

**Q1/** Define the soil degradation, then count the indicators of soil quality?

**Q2/** Write the importance of clay mineral, then draw the structure of 2:1 clay minerals?

**Q3/** What is CEC, then explain its relationship with soil pH by figure?

**Q4/** Why soil color is important? Establish a table involving soil color, soil attributes and environmental conditions?

**Q5/** Define soil profile and explain by illustration the main horizons in typical profiles?

**Q6/** In general, the N cycle processes included of fixation, mineralization, nitrification, Denitrification, volatilization, immobilization. Explain each process by equation?

**Q7/** Unsaturated hydraulic conductivity is always lower than saturated hydraulic conductivity.

**Q8/** The amounts and kinds of cations adsorbed are the result of the interaction of the concentration of cations in solution and the energy of adsorption of the cations for the exchange surface.

**Q9/** The  $\text{H}_2\text{PO}_4^-$  or  $\text{HPO}_4^{2-}$  are two forms of P known as orthophosphates available for organisms at pH 7.3.

**Q10/** The amount of water actually available to the plant is the amount of water stored in the soil at field capacity minus the water that will remain in the soil at permanent wilting point.

**Q11/** Soil develops as a result of interplay of 5 factors: parent materials, climate, organisms, relief and time. The climate is probably the most important factor.

**Q12/** What are the main functions of soil?

**Q13/** Define soil structure and explain its importance?

**Q14/** Define soil texture, then explain the differences between fine and coarse soil texture in a table?

**Q15/** Explain the soil formation processes?

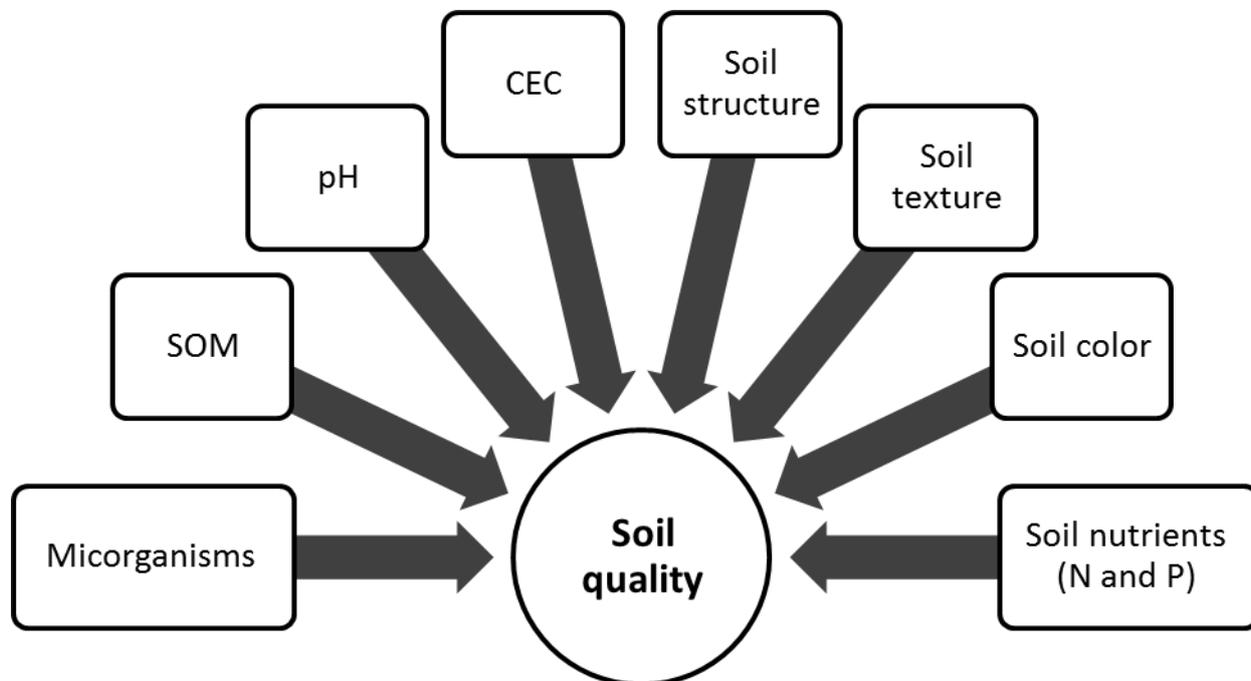
**Q16/** What is soil buffer capacity, then explain the sources of alkalinity and acidity in soil?

