6. Rocks and Rock Cycle

EXERCISE

A. Answer the following questions :

1. Describe how Sedimentary Rocks and Igneous Rocks are formed. Give two examples of each.

Ans.

- **Sedimentary rocks :** They are formed from material derived from pre-existing rocks and from organic sources by the process of denudation, the material obtained by denudation are deposited in layers. e.g., sandstone, limestone, etc.
- **Igneous rocks :** They are formed by the solidification of hot molten lava called magma which consists of liquid, gas and crystals, e.g., batholith, laccolith, etc.

2. On the basis of occurrence, classify Igneous Rocks.

Ans. Classification of Igneous rocks on the basis of occurrence are:

- **Intrusive :** Magma that solidifies below the Earth's surface and remains surrounded by pre-existing rock .E.g. Plutonic
- **Extrusive:** Rocks formed by solidification of magma above the Earth's surface. E.g. basalt, gabbro, etc.

3. Name the three rock forming minerals.

Ans. Quartz, feldspar, mica are the three most common rock forming minerals.

4. What are Batholiths?

Ans. Batholith is a large mass of igneous rocks (mostly granite) covering about 100 sq. km area. Its floor is not visible.

5. What is Metamorphism? What are its causes?

Ans. Metamorphism is an alteration of the minerals and textures of a rock by changes in temperature and pressure and by a gain or loss of chemical composition. The causes are:

- volcanic eruptions,
- the mountain building movements, and
- endogenetic forces • on contact with undergoing water.

6. What are Fossils? What is their significance?

Ans. • The sedimentary rocks consists of the remains or the forms of the sea plants and animals which have been buried and preserved in these rocks for a long time. This type of rocks are called fossils.

- Fossils help in determining the age of the given rock.

7. Name a few important characteristics of sedimentary rocks.

Ans. The characteristics of sedimentary rocks are:

- The sedimentary rocks contain layers or strata. They are therefore often known as stratified rocks.
- Most of them are permeable and porous.
- They contain fossils.

8. Name the various types of metamorphic rocks.

Ans. The various types of metamorphic rocks are:
Thermal metamorphism: Graphite
Dynamic metamorphism
Regional metamorphism
Contact metamorphism: Marble

9. Name the agents involved in the formation of sedimentary rocks.

Ans. The agents involved in the formation of sedimentary rocks are sea, lakes, streams or glaciers and wind.

10. Give examples of metamorphic rocks formed from igneous and sedimentary rocks.

Ans. The metamorphic rocks formed from igneous and sedimentary rocks are slate, schist, quartzite, marble and gneiss.

11. What are sills and dykes?

Ans. **Sill:**

- It is a sheet like body of igneous rock.
- It is formed when magma forces its way between two layers of sedimentary rocks and cools and solidifies there.
- Sills are formed from highly fluid basaltic magma.

Dyke:

- It is a sheet like body of intrusive igneous rock.

12. Why are sedimentary rocks also called stratified rocks?

Ans. Sedimentary rocks are also called stratified rocks because they are deposited in layers by sea, glaciers, wind or weathering agents.

These layers are called strata and hence stratified rocks.

13. What processes are involved in the formation of igneous rocks?

Ans. The processes involved in the formation of igneous rocks are:

- Igneous rocks are formed through the cooling and solidification of magma (or lava).
- As hot, molten rock rises to the surface, it undergoes changes in temperature and pressure that cause it to cool, solidify, and crystallize.
- Intrusive igneous rocks are formed by the solidification of magma below the Earth's surface.
- Extrusive igneous rocks are formed by the solidification of magma above the Earth's surface.

14. What is a rock cycle?

Ans. Rock cycle is a model representing the interrelationship among the three rock-forming processes: igneous, sedimentary and metamorphic rocks.

15. What are the rocks?

Ans. Rocks are an assemblage of minerals bound together (like granite), or may be a mass of, minerals like rock salt.

