form a bowl-shaped depression in the surface. Thus it is an erosional feature resulting in the movement of glaciers to places in which later they are deposited.

1 F. Question

Choose the best answer.

Deposits of fine silts blown by wind is called as _____.

A. Loess

B. Barchans

C. Drumlins

D. Eskers

Answer

Erosion and deposition are also caused by the actions of wind. Many geographical features are created by the actions of wind. Loess refers to the deposition and accumulation of the fine silt and porous sand over the regions by the action of the blowing winds. It is largely found in the deserts and arid regions. The loess plateau in China has the densest deposit of loess in the world.

1 G. Question

Choose the best answer.

Stacks are formed by _____.

A. Wave erosions

B. River erosion

C. Glacial erosion

D. Wind deposition

Answer

Erosion and deposition are also caused by the actions of ocean waves. It is an important agent for the creation of many geographical features. Stacks are an important feature as a result of the erosion by sea waves. Stacks are the remaining parts of the sea arch that has been completely collapsed by the action of the waves. The remaining seaward portion of the arch in the upper part is the stack. The Old Man of Hoy in Scotland is an important sea stack.

1 H. Question

Choose the best answer.

_____ erosion is responsible for the formation of Cirque.

A. Wind

B. Glacial

C. River

D. Underground water

Answer

Erosion and deposition are also caused by the actions of glaciers. Glaciers are huge masses of snow that is transported, accumulated and deposited in other regions due to the action of natural agents. Cirque is not a depositional feature of the glacier. It is an erosional feature that erodes and moves through the steep areas and cliffs of the mountains to form a bowl-shaped depression in the surface. Thus it is an erosional feature resulting in the movement of glaciers to places in which later they are deposited.

1 I. Question

Choose the best answer.

Which one of the following is a second order landform?

A. Asia

B. Deccan plateau

C. Kulu Valley

D. Marina beach

Answer

Second order landforms are the intermediate and transitional landforms. It includes the continental rises, slopes, ridges, canyons and trenches in the seabeds and continental masses, mountains, plains and plateaus in the in the surface lands. The Deccan plateau is the apt example of second order landform. It is the largest plateau in India.

2. Question

Match the following:

a. Distributaries	Glacial action
b. Mushroom rock	The action of sea wave
c. Eskers	The lower course of the river
d. Stalactites	Aeolian process
e. Cliff	Karst topography

Answer

a. Distributaries	The lower course of the river
b. Mushroom rock	Aeolian process
c. Eskers	Glacial action
d. Stalactites	Karst topography
e. Cliff	The action of sea wave

Explanation

a. The lower course marks the journey of river mainly in the plains loaded with sediments, minerals and huge amounts of debris. This debris is deposited and accumulated in the low-lying river beds resulting in the formation of very fertile soil. This deposition and accumulation of components result in the formation of deltas. Typically, deltas will be triangular shaped that is formed at the low-lying mouth of rivers. It will contain huge volumes of mineral and sediment deposits. Here the main river will get split into a number of different river channels known as distributaries.

b. Erosion and deposition are also caused by the actions of wind. Many geographical features are created by the actions of wind. Mushroom rocks or pedestal rocks are an important feature caused by the erosive action of the winds. It is basically formed in rocks having a very soft base. In such situations, the wind erodes the soft layers of the base resulting in its erosion. The bottom layers are eroded resulting in the formation of a structure having a mushroom or pedestal-like structure in the top leaving its base like a stand to support the top.

c. Erosion and deposition are also caused by the actions of glaciers. Glaciers are huge masses of snow that is transported, accumulated and deposited in other regions due to the action of natural agents. Eskers are the depositional feature of glaciers consisting of boulders, gravel and sand that is deposited by the melting water in the glaciers. The melting glacier deposits the components that it carries leading to the formation of eskers.

d. The underground water is the major reason for the formation of the karst topography. Karst is formed due to the dissolution of limestone, dolomite and gypsum with the groundwater. It is created because of the gradation, erosion and deposition of these soluble rocks with the groundwater. Stalactites are an important form of karst feature. It is formed by the gradual dripping and evaporation of water having calcite components in the caves. The calcite components after evaporation of water hang down from the ceiling forming stalactites.

e. Erosion and deposition are also caused by the actions of ocean waves. It is an important agent for the creation of many geographical features. Cliffs are an important feature as a result of the erosion by sea waves. They are formed by the forceful dashing and blowing off the sea waves against the adjacent rocks. This results in the formation of steep vertical walls called cliffs.

3 A. Question

Answer in brief.

Define weathering.

Answer

Weathering is the disintegration, breaking down and decomposition of components in the earth's crust through the action of natural or other agents.

Weathering can occur due to exposure to the earth's atmosphere. Weathering is controlled and determined by various factors like temperature, rainfall, vegetation and movements of other components in the earth's crust. Glacier, wind, rivers, ocean waves and groundwater are the major agents of weathering. Weathering can be physical, chemical or biological.

3 B. Question

Answer in brief.

What do you mean by biological weathering?

