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SECTION : A
SUBJECT : Engineering Geology.

"D"

Answer the following questions?

QUESTION : (iii)

Why igneous rocks never contain fossils?

ANSWER :-

Fossils will not be present in igneous rocks as they are formed from molten materials thus destroying anything from that remains of the original material structure. We won't find any sort of metamorphic or sedimentary rock in an igneous rock due to the nature of these rocks. Fossils are predominantly found in sedimentary rocks. If the magma cools

slowly, large crystals form in the rock. They are intrusive ignous rocks because they form from magma underground. This is because any fossile in the original rock will have melted when the magma formed.

Some of igneous rocks are;

* Andesite.
* Basalt.
* Tuff.
* Scoria.
* Pumice.
* Rhyolite.

Question:- (iv) (a)

Granite takes much longer to cool deep underground than basalt lava at the Earth's surface. How and why is the size of the crystals in the granite different from baslt?

3.

⇒ **STATEMENT :-**

The size of the crystals in granite is different from the size of the crystals in basalt.

⇒ **REASON :-**

Igneous rocks are formed by the crystallisation of magma. The difference between granites and basalts is in silica content and their rates of cooling. A basalt is about 53% SiO_2, whereas granite is 73% Intrusive, slowly cooled inside the crust.

* Igneous rocks contain randomly arranged interlocking crystals. The size of the crystals depends upon how quickly the molten magma solidified:

→ Mgma thats cools slowly will form an igneous rock with large crystals.

→ lava that cools quickly will form igneous rock with small crystals.

4.

QUESTION :- (ii) (o)

A statue was made from limestone. Rain makes limestone weather more quickly than sandstone. What substance in the rain cause this?

⇒ STATEMENT :-

Rain makes limestone weather more quickly than sandstone.

⇒ REASON :-

Water dissolves more substances than any other known materials. Pure water ony stays pure until it touches something else. When the particulate is dust or pollen, the rain carries the particles to ground. This lowers the pH from 7 to about 5, depending on the concentration of carbonic acid.

limestone is a permeable rock because it has lines of weakness called joints and bedding planes. limestone is dissolved by carbon dioxide

as it passes through the atmosphere. The rain waters and carbon dioxide combine to form weak carbonic acid.

Sandstone is silica, Silica doesn't dissolve easily. Thats why limestone weather more quickly than sandstone.

QUESTION :- (i) (a)

In the table below are statements that refers to either Weathering .. .. .. ?

STATEMENTS	WEATHERING/EROSION
→ Breakdown of rock without it being moved.	"WEATHERING"
→ Wearing away of rocks during transport of rock particles	"EROSION"

→ A process caused by wind, running water and moving ice. "EROSION"

→ An effect of plant roots growing in rock joints & fraction "WEATHERING"

(v)

Describe one process that might be responsible for producing the large, angular and poorly sorted fragments in the Scree sediment collecting at the bottom of the cliff?

→ ANSWER:-

Scree sediments at the bottom of a cliff are large, angular and poorly sorted because of the process of Glacial Transport. Ice is the poorest sorter of sediment

7.

Glaciers can transport almost any size sediments easily, and when ice flow slows down or stops, the sediment is not deposited, due to the density of the ice. As a result, sediments deposited directly by ice when it melts are usually very poorly sorted.

P.T.O

8.

"A"

Figure 1, shows part of the Earth's crust and the location where some Rock cycle process take place.