**Q17/** What are the main differences between Rhizosphere and Rhizoplane and describe how soil texture and soil pH affect both?

**Q18/** Define soil profile and explain by illustration the main horizons in typical profile ?

**Q19/** In general, the N cycle processes included of fixation, mineralization, nitrification, denitrification, volatilization, immobilization. Explain each process by equation?

**Q20/** Describe the relationship between the following, then give the reasons?



**Q21/** Count the plant derived compounds?

**Q22/** Explain the factors that affect the cation adsorption?

**Q23/** Write the important of fungi in soil ?

**Q24/** Why lignin is resistant component of soil organic material?

**Q25/** Describe by the examples the ability of Bacteria to decompose a wide range of materials under a variety of conditions?

**Q26/** How the sandy soil texture effect the rhizosphere extend

**Q27/** Write the difference between the following ?

1-Rhizosphere and Rhizoplane 2-Cation exchange and Anion exchange 3-Decomposition and Humification 4-Chitin and cellulose 5- Photoheterotrophs and Chemoheterotrophs

**Q28/** Used the Direct, Inverse and No terms to answer the relationship amongs the following?

Micelle colloids, Water content, Organic matter, Anion exchange, Earthworms.

**Q29/** Most soils have pH values between

- A. 4.5-8.5      B. 4-8.5      C. 6.8-8.5      D. 7.0-8.0

**Q30/**The transformation of organic matter to humus is .....

- A. humification      B. decomposition      C. amination      D. degradation

**Q31/**The microclimate of the soil is defined in terms of its internal .....regimes and is therefore generally determined by the external climate.?

- A. temperature      B. temperature and hydrological      C. hydrological      D. none

**Q32/**Qualitatively the .....is the ability of soil to transmit water?

- A. all      B. conductivity      C. thermal conductivity      D. water conductivity

**Q33/** The DOM refer to .....?

- A. decay organic matter      B. dissolved organic matter      C. dry organic matter      D. None

**Q34/**Why lignin is particularly resistant component of soil organic matter ?

**Q35/** Count the sources of acidity and alkalinity ?

**Q36/**Discuss the role of humus in soil water content and detoxification ?

**Q37/**This equation  $K = \frac{QL}{Ah}$  represented water conductivity prove it?

**Q38/**Explain the relation between Albedo and each of (Organic matter and Snow) ?

**Q39/**Subsoil color reflects more strongly in most soils the imprint of physico-chemical processes. In well aerated soils  $Fe^{3+}$  is present as ----- which give soil a ----- color. In more poorly drained soils iron compounds are present as----- which give the ----- color .

**Q40/**Soil climate has two major components the ----- and temperature, influencing evaporation. Temperature determines the rate of reactions -----and -----decay and so has an influence on ----- and -----.

**Q41/**The horizons may be further subdivided. For example, the A horizon has been divided into 4 further pedological horizons: (L) ----- (F) ----- (H) ----- (E) -----, moreover due to the activity of microorganisms the A horizon is termed -----?

**Q42/**The parent material can influence the soil in a number of ways: -----, -----, -----, -----, -----.

**Q43/**A black color in the subsoil can be related to an accumulation of -----, while the black color of surface horizon related to accumulation of -----.

**Q44/**The -----involves continual breakdown rocks into smaller and smaller particle, while ----- involves alteration of the composition of rock minerals.

**Q45/**The movement of material in soil solution from one horizon to another is referred to as ----- . The upper mineral horizon losing the material is the -----horizon. The lower horizon gaining the material is the ----- horizon

**Q46/**----- is the breakdown of plant remains leading to the formation of different types of -----  
 ----- . It is probably the most important biological process taking place in soils. ----- develops under  
 deciduous woodland, where base-rich plant remains are actively broke down by a prolific soil biota.

**Q47/**----- water content is define as the difference of water content at -----and water  
 content at -----?

**Q48/**-----is a perennially frozen soil horizon.

**Q49/**The microclimate of the soil is defined in terms of its internal ----- and -----and is  
 therefore generally determined by the external climate.