Answer

Weathering is the disintegration, breaking down and decomposition of components in the earth's crust through the action of natural or other agents. Weathering can occur due to exposure to the earth's atmosphere. Weathering is controlled and determined by various factors like temperature, rainfall, vegetation and movements of other components in the earth's crust. Glacier, wind, rivers, ocean waves and groundwater are the major agents of weathering. Weathering can be physical, chemical or biological.

Biological weathering occurs because of the actions of the flora, fauna and human interferences. It results in the decomposition of the components due to the biological processes involved with the expansion of the activities of the living organisms. The growth of plants, the penetration of their roots, diffusion of rotten plant and animal cells, burrowing of animals and many other human interferences are the major causes of biological weathering.

3 C. Question

Answer in brief.

Mention the three courses of the river with any two landforms associated with each course.

Answer

The path in which a river flows from the point of origin to its destination is called the course. It can be mainly divided into three:

• Upper course- It is the starting point of the journey of the river. In this plane, the river falls down from the steep mountain slopes and cliffs. Higher the steep of the mountain, higher will be the speed and pace of the fall and greater will be the force to broaden and extend the river valley resulting in erosion of many elements. V-shaped valleys, gorges, waterfalls, canyons and rapids are the major features associated with this course.

• Middle course- In the middle course, the river pass through the sloping plains and valleys along with the particles and components like sand, slits, sediments, minerals and other elements. Actions of erosion and transportation take place in the middle course. The river widens and reduces in speed because of the particles that it carries. Alluvial fans, floodplains,

meanders and ox-bow lakes are the major features associated with this course.

• Lower course- The lower course marks the journey of river mainly in the plains loaded with sediments, minerals and huge amounts of debris. This debris is deposited and accumulated in the low-lying river beds resulting in the formation of very fertile soil. Here the main river will get split into a number of different river channels known as distributaries. This deposition and accumulation of components result in the formation of deltas and estuary.

3 D. Question

Answer in brief.

What are ox-bow lakes?

Answer

The course of the river results in the formation of different geographical features. An oxbow lake is an important feature formed in the middle course of the river. In the middle course, the river passes through the sloping plains and valleys along with the particles and components like sand, slits, sediments, minerals and other elements. Actions of erosion and transportation take place in the middle course resulting in the bending and twisting of the river to form meanders.

With further deposition, erosion and re-deposition, the meanders become a complete circle. The river will become much narrower with a circular surface resulting in the formation of lakes. Such features are known as ox-bow lakes. Lake Chicot in the USA is the world's largest ox-bow lake.

3 E. Question

Answer in brief.

How does a cave differ from a sea arch?

Answer

CAVE	SEA ARCH
• Caves are formed by the action of sea waves on the cliffs resulting in erosion and breaking down of rocks.	• Arches are formed by the unification of two sea caves from either side of the headline.
• Its structure is mostly dome-like with a tunnel.	• Its structure is mostly like an opening formed with a headline at its top.
• It is formed at the base of the cliffs.	• They are formed at headlands extending to the sea.
• E.g. Fingal caves at Scotland	• E.g. Durdle Door in England

3 F. Question

Answer in brief.

List out any four karst topographical areas in India.

Answer

The underground water is the major reason for the formation of the karst topography. It is formed due to the dissolution of limestone, dolomite and gypsum with the groundwater. It is created because of the gradation, erosion and deposition of these soluble rocks with the groundwater. It results in the formation of stalactites, stalagmites, columns and pillars. The major karst areas in India are:

• Guptadham caves in Western Bihar

• Robert caves and Tapkeshwar temples in Uttarakhand

• Pandav caves Pachmarhi in Madhya Pradesh

• Kutumsar in Chattisgarh

• Borra caves of Vishakapatnam

3 G. Question

Answer in brief.

What do you mean by hanging valley?

Answer

Erosion and deposition are also caused by the actions of glaciers. Glaciers are huge masses of snow that is transported, accumulated and deposited in other regions due to the action of natural agents. Hanging valleys are the result of erosional glacial action. It is because of the erosion of the main valley by the tributary glacier. It occurs when the main valley is broadened and extended by the erosion of the glacier. It leaves the other side of the main valley cut-off from its other side resulting in hanging valleys. It results in the formation of the raid and steep waterfalls.

3 H. Question

Answer in brief.

Define: a) Moraine b) Drumlin c) Esker.

Answer

I. Moraine

Erosion and deposition are also caused by the actions of glaciers. Glaciers are huge masses of snow that is transported, accumulated and deposited in other regions due to the action of natural agents. Moraines are the result of depositional glacial action. It is formed by the deposition of the continental glaciers or valley glaciers along with the particles and debris eroded by the glacier. There are different types, sizes and shapes of moraine- ground moraine, lateral moraine, terminal moraine, medial moraine and recessional moraine.

II. Drumlin

Erosion and deposition are also caused by the actions of glaciers. Glaciers are huge masses of snow that is transported, accumulated and deposited in other regions due to the action of natural agents. Drumlins are the result of depositional glacial action. They are the result of the formation of moraines. They are the debris and particles carried by the moraines. They are the drawn-out hills of rock, sand, boulders and other elements formed with the moving glaciers. It mainly consists of glacial deposits.

