Exogenetic Movements Part 1

Exercise

Q. 1 A. Answer in brief

What is mechanical 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. Weathering can be mechanical, chemical or biological.

Mechanical or physical weathering 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, temperature, wind, pressure and other physical factors are the agents of disintegration. It can be again classified into different types- exfoliation, block disintegration and granular weathering.

Q. 1 B. Answer in brief

What are the main types of chemical 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. Weathering can be mechanical, 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. 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 and rusting the rocks from within. 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, minerals 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. This is mostly found in limestone rocks.

Q. 1 C. Answer in brief

How does biological weathering occur?

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 mechanical, 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, the spread of algae, moss, lichen and many other human interferences are the major causes of biological weathering.

Q. 1 D. Answer in brief

Distinguish between weathering and mass wasting.

Answer :

WEATHERING	MASS WASTING
• It is the disintegration, breaking down and decomposition of components in the earth's crust through the action of natural or other agents.	• It is the movement of rocks and other particles along slopes and hills because of the action of gravity and force and gets amassed in the bases.
• It can be mechanical, chemical or biological.	• It can be rapid movements like rock falls or landslides or slower movements like erosion.
• It does not result in the occurrence of any natural disaster.	• It can result in disasters like landslides.
• It does result in any movement.	• It results in the movement of debris and particles to distant places.

Q. 2 A. Write whether the statements are true or false. Correct the incorrect ones.

Climate affects earthquakes.

Answer :

False

Correction. Tectonic activities affect earthquakes.

Explanation

Earthquake is caused by the sudden vibration under the earth crust. The vibration spreads outward in all the direction as waves from the source of the disturbance. The point at which the earthquake starts is called focus which creates a series of waves. The epicentre is a point on earth surface which lies above the point of focus, the effect of the earthquake is mainly caused by the epicentre. An earthquake occurs due to release of energy along a fault. A fault is a sharp break in between the crustal rocks .rocks and fault to move in opposite direction. It occurs from the focus, where the vibration starts and extends up to the epicentre.

Answer :

False

Correction. Tectonic activities affect earthquakes.

Explanation

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Q. 2 B. Write whether the statements are true or false. Correct the incorrect ones.

Mechanical weathering is less effective in humid climates.

Answer : True

Explanation

Mechanical or physical weathering is the disintegration and breaking down of components in the earth’s crust through the action of physical forces. It occurs due to the changes in temperature during the day and the night in cold and dry places. But 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.

Q. 2 C. Write whether the statements are true or false. Correct the incorrect ones.

Mechanical weathering happens on a large scale in dry climates.

Answer : True

Explanation

Mechanical or physical weathering 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, temperature, wind, pressure and other physical factors are the agents of disintegration. It can be again classified into different types- exfoliation, block disintegration and granular weathering.

Q. 2 D. Write whether the statements are true or false. Correct the incorrect ones.

The breaking down of rocks into small parts is called weathering.

Answer : True

Explanation

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 mechanical, chemical or biological.

Q. 2 E. Write whether the statements are true or false. Correct the incorrect ones.

Lateritic rocks are formed through exfoliation.

Answer :

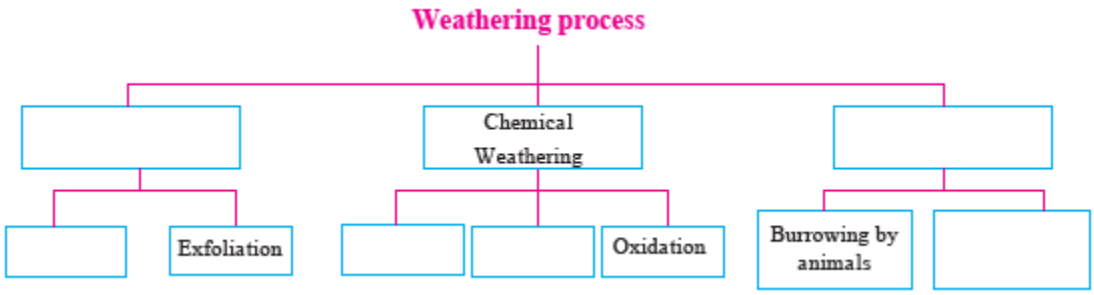
False

Correction. Lateritic rocks are formed through chemical weathering.

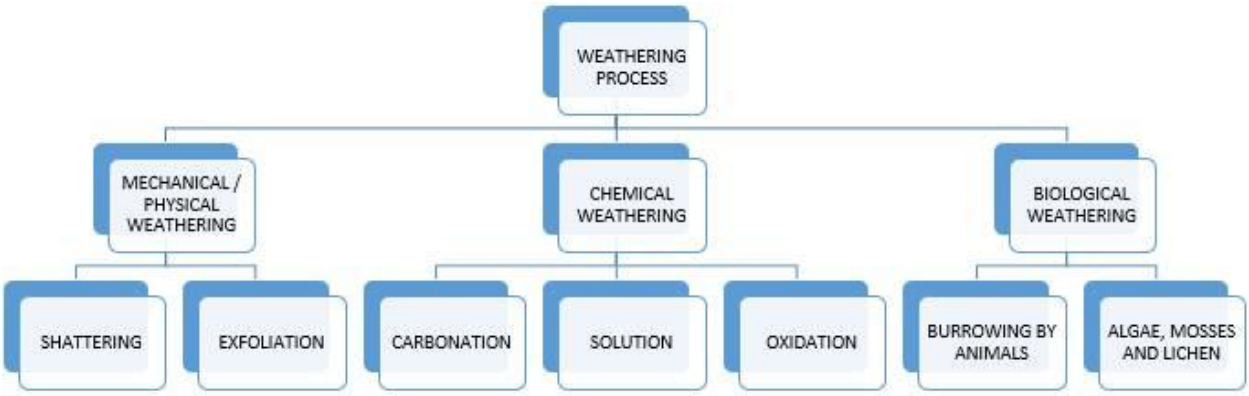
Explanation.