**Q50/**Soils develop as a result of the interplay of 5 factors; -----, -----, -----  
 --, ----- and -----?

**Q51/**The distinct layers of soil profile horizons?

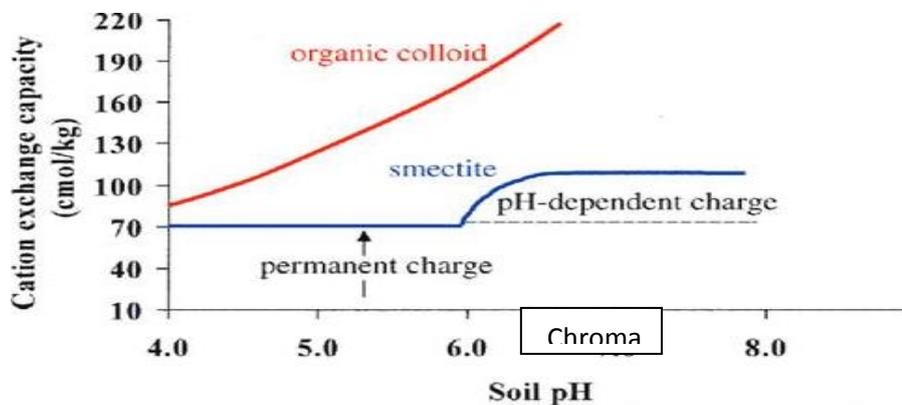
**Q52/** Page in a Munsell color book?

**Q53/**Soil formation process?

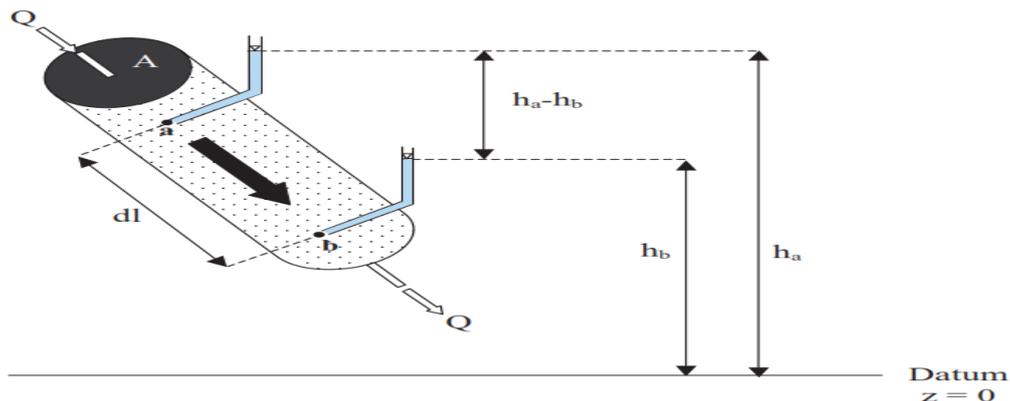
**Q54/** Define the albedo, then explain the factors affect the albedo?

**Write what do you know about the following?**

**Q55**



**Q56**



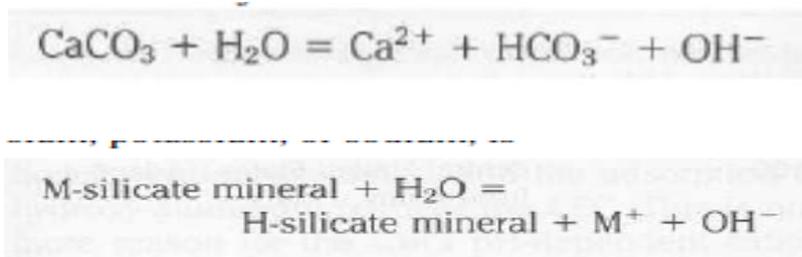
Q57



Q58

$R_n = [S(1-a)] + L_n$   
where S=incoming short-wave radiation, a=fractional albedo of the surface and  
L<sub>n</sub>=net outgoing long-wave radiation.