III. Esker

Erosion and deposition are also caused by the actions of glaciers. Glaciers are huge masses of snow that is transported, accumulated and deposited in other

regions due to the action of natural agents. Eskers are the depositional feature of glaciers consisting of boulders, gravel and sand that is deposited by the melting water in the glaciers. The melting glacier deposits the components that it carries leading to the formation of eskers.

3 I. Question

Answer in brief.

Mention the various features formed by wind erosion.

Answer

Erosion and deposition are also caused by the actions of the wind that is blown in the earth's surface. It can result in the formation of geographical features though erosion, transportation and deposition. Many geographical features are created by the actions of wind. Some of them are:

EROSIONAL FEATURES

• Mushroom rocks or pedestal rocks- They are an important feature caused by the erosive action of the winds. It is basically formed in rocks having a very soft base. In such situations, the wind erodes the soft layers of the base resulting in its erosion. The bottom layers are eroded resulting in the formation of a structure having a mushroom or pedestal-like structure in the top leaving its base like a stand to support the top. These are found in Jodhpur, Rajasthan.

• Inselberg- They are an important feature caused by the erosive action of the winds. These are formed by the action of wind in rocks like igneous rocks that are more resistant to the action of wind. Since these rocks have more resistance against the winds, they stand rising above the surroundings forming abrupt hills and cliffs. Uluru rocks in Australia is a prominent inselberg.

• Yardang- They are an important feature caused by the erosive action of the winds. It is basically formed in rocks having a vertical soft base. In such situations, the wind erodes the vertical soft layers of the base resulting in its erosion. These soft layers get eroded leaving crests and summits. Xinjiang is a significant yardang in China.

DEPOSITIONAL FEATURES

• Loess- Loess refers to the deposition and accumulation of the fine silt and porous sand over the regions by the action of the blowing winds. It is largely found in the deserts and arid regions. The loess plateau in China has the densest deposit of loess in the world.

• Sand dunes- It is the deposition action of the wind. It is formed mainly from the sands carried during sandstorms in deserts. With the actions of wind huge amounts of sand gets carried and deposited in different places. These mounds and piles of sand deposited in different places are called sand dunes. Dune 7 in Namibia is the world’s largest sand dune.

• Barchan- It is the deposition action of the wind. It is formed mainly from the sands carried during sandstorms in deserts. They are the hemispherical and crescent-shaped dunes that have a gentle upward slope on the windward side and sharp vertical slope on the other leeward side. It is a common feature in the Sahara desert in Egypt.

• Transverse dunes- It is the deposition action of the wind. It is formed mainly from the sands carried during sandstorms in deserts. They are asymmetrical, lopsided and disjoint in nature. They are formed by the action of the subsequent blowing of fast and slow winds of the same direction. They are largely found in Medano Creek in the U.S.

• Longitudinal dunes- It is the deposition action of the wind. It is formed mainly from the sands carried during sandstorms in deserts. They are symmetrically formed dunes in the same direction as the wind blow. They are mostly even, regular and proportional. They are most common in Sahara desert.

3 J. Question

Answer in brief.

What are wave cut platforms?

Answer

Erosion and deposition are also caused by the actions of ocean waves. It is an important agent for the creation of many geographical features. Wave-cut platforms are an important feature as a result of the erosion by sea waves. The flat and level surface formed at the base of the sea cliffs by the action of waves are wave cut platforms. They are also called beach, shoreline, ledge and coastline.

4 A. Question

Distinguish between:

Physical and chemical weathering

Answer

PHYSICAL WEATHERING	CHEMICAL WEATHERING
• It is the disintegration and breaking down of components in the earth's crust through the action of physical forces.	• It is the decomposition of components in the earth's crust through chemical reactions.
• It does not change the chemical composition of rocks.	• It changes the chemical composition of rocks.
• It occurs due to the changes in temperature during the day and the night in cold and dry places.	• It occurs in the climatic conditions of the hot and humid regions of the equators, tropics and sub-tropics.
• Water, wing, pressure and other physical factors are the agents of disintegration.	• Oxygen, carbon dioxide and hydrogen are the agents of decomposition.
• Exfoliation, block disintegration and granule disintegration are the different types.	• Oxidation, carbonation, solution and hydration are the different types.

4 B. Question

Distinguish between:

Delta and estuary

Answer

DELTA	ESTUARY
• It is the flat, low-lying area formed at the mouth of the river.	• It is the water body that is formed when the river meets the sea.
• The deposition and accumulation of components, sediments, minerals and huge amounts of debris results in the formation of deltas.	• It does not carry, accumulate or deposit any components because of the constant sea waves.
• The result is the formation of fertile lands.	• They do not create any fertile lands.
• It is suitable for agricultural activities.	• It is suitable for fishing activities.
• They are formed in areas having low tides and plain surface.	• They are formed in areas with high tides and valleys.
• E.g. Ganga and Brahmaputra	• E.g. Narmada and Tapi

4 C. Question

Distinguish between:

Stalactite and stalagmite

Answer

STALACTITE	STALAGMITE
• It is formed by the gradual dripping and evaporation of water from the ceiling of caves having calcite components.	• It is formed by the accumulation of the gradual dripping water from the ceiling to the floor having calcite components in the caves.
• It hangs down from the ceiling forming stalactites.	• It rises from the floor of the cave to form a stalagmite.
• It is having a downward structure.	• It is having an upward structure.
• It will have a much thinner proportion.	• It will have a much thicker proportion.
• E.g. White Chamber of the Jeita Grotto in Lebanon	• E.g. Cave of Cueva Martin Inferno, Cuba

4 D. Question

Distinguish between:

Longitudinal and transverse sand dunes.