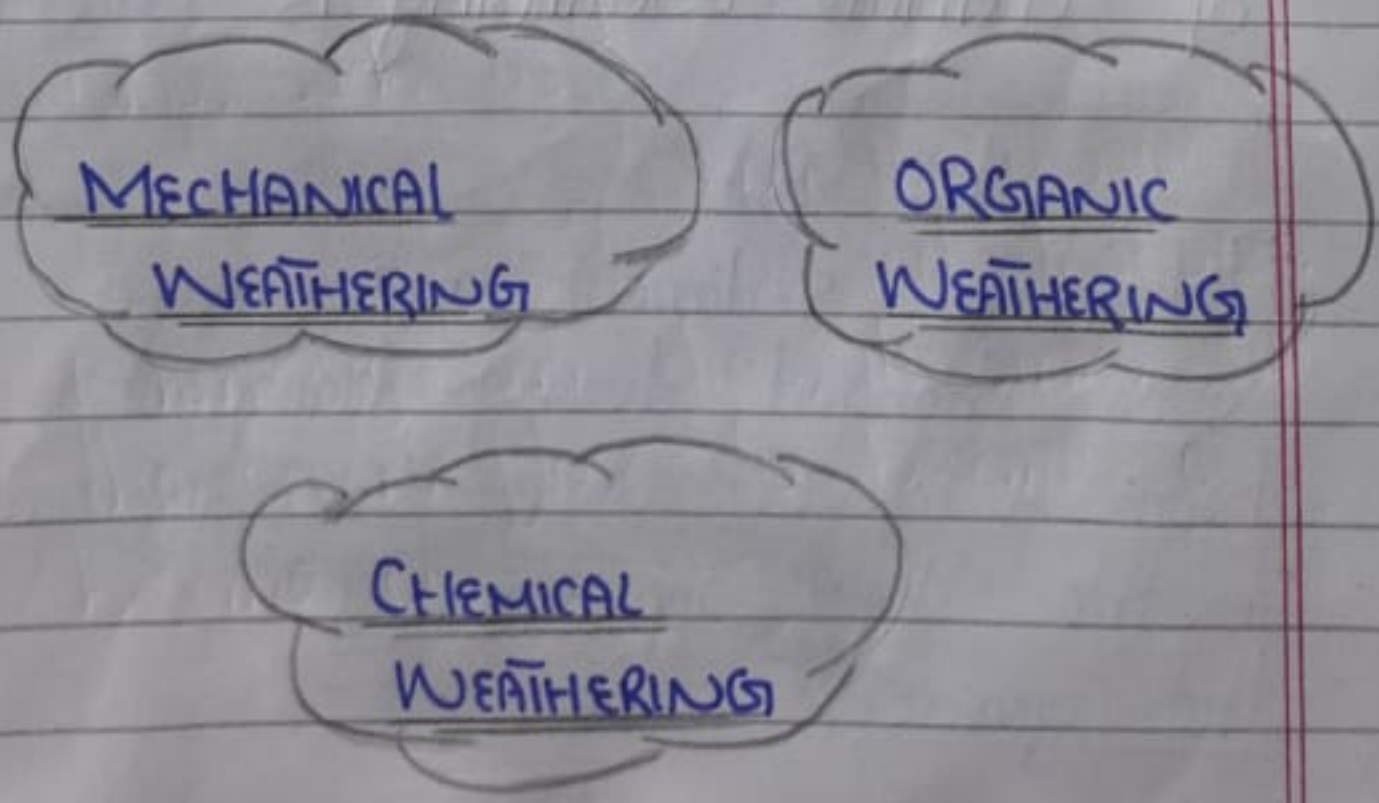
(a)

Rock is broken down by frost, rain and sun at 'A'. What name is given to this process?

⇒ ANSWER:-

"WEATHERING" is the process where rock is dissolved, worn or broken down into smaller and smaller pieces.

→ There are mechanical, chemical and organic weathering processes.



→ **ORGANIC WEATHERING :-**

Oxganic weathesing happens when plants break up xocks with theix growing xoots ox plant acids helps dissolve xock.

→ **MECHANICAL WEATHERING :-**

Mechanical weathesing phyically breaks up xock. One example is called fxost-action.

→ **CHEMICAL WEATHERING :-**

chemical weathesing decomposes ox decays xocks, and minexals. An example of chemical weathesing is 'watex'. →

A:- (B)

How is sediment gxain in a xivex changed duxing txanspoxt fxom A to B? Statē two difference in the likely appeaxance of the gxains?