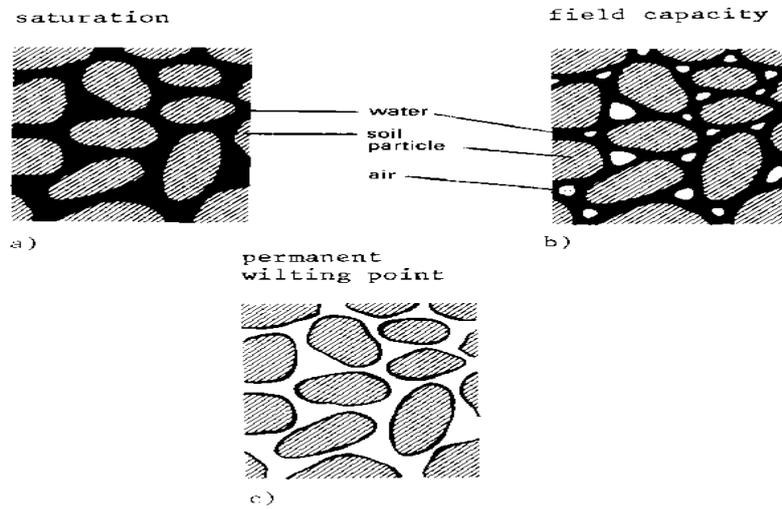
Q59



Q60

$$n = \frac{V_v}{V_T} = \frac{V_v}{V_w + V_s + V_a}$$

Q61



**Q62/Explain the soil formation factors ?**

**Q63/Count the important of soil texture, then write the differences between fine and coarse soil texture ?**

**Q64/Define the Albedo, then explain the soil factors that effect it ?**

**Q65/Define soil profile and explain by illustration the main horizons in typical profile ?**

**Q66/ Define the SOM then count the sources of DOM?**

**Q67/Explain the major chemical reaction and processes in soil by illustration ?**

**Q68/Chose the correct one from the following senses?(20marks)**

1- The zone immediately adjacent to plant roots in which the kinds, number, or activities of microorganisms differ from that of the bulk soil is termed

**a-Lithosphere ,b-Rhizosphere , c- Pedosphere**

2-Dokuchaev considers the soil as a natural body

**a- having its own genesis ,b- having its own history of development , c- both**

3- The influence of soil on organisms, especially plants is called

**a-Pedology ,b-Edaphology , c- Pedosphere**

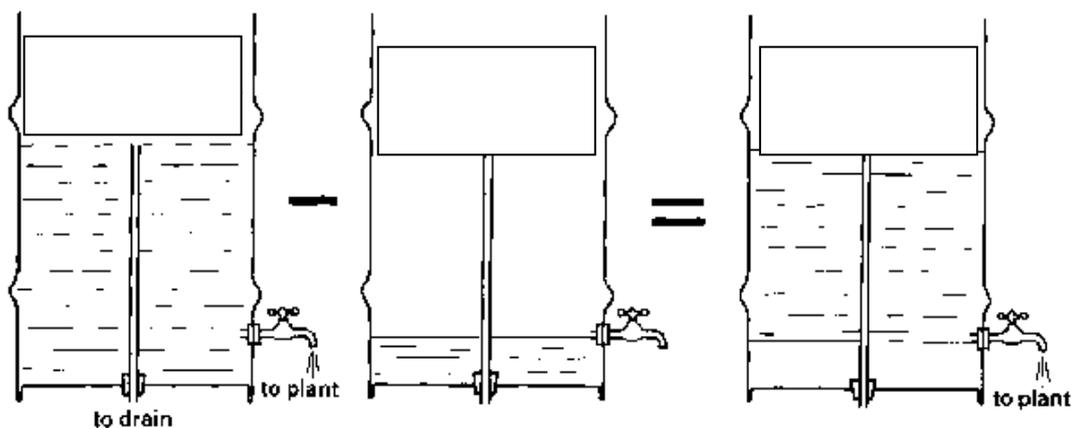
4- The structure of the soil surface is important for

**a-Aeration and water permeability and it is relation to runoff, b-The degree of resistance to erosion and formation of good seedbed to initiate plant growth, c-All**

5- The average particle density for mineral soils is usually given as

**a- 2.65 g.cm<sup>-3</sup> , b-2.65 Kg.m<sup>-2</sup>, c- none**

**Q69/The soil water content classified depending on physical and biological properties to different shape count them, then complete this illustration. (20 marks)**



