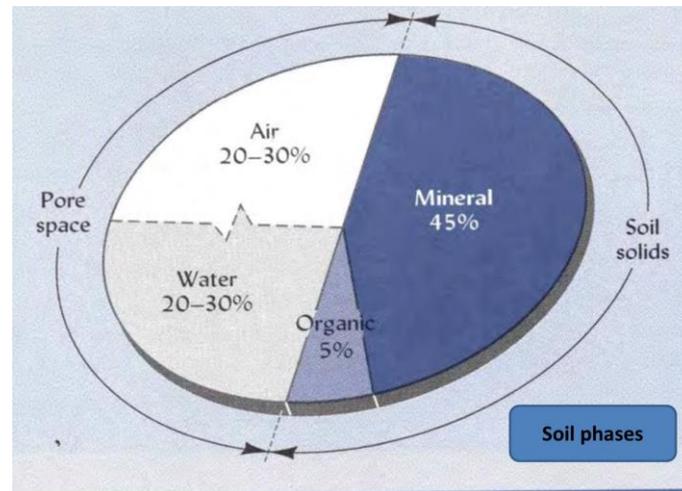


TD N° 2 : The Constituent Elements of Soil

Q1: Complete the following :



Q2: complete the table:

Quartz (SiO ₂)	Muscovite (a type of Mica)	Feldspars
<ul style="list-style-type: none"> ○ chemically stable mineral ○ resists weathering ○ contributes to soil texture 	<ul style="list-style-type: none"> ○ A silicate mineral ○ sheet-like structure ○ releasing potassium during weathering 	<ul style="list-style-type: none"> ○ A group of aluminosilicate minerals ○ weather to form clay minerals ○ releasing nutrients : K,Ca,Na

Q3: Explain briefly the difference between primary and secondary minerals.

Primary minerals are those that have not undergone significant chemical changes since their formation. They originate directly from the parent rock, while Secondary minerals are formed through the chemical alteration of primary minerals

Q4: What are the key processes of soil chemical weathering?

Hydrolysis: Reaction with water, altering mineral structures.

Oxidation: Reaction with oxygen, especially affecting iron-containing minerals.

Dissolution: Minerals dissolve in water, often aided by acids.

Carbonation: Reaction with carbonic acid formed from CO₂ and water.

Q5: soil CEC contributes to:

- Increase soil fertility
- Loss of soil mineral
- Source of mineral elements
- Regulate soil pH

Q6: what are the most important group of secondary minerals ?

The most important group is clay minerals, such as: Kaolinite: Montmorillonite: Illite:

Q7: Factors Affecting Mineral Composition

- Parent Material
- Soil pH
- Climate
- Soil structure

Q8: What are the sources of soil organic matter?

Plant Residues:

Animal Residues:

Microbial Activity:

Q9: Role of Organic Matter in Soil

- Decrease soil CEC
- Water retention
- Promotes the formation of soil aggregates
- Nutrient cycling and stop biological activities

Q10: How is soil humus formed?

Soil Humus is the dark, organic component of soil formed from the decomposition of plant and animal matter by microorganisms.

Q11: Define colloidal Complexes in Soil

Colloidal complexes are finely divided particles in soil that play a crucial role in determining its physical, chemical, and biological properties. They include both inorganic (clay minerals) and organic (humus) colloids.

Q12: true or false:

- **Inorganic Colloids** is mainly humus, which is formed from the decomposition of organic matter. **False**
- **Inorganic Colloids** are derived from the weathering of rocks and minerals. **True**

Q13: Complete the table

High Surface Area	Charge Characteristics	Swelling and Shrinking
large surface area relative to their size	Colloids carry negative charges	swell when wet and shrink when dry,
Adsorb water, nutrients, and other ions.	attract and hold positively charged	Affect soil structure and porosity.