Answer

TRANSVERSE DUNES	LONGITUDINAL DUNES
• They are formed by the action of the subsequent blowing of fast and slow winds of the same direction.	• They are symmetrically formed in the same direction as the wind blow.
• They are asymmetrical, lopsided and disjoint in nature.	• They are mostly even, regular and proportional.
• It occurs in places with an abundant quantity of sand.	• It occurs in places with neither high nor low volume of sand.
• E.g. Medano Creek in the U.S.	• E.g. Sahara desert

4 E. Question

Distinguish between:

Inselbergs and yardangs

Answer

INSELBERGS	YARDANGS
• These are formed by the action of wind in rocks like igneous rocks that are more resistant to the action of wind.	• It is basically formed in rocks having a vertical soft base.
• Since these rocks have more resistance against the winds, they form inselbergs that stand rising above the surroundings forming abrupt hills and cliffs.	• Wind erodes the vertical soft layers of the base resulting in its erosion. These soft layers get eroded leaving crests and summits.
• They are the result of erosion of surrounding regions.	• They are the result of erosion of the base rocks.
• Mostly it is a huge formation that remains isolated.	• It can be small structures occurring in clustered groups.
• E.g. Uluru rocks in Australia	• E.g. Xinjiang in China.

4 F. Question

Distinguish between:

Continental glacier and valley glacier

Answer

CONTINENTAL GLACIER	VALLEY GLACIER
• It is formed in regions having a cold climate over years.	• It originates from snow-capped mountain ranges.
• It covers broad and vast areas.	• It covers only narrow and small areas.
• They are formed because of their longitudinal location.	• They are formed due to altitudinal and longitudinal reasons.
• The pace of erosional and depositional activities are much lesser.	• Erosional and depositional activities occur more rapidly resulting in the formation of a diverse environment.
• E.g. the Himalayas	• E.g. Greenland

4 G. Question

Distinguish between:

Spit and bar

Answer

BAR	SPIT
• It is an extended and broad deposit of sand, gravel or bud in the sea.	• It is the rim of sediment deposits in the land with the other side ending in the open water.
• It occurs parallel to the shoreline and beach.	• It occurs when there is a change in the landscape and mostly at the mouth of estuaries.
• It is formed by longshore drift where the waves lashing meets at perpendicular angles, thus moving the sediments.	• It is formed by the accumulation and deposition of materials from a water body.
• E.g. Columbia bar	• E.g. Kakinada spit

5 A. Question

Give reasons.

Chemical weathering is prominent in hot and humid zones.

Answer

Weathering is the disintegration, breaking down and decomposition of components in the earth's crust through the action of natural or other agents. Weathering can occur due to exposure to the earth's atmosphere. Weathering is controlled and determined by various factors like temperature, rainfall, vegetation and movements of other components in the earth's crust. Weathering can be physical, chemical or biological.

Chemical weathering is the decomposition of components in the earth's crust through chemical reactions. It changes the chemical composition of rocks. Oxygen, carbon dioxide and hydrogen are the agents of decomposition.

Oxidation, carbonation, solution and hydration are the different types. Chemical weathering is usually common in places with very hot and humid climates. It occurs in the climatic conditions of the hot and humid regions of the equators, tropics and sub-tropics. The action of the constant availability of water and the rising temperature is responsible for the faster weathering of rocks compared to other regions. The solution and hydration methods of chemical weathering will be most common in such climates. The reaction between the atmospheric humidity and other elements are responsible for the higher rate of weathering.

5 B. Question

Give reasons.

Silt deposits are less at estuaries than at deltas.

Answer

Delta is the flat, low-lying area formed at the mouth of the river. The deposition and accumulation of components, sediments, minerals and huge amounts of debris results in the formation of deltas. The result is the formation of fertile lands. They are formed in areas having low tides and plain surface. Thus, the absence of rapid tidal actions and the topography of the land makes the deposition and accumulation of silt in the delta.

An estuary is a water body that is formed when the river meets the sea. It does not carry, accumulate or deposit any components because of the constant sea waves. They do not create any fertile lands. Rather the area is more suitable for fishing activities. They are formed in areas with high tides and valleys. Thus the slit and other components they carry are not deposited at its mouth because of the constant actions of the sea waves. The constant lashing of the high tide and the resultant environment does not make the conditions apt for the deposition of silt.

5 C. Question

Give reasons.

The snow line is at the sea level in the polar region.

Answer

Snowline is the line demarcating between the snow-covered and snow-free areas. It is the line up to which the level of snow extends given a particular point of time. It is the amount of permanent snow. The quantity of snowfall, steepness of the topography, exposure of the area to sun, winds, their speed and velocity are some of the factors that affect the snowline.