**Q70/Define the rhizosphere and rhizoplane, then explain general impacts on rhizosphere microorganisms of plants? (20 marks)**

**Q71/What is the alkaline soil, then discuss the effect of physico-chemical processes?(20 marks)**

**Q72/Define the soil texture, then explain the significance of soil texture? (20 marks)**

**Q73/ The Munsell notation distinguishes three characteristics of the color: hue, value, and chroma, define them and complete the illustration below, then discuss in briefly the factors influenced soil color.**

**Q74/Fill the following blanks?(25marks)**

- 1-The influence of soil on organisms, especially plants is called.....?
- 2-Dokuchaev considers the soil as a natural body having its own .....and.....?
- 3- Soil is a complex and intimate mixture of materials distributed among the....., ..... and.....?
- 4-Buffering in soil is defined as.....and is chiefly due to the ..... and.....?
- 5- Texture is the relative proportions of....., .....and.....?
- 6- A critical determinant of soil structure is.....?
- 7-avalable water content is equal to the water content at ..... minus water content at.....?
- 8- In general up to five layers can be present in a typical soil profile ....., ....., ....., .....and ..... horizons?
- 9-If the soil in a 410 cm<sup>3</sup> core weighed 600g at oven dry, and 800g at water satiation, the satiated soil would contain 200 g of water that occupies 200 cubic centimeters of space (1 g of water has a volume of 1 cm<sup>3</sup> ). Porosity is equal to.....?
- 10- Most soils have pH values between 4-8.5, nearly all soils with pH values above 8 have a ....., while soil with pH values below 4 generally.....?
- 11- ....., is define as the transformation of organic matter into humus?
- 12- The dominant form of phosphorus available to plants exists in the soil solution mainly as ....., above pH 7.2?