Lateritic rocks are largely composed of iron and aluminum. Oxidation 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 and rusting the rocks from within. This chemical reaction decomposes the rocks from within and results in its weathering.

Q. 3. Complete the following flowchart.



Answer :



Q. 4 A. Identify the type of weathering from the following description

Some animals live inside the ground by making burrows.

Answer : Biological weathering

Explanation

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, the spread of algae, moss, lichen and many other human interferences are the major causes of biological weathering.

Q. 4 B. Identify the type of weathering from the following description

The rock rusts.

Answer : Oxidation

Explanation

Oxidation 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 and rusting the rocks from within. This chemical reaction decomposes the rocks from within and results in its weathering.

Q. 4 C

Identify the type of weathering from the following description

Water which has accumulated in the crevices of rocks freezes. Consequently the rock breaks.

Answer : Action of frost

Explanation

Wn the water solidifies and becomes frost, its volume and dimensions increases. The particles of water expand. When the temperature falls below 0 ̊and becomes negative, the water that has accumulated in the crevices and joints of the rock freezes. This created pressure within the rocks resulting in its weathering.

Q. 4 D. Identify the type of weathering from the following description

The pipes supplying water in colder regions break.

Answer : Action of frost

Explanation

When the water solidifies and becomes frost, its volume and dimensions increases. The particles of water expand. When the temperature falls below 0 ̊and becomes negative, the water that has accumulated within the pipes freezes. This created pressure within the pipes will culminate in its breaking.

Q. 4 E. Identify the type of weathering from the following description

Sand formation occurs in deserts.

Answer : Action of temperature

Explanation.

With the increase in temperature, the minerals and components in the rocks expand and enlarges. With the fall in temperature, it contracts and reduces. This results in the accumulation of pressure between the cracks and joints in the rocks. They disintegrate with the increase in the pressure. This weathering results in the formation of sand.

Q. 5. Using the internet look for incidents of a few landslides that have occurred in India and write about them briefly.

Answer : A landslide is the gravitational movement of a mass of rock, or mass of earth or debris, downwards on a slope. It generally occurs when a hilly slope becomes unstable due to natural reasons such as groundwater pressure acting to destabilize the slope, volcanic eruptions, earthquakes, erosion, etc.

The major areas affected by landslides in India are:

• The Western Himalayas (in states of Uttar Pradesh, Uttaranchal, Himachal Pradesh and Jammu & Kashmir)

• The Eastern and North-eastern Himalayas (in states of West Bengal, Sikkim and Arunachal Pradesh)

• The Naga-Arakkan Mountain belt (in states of Nagaland, Manipur, Mizoram and Tripura)

• The Western Ghats region including Nilgiris (in states of Maharashtra, Goa, Karnataka, Kerala & Tamil Nadu)

• The Plateau margins of the Peninsular India and Meghalaya plateau in North-east India.

Some major landslides that causes havoc in the country are:

GUWAHATI LANDSLIDE, ASSAM

The landslide took place on September 18, 1948 due to heavy rains. Over 500 people died in the landslide and according to the reports, the landslide buried an entire village

DARJEELING LANDSLIDE, WEST BENGAL:

The landslide happened around October 4, 1968. The landslide was triggered by floods and the 60 km long highway was cut in 91 parts. As per reports, thousands of people died in the landslide

MALPA LANDSLIDE, UTTARAKHAND:

Consecutives landslides occurred between August 11 and August 17 in 1998 in the village of Malpa where over 380 people died as the entire village washed away in the landslide. The landslide is one of the worst landslides in India

MUMBAI LANDSLIDE, MAHARASHTRA:

The landslide was caused in July 2000. The landslide took place in the suburbs of Mumbai due heavy rains which was followed by land erosion. As per reports around 67 people died and the local trains were also stricken

AMBOORI LANDSLIDE, KERALA:

The landslide was known as the worst landslide in Kerala's history. The landslide occurred on November 9, 2001 due to heavy rains and around 40 people died in the incident

KEDARNATH LANDSLIDE, UTTARAKHAND:

The landslide took place on June 16, 2013 and was the result of Uttarakhand floods. Over 5700 were reported dead and over 4,200 villages had been affected by the floods and post-floods landslide.

MALIN LANDSLIDE, MAHARASHTRA:

On 30 July 2014, a landslide occurred in the village of Malin in the Ambegaon taluka of the Pune district in Maharashtra, India. The landslide, which hit early in the morning while residents were asleep, was believed to have been caused by a burst of heavy rainfall, and killed at least 151 people. The landslide was first noticed by a bus driver who drove by the area and saw that the village had been overrun with mud and earth. In addition to those dead, more than 160 people, and possibly up to 200, were believed to have been buried in the landslide in 44 separate houses. On 30 July 2014, a landslide occurred in the village of Malin in the Ambegaon taluka of the Pune district in Maharashtra, India. The landslide, which hit early in the morning while residents were asleep, was believed to have been caused by a burst of heavy rainfall, and killed at least 151 people. The landslide was first noticed by a bus driver who drove by the area and saw that the village had been overrun with mud and earth. In addition to those dead, more than 160 people, and possibly up to 200, were believed to have been buried in the landslide in 44 separate houses.