The distance of the region from the equator also affects the determination of snow line. It is approximately 4500 m above the sea level at the equator. As one move towards the poles, the snow line at first increases and them falls steadily while approaching the polar region. This is because of the area being constantly covered with snow and with much lesser exposure to the sunlight. This makes the level of snow line near the sea level at the poles.

5 D. Question

Give reasons.

Wind can possibly erode the rocks from all the sides.

Answer

Erosion can also be caused by the actions of the wind that is blown in the earth's surface. It can result in the formation of geographical features though erosion, transportation and deposition. Wind can erode the rocks from nearly all the sides and create various types of geographical features.

Wind can easily erode rocks having a very soft base resulting in the formation of mushroom/pedestal rocks. In such situations, the wind erodes the soft layers of the base resulting in its erosion. The bottom layers are eroded resulting in the formation of a structure having a mushroom or pedestal-like structure in the top leaving its base like a stand to support the top. Inselberg is another important feature caused by the erosive action of the winds. These are formed by the action of wind in rocks like igneous rocks that are more resistant to the action of wind. Since these rocks have more resistance against the winds, they stand rising above the surroundings forming abrupt hills and cliffs. The feature yardang is basically formed in rocks having a vertical soft base. In such situations, the wind erodes the vertical soft layers of the base resulting in its erosion. These soft layers get eroded leaving crests and summits.

5 E. Question

Give reasons.

In the limestone region, surface drainage is rarely found.

Answer

In regions rich in limestone, the erosive actions of the underground water with the limestone may result in the development of karst regions. The underground water is the major reason for the formation of the karst topography. It is formed due to the dissolution of limestone, dolomite and gypsum with the groundwater. It is created because of the gradation, erosion and deposition of these soluble rocks with the groundwater. Thus the surface run-off is much lesser in the regions.

6 A. Question

Answer in a paragraph.

Write a note on weathering- classify and explain.

Answer

Weathering is the disintegration, breaking down and decomposition of components in the earth's crust through the action of natural or other agents. Weathering can occur due to exposure to the earth's atmosphere. Weathering

is controlled and determined by various factors like temperature, rainfall, vegetation and movements of other components in the earth's crust. The main types of weathering can be classified into three. They are:

• Physical weathering- It is the disintegration and breaking down of components in the earth's crust through the action of physical forces. It does not change the chemical composition of rocks. It occurs due to the changes in temperature during the day and the night in cold and dry places. Water, wing, pressure and other physical factors are the agents of disintegration. It can be again classified into different types. They are:

 Exfoliation- It is caused by the friction developing between the rocks when they are exposed alternately to heat and cold temperatures. The rocks disintegrate layer-by-layer with the constant changes in the heat resulting in the weathering of rocks. It can either happen through sheeting or shattering.

 Granular disintegration- It occurs when the changes in temperature and humidity react on crystalline rocks. This action causes the particles of the rocks to fall out from the surface due to the pressure exerted by the constant reaction with the changes in temperature and frost.

 Block disintegration- It is caused by the friction developing between the rocks when they are expanding and contracting during the day and the night. This causes strain and pressure in the joints and hinges of the resulting in their weathering and disintegration.

• Chemical weathering- It is the decomposition of components in the earth's crust through chemical reactions. It changes the chemical composition of rocks. Oxygen, carbon dioxide and hydrogen are the agents of decomposition. Chemical weathering is usually common in places with very hot and humid climates. It occurs in the climatic conditions of the hot and humid regions of the equators, tropics and sub-tropics. The action of the constant availability of water and the rising temperature is responsible for the faster weathering of rocks compared to other regions. The reaction between the atmospheric humidity and other elements are responsible for the higher rate of weathering. It can be further classified into different types. They are:

 Oxidation- This majorly occurs in ferrous rocks containing iron. The iron in these rocks reacts with the oxygen in the atmosphere resulting in the formation of iron oxide. This chemical reaction decomposes the rocks from within and results in its weathering.

 Carbonation- This mainly occurs in carbonate rocks. It is the reaction between the water molecules and the carbon dioxide in the atmosphere resulting in the formation of carbonic acids. The reaction of the carbonic acid with the carbonate rocks decomposes the rocks from within and results in its weathering. It basically occurs in the limestone region in the formation of caves.

 Solution- This is the reaction of water with the particles and substances found in the rocks. The action of water in rocks results in breaking down of its particles from within and results in its weathering.

 Hydration- This is the reaction some chemical compounds of the rocks with water. When these chemicals are exposed to water, they result in the swelling and enlarging of the minerals in the rocks. This decomposes the rocks from within and results in its weathering.

• Biological weathering- Biological weathering occurs because of the actions of the flora, fauna and human interferences. It results in the decomposition of the components due to the biological processes involved with the expansion of the activities of the living organisms. The growth of plants, the penetration of their roots, diffusion of rotten plant and animal cells, burrowing of animals and many other human interferences are the major causes of biological weathering.

6 B. Question

Answer in a paragraph.

Explain the erosional landforms formed by the underground water.

Answer

The underground water is the major reason for the formation of the karst topography. It is formed due to the dissolution of limestone, dolomite and gypsum with the groundwater. It is created because of the gradation, erosion and deposition of these soluble rocks with the groundwater. The Nullarbor in the Great Australian Coast is the world's largest karst area.