1D.

ANSWER:-

The physical characteristics of sediments change during transport. Sediments are transported by four main agents water, ice, wind and gravity. The speed with which the agent of exosion moves affect the size of sediment particles that can be carried and the distance that the particles will move. and Roundness.

A:- (c)

How do loose sediments at 'c' become changed into solid rock?

→ ANSWER:-

Living creatures remove ions, such as calcium, magnesium and potassium from the water to make shells or soft tissue. When organism dies, it sinks to the ocean floor to become a become a biochemical sediments.

which may then become compacted and cemented solid rocks.

A:- (D)

Rocks are deeply buried in the Earth's crust may undergo metamorphism. Describe two changes that happen rocks during metamorphism and explain point 'D'?

⇒ ANSWER:-

The two changes that happen in rock during metamorphism are:-

→ Size and shape changes (structural)
→ Mineral changes.

* SIZE AND SHAPE CHANGES:-

Size and shape changes occure due to changing of temperature on rock, causing the rocks to break apart. In

respons to pressure, rock may deform or fracture. If stress is removed from rocks that have deformed, they may no return to their original shape and size.

* MINERAL CHANGES :-

During metamorphism mineral changes in rock the change occurs primarily due to heat, pressure and chemically active fluids. Different types of atoms and inorganic compound get involve in rock. By the change of chemical enviroment of the rock mineral are changed in the rock.

From Point 'D' metamorphism rock can change into igneous or sedimentary rock. When hot liquid magma is cooled their minerals can form crystal. At the surface metamorphic rock will be exposed to weathering process and may break down into ~~metamorphi~~ sedimentary rock. which would start the entire cycle.

/ "C"

Figure 3, shows the structure of a volcano and the rock layers beneath.

(i)

What type of volano is shown in the figure by shape and if exuption is more often, which catagory it fits?

→ ANSWER :- →

According to shape the type of volcano is "Composite volcano". A composite volano is formed thousand of years through multiple exuption. The exuptions build up the composite volano

layer upon layer until it towards thousands of meter tall. A composite valcano can also build up large quantities of thick magma.

(a)

Explain how gases trapped in the magma help produce the ash column.

→ ANSWER :-

Magma contains dissolved gases, which provide the driving force that causes most volanic eruption. As magma rises towards the surface and pressure decreases, gases are released from the liquid portion of the magma and continue to travel upward and are eventually released into the atmosphere. An eruption column consists of hot volcanic ash emitted during an explosive volcanic eruption. The ash forms a column rising many kilometers into the air above.

The eruption column may rise over 40km, penetrating the stratosphere.

(b)

(i) Suggest ONE sign that indicate if a volcano is about to erupt.

⇒ An increase in the frequency and intensity of felt earthquakes.

(ii) Suggest TWO dangers that might result from ash fall near a volcano.

* ⇒ Ash can threaten the helth of people and livestock, pose a hazard to flying jet air craft, damage electronics and machinery and interrupt power genestion and telecommunications.

* ⇒ Wind can carry ash thousand of miles, affecting for greater areas and many more people than other volcano hazards.

(B)

Figure 2, below the size and shape of typical sediment particles from the deposit.

(i)

ANGULAR BOULDERS

ROUNDED PEBBIES

CLAY MUD

(ii)

In your own words, explain how sediment particles change as they are transported downstream by a river.

→ ANSWER:-

Moving water also has the ability to move a piece of rock and soil. Water gets energy because it moving. Moving water has kinetic energy. When water stops moving it will have no energy to move any particle.

→ When a sediment in water collides with rock in and along the stream. Pieces of rock are chipped away and rough edges in rocks and sediments themselves become rounded. The bedrock beneath stream is also eroded by abrasion. Sediments flowing in the water can cut deeply into the bedrock. Some living thing (dead) also attached with it and take its shape permantly.