

Subject: Engineering Geology
Khan

Instructor: Engr. Imtiaz

Name: Asfandyar khan

Roll no: 7399

PART A: (figure 1)

Ans (a)= at point A the rock is broken down by frost, rain and sun. so as a whole this process is called **mechanical weathering/physical weathring** inn which rocks are broken down into smaller pieces by external conditions without a change in chemical composition , it is further divided into types for example here when the rock is broken down by frost so that process is called **frost wedging** which is freezing and thawing of water in cracks, another case here is the rock is broken down by sun which is called **exfoliation**

Ans(b)= from point A to B the sediments are carried by water In the river so now the changes in the sediments occur at chemical level, which is called **chemical weathering** which breaks rocks down chemically adding or removing chemical elements, and changes them into other materials. Chemical weathering consists of chemical reactions, most of which involve water.

Some processes that occur during this phase is solution, oxidation, reduction and hydration.so the differences in appearance of grains are of **shape and size** , nearer to the source the grain size is big and the shape is more angular as it moves farther from the source the grain size gets smaller and the shape gets rounder

Ans(c)= at point c the river deposits the sediments of rocks formed by weathering now at point c **formation of sedimentary rocks** occur by process of **lithification** in which the formed sediments are compacted under the pressure ,expel fluids and then form solid rock called sedimentary rocks.

Ans(d)= metamorphic rocks are formed due to high heat and high pressure on sedimentary rocks, there is two type of metamorphism, contact metamorphism and regional metamorphism, the first one uses magma for contacts and the 2nd one uses excessive heat and pressure

The two changes that occur in metamorphism are recrystallization and phase change, the first one changes the shape and size of grains and the 2nd one changes the arrangements of grains

Point D is the point where magma is formed due to melting of metamorphic rocks which will later start the igneous process to form igneous rocks

PART B: FIGURE 2

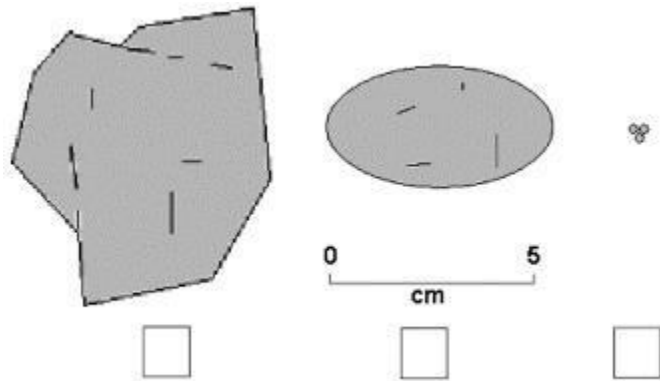
Ans (1) :

1. Clay mud
2. rounded pebbles and sand
3. Sloping sand layers
4. Angular boulders

First shape= angular boulders

2nd shape= rounded pebbles and
Sand

3rd shape= clay mud



Ans (2): as explained in part b of question 1 Some processes that occur during this phase is **solution, oxidation, reduction and hydration**.so the differences in appearance of grains are of **shape and size** , nearer to the source the grain size is big and the shape is more angular as it moves farther from the source the grain size gets smaller and the shape gets rounder

the sediments are carried by water In the river so now the changes in the sediments occur at chemical level, which is called **chemical weathering** which breaks rocks down chemically adding or removing chemical elements, and changes them into other materials

PART C: FIGURE 3

Ans (1): as the figure shows the shape is tall, steep and symmetrical and as told in the question that the ash column rises thousands of meters above so by shape the volcano is composite/AKA strato volcano.

Now as told in the question that the eruption is more often so it fits the category of active volcanoes which mostly occur at crustal plate boundaries

Ans(2)(a): the high viscous magma traps the gases ,the pressure is built in magma until blockage is blasted, when the gases are suddenly released with magma **it causes volcanic ash** which are **ejected to form ash column**, the ash is released with high speed of several hundred meters per second which are then lifted by conventional currents and so **ash column is formed**

Ans(2)(b)(i): a sign that might indicate if a volcano is about to erupt is noticeable steaming or enlarged areas of hot ground etc.

Ans(2)(b)(ii): the ash can have respiratory effects on human health which include nasal irritation throat irritation and it can also affect eyes. secondly the ash can affect the buildings as it can accumulate on roof increasing the load so the building may collapse killing human life

PART D:

Ans(i)

Statement	Weathering OR Erosion
Breakdown of rock without it being moved	Erosion
Wearing away of rock during transport of rock particles	weathering
A process caused by wind, running water and moving ice	Erosion
An effect of plant roots growing in rock joints and fractures	Weathering

Ans(ii): limestone is made of calcium carbonate and calcium magnesium carbonate and there is carbon dioxide dissolved in rainwater which makes rain acidic so now acid reacts with carbonate and weakens the limestone.

Ans(iii): igneous rocks are made **from molten rocks**, the metamorphic rocks are highly heated and pressurized and melted and then that melted rock form igneous rock so any **fossils would have melted**, that's why there are no fossils in igneous rocks.

Ans(iv): so there are two types of igneous rocks: **intrusive rocks and extrusive rocks**

Intrusive rocks are formed underground from magma deep in earth and extrusive rocks are formed from lava at surface of earth, **now granite falls into category of intrusive and basalt into extrusive**, so their size of crystal differ because

Intrusive rock cools slowly and their crystals are large like ant crystal bigger than 1mm is intrusive rock and extrusive rock has fast cooling and its crystals are small or no crystals

So, granite crystals are large and basalt crystals are small or no crystals

Ans(v): the frost weathering of the cliffs also together with the other processes of weathering, leads to the detachments of the blocks, when the temperature rises rapidly after subzero temperatures the stones come down the headwalls. The block slide and fall till the bottom forming the scree, the scree is highly unstable, loosely and poorly sorted fragments

The end