16. Classify rocks on the basis of their origin.

Ans. Classification of rocks on the basis of their origin:

- Igneous rocks are classified on the basis of texture of grains and composition and mode of origin.
- On the basis of silica present, they are classified as acidic and basic igneous rocks.
- On the basis of occurrence, they are classified as intrusive and extrusive rocks.

17. What is meant by intrusive rocks?

Ans. Intrusive igneous rocks are formed by the solidification of magma below the Earth's surface. E.g., plutonic.

18. What are extrusive rocks?

Ans. Rocks formed by solidification of magma above the Earth's surface, E.g., basalt, gabbro, etc.

19. Why does sial float over the sima?

Ans. Sial floats over sima because the density of sial is less than sima.

20. How important are rocks for industrial development?

Ans. Importance of rocks:

- They contain minerals which directly or indirectly help in manufacturing industries. For example, Metallic minerals like gold, zinc, copper etc.
- They are widely used as building materials. For example, marble, granite, etc.
- They also supply a wide variety of minerals which become the main raw material in manufacturing industries. E.g., limestone, gypsum, etc.

B. Define the following terms :

1. Minerals

Ans. A mineral has a definite chemical composition with its own chemical and physical properties, e.g., silicates and quartz.

2. Rocks

Ans. **Rocks:** They are an assemblage of minerals bound together (like granite), or may be a mass of minerals like rock salt.

3. Sills

Ans. It is a sheet like body of igneous rock. It is formed when magma forces its way between two layers of sedimentary rocks and cools and solidifies there.

Sills are formed from highly fluid basaltic magma.

4. Dykes

Ans. It is a sheet like body of intrusive igneous rock.

5. Conglomerate.

Ans. Conglomerate: It is a type sedimentary rock which consists of sandstone consisting of pebbles of hard rock.

C. Distinguish between the following pairs :

1. Rocks and Minerals.

Ans.

Rocks	Minerals
They are an aggregate of minerals bound together (like granite), that form a more or less definite unit of Earth's crust.	A mineral has a definite chemical composition with its own chemical and physical properties.
E.g., igneous, sedimentary and metamorphic	E.g., silicates and quartz

2. Volcanic rocks and plutonic rocks.

Volcanic Rocks	Plutonic Rocks
These are formed by the solidification of lava above the Earth's surface.	Igneous rocks of deep seated origin
These are fine grained.	These are coarse grained
E.g., Obsidian, etc.	E.g., gabbrro, granite, etc.

3. Acidic igneous rocks and basic igneous rocks.

Acidic Igneous Rocks	Basic Igneous Rocks
They have more silica.	They have lower quantities of silica.
E.g., granite	e.g., gabbro

4. Thermal and Dynamic Metamorphism.

Thermal	Dynamic
It is formed when the change take place due to high temperature.	It is formed when the change take place due to high pressure.

D. Give reasons for the following :

1. Igneous rocks are also called primary rocks.

Ans. Igneous rocks are called primary rocks because:

- They are formed from the solidification of molten magma.
- Igneous rocks begin the rock cycle, and are therefore called primary rocks.
- They represent the rocks which directly or indirectly provided materials for the formation of other types of rocks.

2. Extrusive igneous rocks have generally small crystals.

Ans. Extrusive igneous rocks have generally small crystals because:

- Extrusive igneous rocks come from lava.
- Lava, at the surface, is exposed to air and water which causes the molten rock to cool rapidly.

3. Rocks are of great economic significance.

Ans. Rocks are of great economic significance:

- They contain minerals which directly or indirectly help in manufacturing industries. For e.g., Metallic minerals like gold, zinc, copper, etc.
- They are widely used as building materials. For example, marble, granite, etc.
- They also supply a wide variety of minerals which become the main raw material in manufacturing industries. E.g., Limestone, gypsum, etc.

E. Diagram :

1. Draw a diagram of a volcano.
2. Draw a neat diagram to show the rock cycle.

Ans. Students to do it themselves.

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