

- 1) Metamorphism does not mean melting but transfer from one type to another [1 Mark]. *and mineral logic*
- 2) The first phase in the metamorphism of shale is the rock Slate [1 Mark].
- 3) Degree of foliation in the metamorphic rocks depends on 2 factors; they are [2 Marks]:  
Type and amount of minerals present in the rock  
 & Temperature
- 4) Name 3 factors affecting the velocity of a running water (runoff) [3 Marks]:  
gradient (slope)  
discharge  
size, shape and roughness of channel
- 5) Sorting of stream sediments reflects change in the streams' velocity [1 Mark]. *(erosion ability) (porosity)*
- 6) The most important agent of Earth's wearing is run-off [1 Mark].
- 7) Flaky (platy) minerals like mica, when subjected to high pressure, they orient themselves in a direction perpendicular to the direction of the exerted stress. [1 Mark].
- 8) Define the followings [5 Marks]:
- A- Potholes. holes that are formed in channel due to pebble sediments in water that make holes in the channel [1]
  - B. Saltation. type of movement of <sup>large</sup> sediments  $\updownarrow$  at the bottom (bed load), it is upward and downward movement, it needs floods because particles are large [1]
  - C. ppm. parts of dissolved materials per million parts of water (parts per million) [1]
  - D- Karst phenomenon. reflect of water erosion, it exhibits an irregular terrain, punctuated with many depressions called sink holes and they range from 1-50 m and <sup>Back surface drainage</sup> [1]
  - E- Cone of depression. The shape that well makes, when it bores a hole that is pumped with ground water [1]
- 9) As a Civil Engineer what do you recommend to do to prevent the sea salt water polluting the wells dug near the shore in the fresh water aquifers? [2 Marks]:  
purification of the water and oxidation of the bacteria polluting,  
(not using well for long time, polluted water is taken and treated, stop source of pollution)  
*Caused by gradual dissolving and sudden collapsing*
- 10) We name a dug groundwater well an artesian well if : [2 Marks]:  
Water is confined so that aquifer is inclined so one end is exposed to receive water  
& Impermeable layer (aquiclude) both above and below aquifer [2]
- 11) The part of an aquifer that lies below the water table is called [1 Mark]:  
Saturation zone Saturation Zone