Most of the weathering and erosion occurs through chemical weathering. The solution is the main method of decomposition. Water reacts with the particles and substances found in the rocks, resulting in the breaking down of its particles from within. The reaction between the water molecules and the carbon dioxide in the atmosphere resulting in the formation of carbonic acids. The reaction of the carbonic acid with the carbonate rocks decomposes the rocks and results in its weathering. It basically occurs in the limestone region in the formation of caves.

Some of the erosional features of underground water are:

• Terra Rossa- This majorly occurs in ferrous rocks containing iron. The iron in these rocks reacts with the oxygen in the atmosphere resulting in the formation of iron oxide. This gives a red colour to the clay soil. When the limestone in the rocks dissolves in the water, it results in the deposition and accumulation of red clay in the surface resulting in the formation of clayey to filthy soil known as terra rossas. It is mostly found in the Mediterranean regions.

• Lappies- When the limestone in the rocks dissolves and decomposes in the water, it results in the formation of huge and big troughs and furrows. These channels of furrows are known as lappies.

• Sinkhole- When the limestone in the rocks dissolves and decomposes in the water, it results in the formation of huge and big funnels and shafts in the surface. They can be very deep with depth ranging up to nine meters.

• Caves and caverns- The reaction between the water molecules and the carbon dioxide in the atmosphere resulting in the formation of carbonic acids. When the carbonic acids react with limestone, huge hollows and caves called caves are formed. Caverns are also caves having irregular and asymmetrical floors.

6 C. Question

Answer in a paragraph.

What is a glacier? Explain its types.

Answer

Glaciers are huge masses of snow that is transported, accumulated and deposited in other regions due to the action of natural agents. Erosion and deposition are also caused by the actions of glaciers. It is also known as the river of ice. Glaciers can be divided into two types. They are:

• Continental glacier- It is formed in regions having a cold climate over years. It covers broad and vast areas. They are formed because of their longitudinal location. The pace of erosional and depositional activities are much lesser.

E.g. the Himalayas

• Valley glacier- It originates from snow-capped mountain ranges. It covers only narrow and small areas. They are formed due to altitudinal and longitudinal reasons. Erosional and depositional activities occur more rapidly resulting in the formation of a diverse environment.

E.g. Greenland

6 D. Question

Answer in a paragraph.

Describe the depositional works of wind.

Answer

Erosion and deposition are also caused by the actions of the wind that is blown in the earth's surface. It can result in the formation of geographical features though erosion, transportation and deposition. Many geographical features are created by the actions of wind. Some of the depositional works of the wind are:

• Loess- Loess refers to the deposition and accumulation of the fine silt and porous sand over the regions by the action of the blowing winds. It is largely found in the deserts and arid regions. The loess plateau in China has the densest deposit of loess in the world.

• Sand dunes- It is the deposition action of the wind. It is formed mainly from the sands carried during sandstorms in deserts. With the actions of wind huge amounts of sand gets carried and deposited in different places. These mounds

and piles of sand deposited in different places are called sand dunes. Dune 7 in Namibia is the world's largest sand dune.

• Barchan- It is the deposition action of the wind. It is formed mainly from the sands carried during sandstorms in deserts. They are the hemispherical and crescent-shaped dunes that have a gentle upward slope on the windward side and sharp vertical slope on the other leeward side. It is a common feature in the Sahara desert in Egypt.

• Transverse dunes- It is the deposition action of the wind. It is formed mainly from the sands carried during sandstorms in deserts. They are asymmetrical, lopsided and disjoint in nature. They are formed by the action of the subsequent blowing of fast and slow winds of the same direction. They are largely found in Medano Creek in the U.S.

• Longitudinal dunes- It is the deposition action of the wind. It is formed mainly from the sands carried during sandstorms in deserts. They are symmetrically formed dunes in the same direction as the wind blow. They are mostly even, regular and proportional. They are most common in Sahara desert.

6 E. Question

Answer in a paragraph.

Give a detailed account of the three orders of the landforms.

Answer

• First order landforms- They are the coarsest and the roughest level of landforms. It includes the continents and the ocean basins that comprise that largest area and volume in the earth's surface.

• Second order landforms- They are the intermediate and transitional landforms. They are associated with their tectonic structures by the changes in the endogenic forces. It includes the continental rises, slopes, ridges, canyons and trenches in the seabeds and continental masses, mountains, plains and plateaus in the in the surface lands.

• Third order landforms- They are the most detailed, thorough and the newest order of landforms. They are mostly created by the erosive and depositional activities on the earth's surface. They are associated with the exogenic forces. It includes islands, coastlands, beaches, coral reefs, sand dunes and caves.

7 A. Question

Consider the following statements and choose the right option given below:

i. 'I' shaped valley is an erosional feature of the river.

ii. 'U' shaped valley is an erosional feature of the glacier.

iii. 'V' shaped valley is an erosional feature of the glacier.

a. i, ii and iii are right

b. i and ii are right

c. i and iii are right

d. Only i is right

Answer

The river falls down from the steep mountain slopes and cliffs. Higher the steep of the mountain, higher will be the speed and pace of the fall and greater will be the force to broaden and extend the river valley resulting in erosion of many elements. V-shaped valleys, gorges, waterfalls, canyons and rapids are the major features associated with this course. Glaciers are huge masses of snow that is transported, accumulated and deposited in other regions due to the action of natural agents. Erosion and deposition are also caused by the actions of glaciers. It is also known as the river of ice. U-shaped valley is the valley that is formed by the erosive action of glaciers. It occurs when the glaciers move down a river valley.

