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**Q1: A. Figure 1, shows part of the Earth’s crust and the locations where some Rock Cycle processes take place.**

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

**Answer**: Rocks are broken down by frost, rain and sun this process is known as Physical/Mechanical Weathering .

1. **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 sediment grains in a river during the transport from point **A** to **B** the two changes are likely to be seen in the appearance of the grains firstly the grain size of the sediment is reduced hence the sediment appears smaller in size and the second difference is that the shape of the sediment starts out to be angular which after transport can be seen to have changed into a more spherical structure hence the sediment is progressively rounded and sorted.

1. **How do loose sediments at C become changed into solid rock?**

**Answer**: At point C the minerals present at the lower surface of the ocean mix with the loose sediments, growing around them once large enough they fill up all the spaces around the sediments causing them to harden and form solid rocks.

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

**Answer**: During metamorphism rocks are subjected to high heat and pressure which results in formation of new rocks, two main types of changes occur depending upon the origin that is changes due to heat known as Contact metamorphism and changes due to pressure know as Regional Metamorphism. Point **D** is the point where two types of processes can take place one being formation to metamorphic rocks or Igneous rocks depending upon their conditions.

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

**(i) In each box, write down the most likely number from the Deposit produced column in the table above.**

**Answer**: According to the order of the shapes from left to right.

1. Angular boulders
2. Rounded pebbles and sand
3. Clay mud

**(ii) In your own words, explain how sediment particles change as they are transported downstream by a river**

**Answer:** As the sediment particles are transported downstream by a river we see the initially the grain size of the sediments are much larger and more angular the closer they are to the source and as they face motion due to the flow of the river downstream changes occur which are very apparent the size of the grain is reduced due to breaking off of sharp edges this phenomena also changes the overall shape of the sediment and forms a more spherical structure which is well sorted as water slows down the larger sediments are deposited to the nearest surface where they accumulate altogether .

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

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

**Answer**: The volcano shown in the figure by shape fits the category of Composite Volcano and due to eruption more often it is known as an active composite volcano.

**(II) The eruption shown in Figure 3 is producing an “Ash Column” that rises thousands of meters above the volcano summit.**

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

**Answer:** The gases trapped in magma help produce the ash column by initially expanding which causes the increase in pressure if this phenomena was absent a volcano would never erupt rather magma would ooze out of the volcano the gases confining magma are at a low pressure constantly the volume is increased by the formation of bubbles which causes the ash column as magma approaches the surface.

**(b) Many people around the World live close to volcanoes so, when a volcano erupts, thousands of lives may be at risk.**

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

**Answer**: One sign indicating that a volcano is about to erupt are an increase in earthquake’s in the area where the volcano is located.

**(ii) Suggest TWO dangers that might result from Ash Fall near a volcano.**

**Answer:** The two dangers that might result from Ash fall near a volcano are given below:

**1)** Due to the Ash being poisonous to humans it causes mass health problems majority of which may be respiratory problems.

**2)** Ash falls pose as hazard to construction or any objects in their surrounding and can cause destruction to them.

**(i) 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.**

|  |  |
| --- | --- |
| **Statement** | **Weathering OR Erosion** |
| **Breakdown of rock without it being moved** | Weathering |
| **Wearing away of rock 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 and fractures** | Weathering |

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

**Answer:** Rain makes limestone weather more quickly than sandstone because of the presence of **CO2** in rain water by addition from the environment .

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

**Answer:** Igneous rocks never contain fossils because while undergoing the high temperature all the fossils are melted while formation of magma hence leaving no possibility for fossils to be contained.

**(iv) 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:** The size of the crystals is dependent upon the rate at which the molten magma is solidified hence magma that cools slowly forms igneous rocks with large crystals whereas when magma cools rapidly it forms igneous rocks with large crystals.

**Reason:** The reason for small crystals is that when magma cools rapidly such as when basalt lava erupts from a volcano the resulting rock is fine grained with small crystals due to quick cooling on the contrary if magma is trapped within an igneous intrusion it has to cool gradually due to being surrounded by other rocks hence crystals have more time to grow and result in being larger.

**(v) 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:** One process that might be responsible for producing large, angular, poorly sorted fragments in the scree sediment collecting at the bottom of the cliff is **Free-thaw weathering** the spaces in between rocks can be filled easily by water which stays there and on freezing it expands due to which to which the spaces are filled on melting the water leaves the loose spaces which causes the rock to split gradually these sediments or fragments are they subjected to gravity which causes them to fall unevenly causing further splitting at times hence producing characteristics to be poorly sorted at the bottom of the cliff.