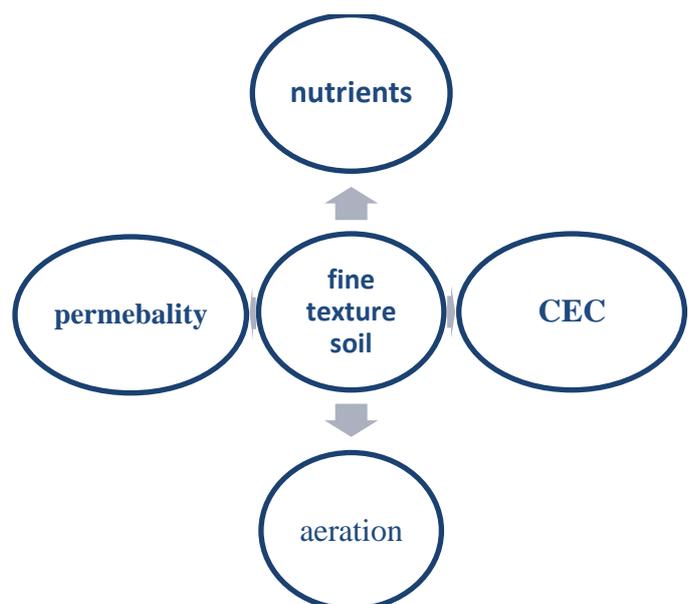
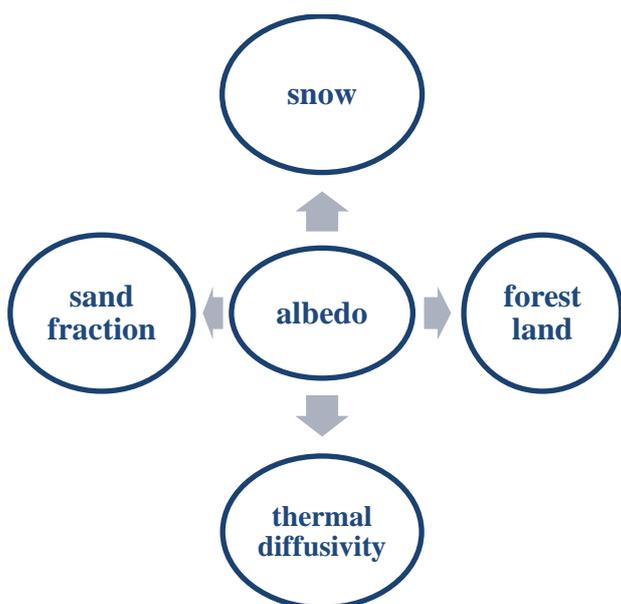
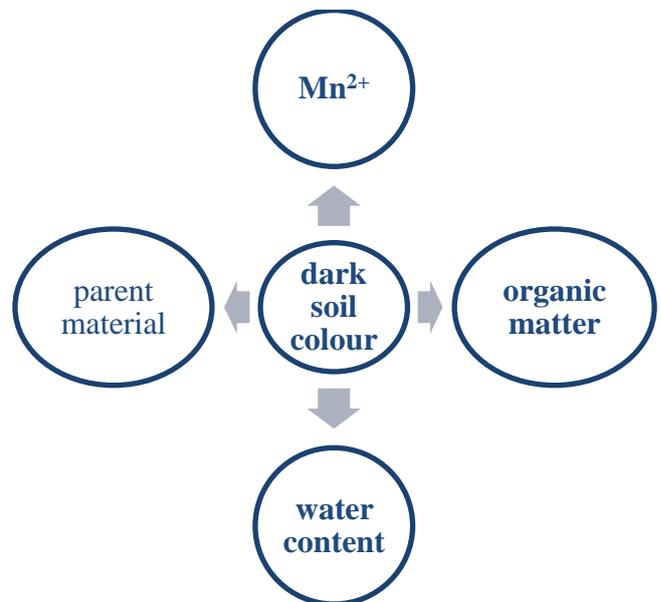
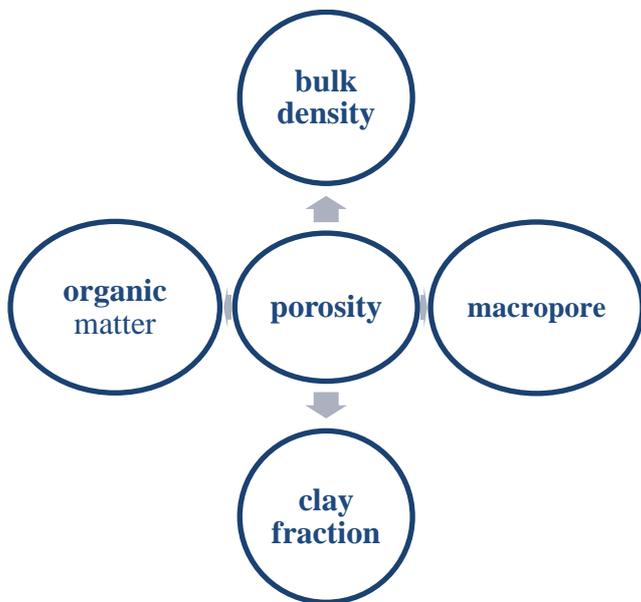
**Q75/ The Munsell notation distinguishes three characteristics of the color: hue, value, and chroma, explain them by illustration, then discuss in briefly the factors influenced soil color.?**