7 B. Question

Consider the following statements and choose the right option given below:

Statement I. Running water is an important agent of gradation.

Statement II. The work of the river depends upon the slope of the land in which it flows.

a. Statement I is false and II is correct.

b. Statement I and II are false.

c. Statement I is true and II is false.

d. Statement I and II are true.

Answer

Gradation is the process of levelling up and formation of land surface by the operation of natural agents like air, water, glaciers or sea waves. Running water and rives are very important agents of gradation. The extent of the action of rivers depends upon many factors. The volume of water in the river, its velocity and speed, the gradient and slope of the land, the number of sediments and particles carried by the river are some of the factors determining the flow of the river.

7 C. Question

Consider the following statements and choose the right option given below:

Statement. Limestone regions have less underground water.

Reason. Water does not percolate through limestone.

a. The statement is right reason is wrong.

b. The statement is wrong reason is right.

c. The statement and reason are wrong.

d. The statement and reason are right.

Answer

The underground water is the major reason for the formation of the karst topography. It is formed due to the dissolution of limestone, dolomite and gypsum with the groundwater. It is created because of the gradation, erosion and deposition of these soluble rocks with the groundwater. Most of the weathering and erosion occurs through chemical weathering. The solution is the main method of decomposition. Water reacts with the particles and substances found in the rocks, resulting in the breaking down of its particles from within. The reaction between the water molecules and the carbon dioxide in the atmosphere resulting in the formation of carbonic acids. The reaction of the carbonic acid with the carbonate rocks decomposes the rocks and results in its weathering. It basically occurs in the limestone region in the formation of caves. Thus, limestone regions have less surface run-off and underground water because of these reactions.

8 A. Question

HOTS

Is wind the only gradient agent in the desert?

Answer

Yes, the wind is the most prominent gradient agent in the deserts. Erosion and deposition are also caused by the actions of wind. Many geographical features are created by the actions of wind. Besides winds, underground and running water can be considered as another agent. But it is rare for water to be an important agent. Since the land is highly arid and the presence of other agents like water, ice is very sporadic, wind can be considered as the only agent causing erosion and deposition in deserts.

8 B. Question

HOTS

Underground water is more common in limestone areas than surface water. Why?

Answer

In regions rich in limestone, the erosive actions of the underground water with the limestone may result in the development of karst regions. The underground water is the major reason for the formation of the karst topography. It is formed due to the dissolution of limestone, dolomite and gypsum with the groundwater. It is created because of the gradation, erosion

and deposition of these soluble rocks with the groundwater. Thus the surface run-off is much lesser in the regions.

8 C. Question

HOTS

The river channels in the lower course are wider than the upper course.

Answer

The river falls down from the steep mountain slopes and cliffs. Higher the steep of the mountain, higher will be the speed and pace of the fall and greater will be the force to broaden and extend the river valley resulting in erosion of many elements. V-shaped valleys, gorges, waterfalls, canyons and rapids are the major features associated with this course. In the middle course, the river passes through the sloping plains and valleys along with the particles and components like sand, slits, sediments, minerals and other elements. Actions of erosion and transportation take place in the middle course. The river widens and reduces in speed because of the particles that it carries. Alluvial fans, floodplains, meanders and ox-bow lakes are the major features associated with this course. The lower course marks the journey of river mainly in the plains loaded with sediments, minerals and huge amounts of debris. This debris is deposited and accumulated in the low-lying river beds resulting in the formation of very fertile soil. Here the main river will get split into a number of different river channels known as distributaries. This deposition and accumulation of components result in the formation of deltas and estuary. Thus, the silt, sediments and other particles carried by the river is responsible for its widening in the lower course.

9. Question

Map skill

On the given outline map of the world, mark the following.

