Paper : Engineering geology

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| Figure 1 | **Shows part of the earth’s crust and the location where some rock cycle processes take place.** |

**(a)**Rock is broken down by frost, rain and sun at A. what is 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, and organic weathering proceses.

**Organic weathering :**Organic weathering happens when plants break up rocks with their growing roots or plant acids helps dissolve rock .

**Mechanical weathering:** Mechanical weathering physically breaks up rock one example is called frostaction.

**Chemical weathering:** Chemical weathering decomposes or decays rocks, and minerals. An example of chemical weathering is water.

**(B) How is sediment grains in a river changed during transport from A to B? state two differences in the likely appearance of the grains.**

**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 erosion moves affect the size of sediment particles that can be carried and the distance that the particles will move and roundness.

**(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 biochemical sediments. Which may then become compacted and cemented ratio into solid rocks.

**(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 rock 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 primiraly due to heat, pressure and chemically active fluids.different types of atoms and inorganic compound get involve in rock. By the change of chemical environment 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 from crystal.at the surface metamorphic rock will be exposed to weathering process and may breakdown into sedimentary rock. Which would start the entire cycle.

**B. Figure 2, below shows the size and shape of typical sediment particles from the deposit produced.**

1. clay mud

2. Rounded pebbles and sand

3. Sloping sand layers

4. Angular boulders

(a) In each box, write down the most likely number from

The deposit produced column in the table above.

**ANSWER:**

Angular boulders

Rounded pebbles

Clay mud

**(B) In your own words, explain how sediment particles change as they are transported down stream 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.

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

**(1) What type of volcano is shown in the figure by shape and if eruption is more often, which category it fits?**

**ANSWER:**

The type of volcano is “composite volcano” a composite volcano is formed thousand of years through multiple eruption build up the composite volcano layers upon layers until it towards thousands of meter tall. A composite volcano can also build up large quantities of thick magma.

1. 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 volcanic eruption. As magma rises towards the surface and pressure decreases, gases are released from the liquid portion of the magma and contains 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 km into the air above. The eruption may rise above.

(1)Suggest one sign that indicate if a volcano is about to erupt.

Answer: An increase in the frequency and intensity of felt earthquakes.

**(2) Suggest two dangers that might result from ash fall near a volcano.**

**ANSWER:**

Ash can threaten the health of people and livestock, pose a hazard to flying jet air craft, demage electronics and machinery and interrupt power generation and telecommunication.

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

**D. ANSWER THE FOLLOWING QUESTION ?**

**(1) In the table below are statements that refer to either weathering or erosion. Complete the table by writing weathering or erosion in the spaces provided.**

**ANSWER:**

(1)Breakdown of rock without it being moved.

“**Weathering”**

(2)Weathering away of rocks during transport of rock particles.

**“Erosion”**

(3)A process caused by wind, running water and moving ice.

**“EROSION”**

**(**4)An effect of plant rods growing in rocks joints &fraction.

**“Weathering”**

**(2) A statue was made from limestone. Rain makes limestone weather more quickly than sandstone. What substance in the rainwater causes this?**

**ANSWER:**

**Statement:** Rain makes limestone weather more quickly than sand stone.

**Reason:** water dissolves more substance than any other known materials. 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 water and carbon dioxide combine to form weak carbonic acid sandstone is silica doesn’t dissolve easily. That’s why limestone weather more quickly than sandstone.

**(3) Why igneous rocks never contain fossils?**

**ANSWER:** Fossils will not be represent in igneous rocks as they are formed from molten materials thus destroying, anything that remains of the original material structure. We want find any sort metamorphic or sedimentary rock in an igneous rock. Fossils are predominantly found in sedimentary rocks. if the magma cods slowly, large crystals form in the rock. They are intrusive igneous 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**

**(4)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 granite different from the size of the crystals in basalt?**

**ANSWER:**

**STATEMENT** The size of the crystals in granite is from the size of the crystals in basalt.

**REASON** Igneous rocks are formed by the crystallization of magma. The difference between granites and basalt is in silica content and their rates of cooling. A basalt is about 53% sio2 whereas granite is 73% intrusive slowly cooled inside the crust.

* **I**gneous rocks contain randomly arranged interlocking crystals. The size of the crystal depends upon how quickly the molten magma solidified:
* Magma that’s cools slowly will form an igneous rock with large crystals.
* Lava that cools quickly will form igneous rock with small crystals.

**(5) Describe one process that might be responsible for producing the large, angular, 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 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.