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Semester 2nd A
Paper geology.

A Figure 1: Shows part of the Earth's crust and the locations where some Rock Cycle processes take place.

a: Rock is broken down by frost, rain and Sun at A. What name is given to this process?

Ans: Sedimentary rock process (Physical weathering)

b: How are sediment grains in a river changed during transport from A to B? State two differences in the likely appearance of the grains.

Ans: Sediment grains in a river change during transport from A to B by transport process. The appearance of the grains are very angular and rounded shapes.

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

Ans: Loose sediment at C becomes changed into solid rock. This process is known as lithification.

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

Ans: There are two main types of metamorphism.

① Regional metamorphism:

Changes in enormous quantities of rock over a wide area caused by the extreme pressure from overlying rock ~~or~~ or from compression caused by geologic processes. Deep burial exposes the rocks to high temperature.

② Contact metamorphism:

Changes in a rock that is in contact with magma because of the magma's extreme heat.

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

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

Ans: 1st box = clay mud, Sloping sand layers, Angular boulders.

2nd box = rounded pebble and sand, Sloping sand layers.

3rd box = Angular boulder.

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

Ans: Sediment transport is the movement of organic and inorganic particles by water. The greater the flow, the more sediment that will be conveyed. Water flow can be strong enough to suspend particles in the water column as they move downstream. Sediment moves from one place to another the process of erosion. Erosion is the removal and transportation of rock or soil. Erosion can move sediment through water, ice or wind.

The four different river transport processes

- ① Solution
- ② Suspension
- ③ Saltation
- ④ Traction

1 : Solution :

minerals are dissolved in the water and carried along in solution

2 : Suspension :

fine light material is carried along in the water.

3 : Saltation :

Small pebbles and stones are bounced along the river bed.

4 : Traction :

large boulders and rocks are rolled along the river bed.

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?

Ans : Composite volcano.

II) The eruption shown in Figure 3 is producing an "Ash Column" that rises thousand of meters above the volcano summit.

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

Ans: The addition of water or carbon dioxide takes place deep in the earth where the temperature is already high, the lowering of melting temperature could cause the rock to partially melt to generate magma. one place where water could be introduced is at subduction zone. Here, water present in the pore space of the subducting sea floor water present in minerals like hornblende, biotite or clay minerals would be released by the rising temperature and then move in to the overlying mantle. clouds of gas and tephra that rise above a volcano produce an eruption column that can rise up to 45km into the atmosphere. Eventually the tephra in the eruption column will be picked up by the wind, carried for some distance and then fall back to the surface as a ash fall.

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.

Ans By Seismograph.

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

Ans i) Volcanic projectile.
ii) Volcanic ash.

D. Answer the following questions?

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.

Ans	Statement	Weathering or Erosion
1	Breakdown of rock without its being moved	Weathering
2	Wearing away of rock during transport of rock particles	Erosion
3	A process caused by wind, running water and moving ice.	Erosion
4	An effect of plant roots growing in rock joints and fractures	Weathering

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

Ans: Limestone are affected by chemical weathering when the rainwater which contains weak carbonic acids reacts with lime. The carbon dioxide (CO_2) from the respiration of animals and humans ~~being~~ dissolves in rain from atmosphere forming very dilute carbonic acid.

iii Why igneous rocks never contain fossils?

Ans: Igneous rocks are formed from molten rock that has cooled and solidified. The Earth is very hot inside, hot enough to melt rocks. The liquidified molten rock is known as magma. When the magma cools enough, it changes into solid state and igneous rock is formed. Therefore any fossils in the original rock melts when the rock is melted to form magma.

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 crystal in granite different from the size of the crystals in basalt?

Ans : Most of the ocean floor is basalt and most of the continents are granite. Basaltic crust is dark and thin and heavy, while granite is light and ~~it~~ accumulates into continent sized rafts which bob about like corks in this "Sea of basalt".

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

Ans : Scree is a product of rock fall. Frost weathering of cliff, together with other weathering processes, leads to the detachment of blocks. It is most obvious when temperature rise rapidly after a period of sub-zero temperature and the stones rattle down the corrie headwalls. The blocks fall bounce and slide until finally coming to rest at the base of the slope. The screen is highly unstable and comprises loosely fit angular blocks. The joy of scree running requires an even cover of relatively small fragments but many famous

Scree runs are now downright difficult because the many runners over the years have shifted the fine debris to the base of the slope, leaving only the larger ankle snapping blocks.