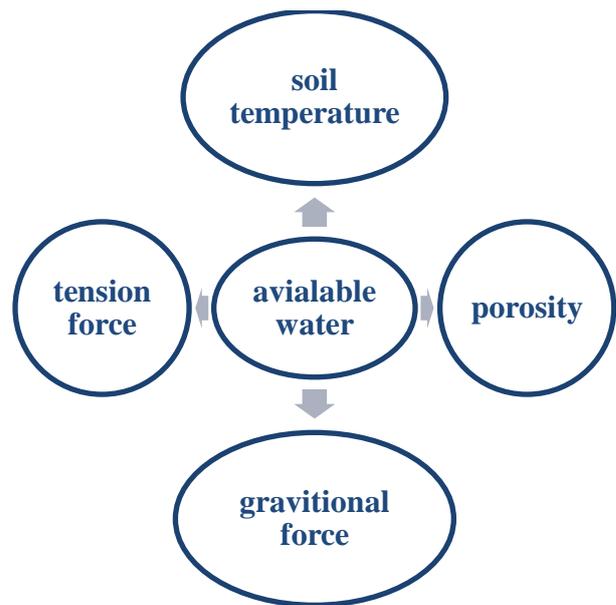
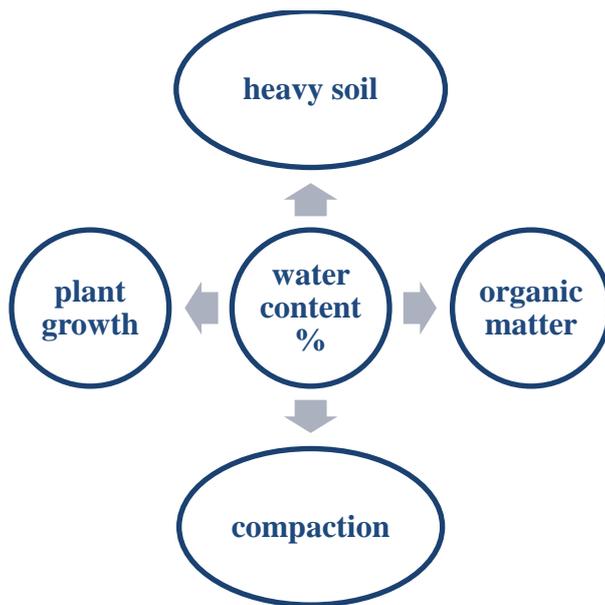
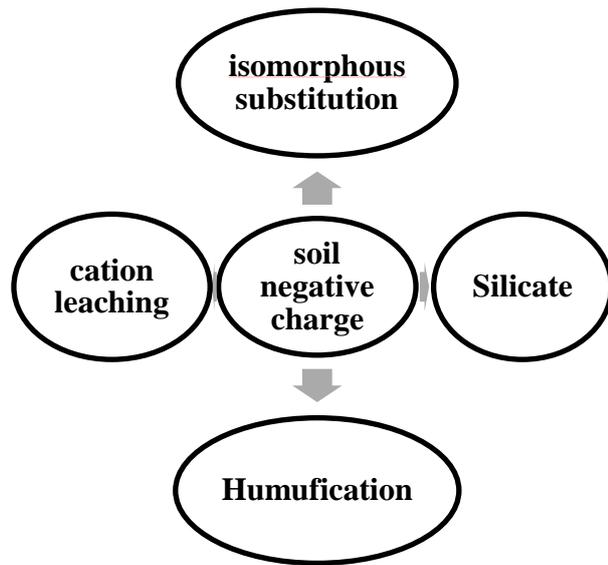
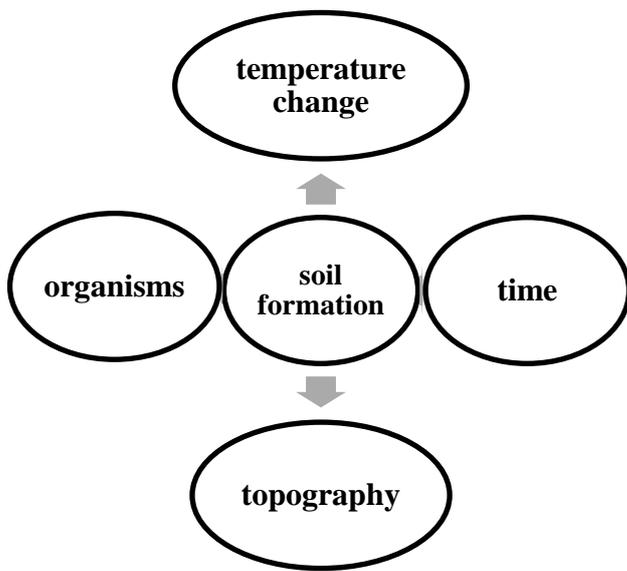
**Q76/Count the major types of clay minerals, then Explain their important?**

Q77/ Define the CEC, write the type of ion exchange, then explain the relation ship between pH and CEC. ?

Q78/ Plant-derived compounds fall into five categories? Explain them in briefly?

Q79/Write the relationship among the following by direct and inverse term? **Cancelling (64marks)**





**Q80/Enumerate the following? (36marks)**

**1-The most common silicate mineral ?**

**2-Types of soil temperature?**

**3-Soil processes?**