i. Any two deltas

ii. A karst region

iii. Any two hot and cold deserts

iv. An area of continental glaciers

Answer

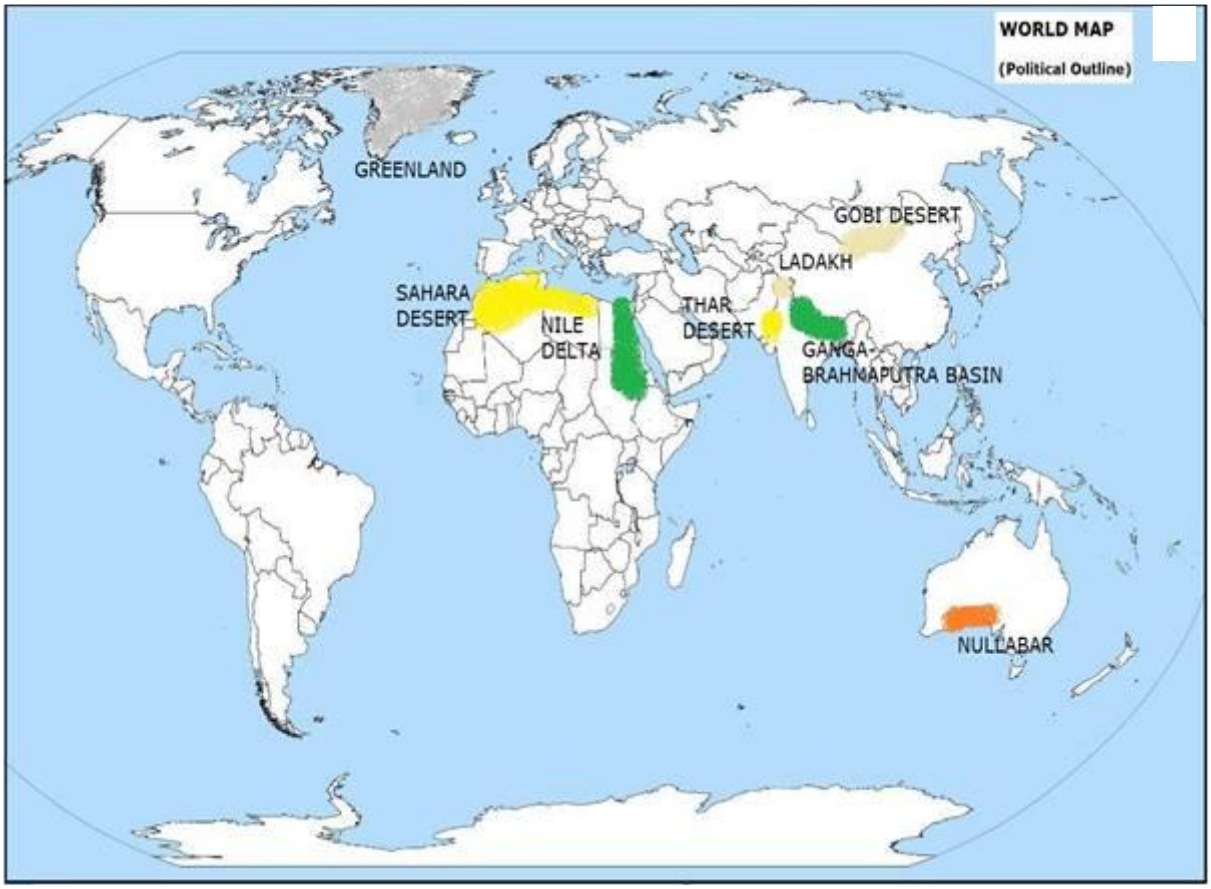
i. Ganga-Brahmaputra delta (Asia) and Delta of Nile (Egypt)

ii. Nullarbor in the Great Australian Coast

iii. Hot desert- Thar Desert (Asia) and Sahara desert (Africa)

Cold desert- Ladakh (Asia) and Gobi desert (Asia)

iv. Greenland (North America)



10 A. Question

Give geographical terms for the following:

Chemical alteration of carbonate rocks limestone region.

Answer

Carbonation

Explanation.

This mainly occurs in carbonate rocks. It is the reaction between the water molecules and the carbon dioxide in the atmosphere resulting in the formation of carbonic acids. The reaction of the carbonic acid with the carbonate rocks decomposes the rocks from within and results in its weathering. It basically occurs in the limestone region in the formation of caves.

10 B. Question

Give geographical terms for the following:

The flat surface near cliffs

Answer

Wave-cut platforms

Explanation

Erosion and deposition are also caused by the actions of ocean waves. It is an important agent for the creation of many geographical features. Wave-cut platforms are an important feature as a result of the erosion by sea waves. The flat and level surface formed at the base of the sea cliffs by the action of waves are wave cut platforms. They are also called beach, shoreline, ledge and coastline.

10 C. Question

Give geographical terms for the following:

Erosion + Transportation + Deposition

Answer

Gradation

Explanation

Gradation is the process of levelling up and formation of land surface by the operation of natural agents like air, water, glaciers or sea waves. The action of these agents results in the formation of various geographical features and structures with the passage of time. It is a highly time-consuming process and can result in the formation of sea cliffs, canyons, waterfalls and various other landforms. It occurs because of the combined action of erosion, transportation and deposition. It is the combined action of erosion, transportation and deposition.

10 D. Question

Give geographical terms for the following:

The bottom line of a snowfield.

Answer

Snowline

Explanation

Snowline is the line demarcating between the snow-covered and snow-free areas. It is the line up to which the level of snow extends given a particular point of time. It is the amount of permanent snow. The quantity of snowfall, steepness of the topography, exposure of the area to sun, winds, their speed and velocity are some of the factors that affect the snowline.

10 E. Question

Give geographical terms for the following:

Valley cut by glaciers.

Answer

U-shaped valley

Explanation

Glaciers are huge masses of snow that is transported, accumulated and deposited in other regions due to the action of natural agents. Erosion and deposition are also caused by the actions of glaciers. It is also known as the river of ice. U-shaped valley is the valley that is formed by the erosive action of glaciers. It occurs when the glaciers move down a river valley.