**SOIL FERTILITY 1 (ORGANIC MANURE)**

 This topic entails the following:

* Characteristics of a fertile soil
* How soil loses soil fertility
* Soil fertility maintenance
* Reasons of adding organic matter to soil
* Disadvantages of organic manure
* Types of organic manure i.e green manure, farm yard manure and compost measure.

 The following relevant questions and their answers in this topic will greatly help the user to comprehend and understand the required concepts and practices:

1. State **two** roles of humus in the soil that are beneficial to crops

2. List **four** characteristic of fertile soil

3. The diagram below illustrates a compost heap. Study it and answer the questions that follow

 a) Name the part labeled **Q** and state its function

b) What is the function of each of the following components in preparation of compost manure

 i) Top soil

 ii) Wood ash

 iii) Rotten manure

4. The illustration below shows a four heap system of making compost manure. Study it and answer

 the questions that follow.

 (a) By use of arrows indicate on the diagram above how the following material should be

 transferred from one heap to another till the manure is applied in the field

 (b) How long does the material take to be ready for application in the field as manure?

 (c) Give a reason for turning the material in the heap regularly

 (d) Give **two** reasons why it is necessary to sprinkle water on the heap

5. Name **four** indicators of well-decomposed manure

6. (a) State **two** factors that should be considered when siting a compost manure heap

(b) When preparing compost manure, explain the importance of each of the following:-

 (i) Addition of ash

 (ii) Regular turning of the compost manure

7. What is **leaching**?

8. State **four** advantages of adding organic matter to a sandy soil

9. (a) Describe the preparation of the following farm materials:-

 (i) Farm yard manure

 (ii) Hay

 (b) Explain the factors considered in timely planting of annual crops

10. A ration containing 18% protein is to be made from maize and sunflower cake. Given

 that maize contains 7% protein, and sunflower seed cake 34% protein. Use Pearson square

 method to calculate the value of feedstuffs to be used to prepare 100kgs of the feed

 ii) A part from Pearson square method, name **two** other methods that can be used to formulate

 feed ration

**SOIL FERTILITY 1 (ORGANIC MANURE)**

1. two roles of humus in the soil that are beneficial to crops

* Provide nutrients
* Increase water holding capacity
* Increase soil temperature

Neutral soil PH

2. four characteristic of fertile soil (2mks)

* Well drained
* Correct PH
* Good water holding capacity
* Adequate plant nutrients
* Free from pest and diseases
* Correct soil nutrients

3. a) Q-stick√

 Function-checking temperature√ and other conditions within the heap

b) i) Top soil-introduces organisms to effect composition√

 ii) Wood ash-increases the level of phosphorus and potassium√

 iii) Rotten manure-provides food for micro-organism√

4. The illustration below shows a heap system of making compost manure. Study it and answer

the questions that follow.

a) use of arrows indicate how the decomposing material should be transferred from one heap

 to another till the manure is applied in the field.

b)- 3 - 6 wks

c) one reason for turning the material in the heap regularly.

- Proper decomposition.

- Facilitate air circulation.

- Microbial activities.

 d) two reasons why it is necessary to sprinkle water on the heap.

 - To regulate the internal temperatures in the heap.

 - Create moist environment for microbial activity.

5. Four indicators of well-decomposed manure

* Absence of bad odour and instead the smell of forest soil
* Light weight
* Brown colour
* Moist but not wet
* - Original nature of material not noticeable (½ x 4pts = 2mks)

6. (a) Two factors that should be considered when siting a compost manure heap are:-

* Accessibility
* Drainage
* Direction of prevailing wind
* Size of the farm/proximity

(b) Five advantages of rotation grazing are: (5mks)

* Livestock with maximum use of pastures
* Reduces build up of parasites and diseases
* Animal waste evenly distributed
* Pasture area given time to regenerate
* Excess pasture conserved
* Possible to apply fertilizer in the parts of the pasture which are not in use (5x1=5mks)

7. It is movement of dissolved nutrients front p soil to lower horizons of soil becoming

Unravel able to crops

8.

* Improves soil structure
* Adds nutrients
* Increases cation exchange capacity
* Increases microbial activity in the soil
* Improves water holding capacity/ reduces leaching
* Buffers soil PH

Moderates soil temperature

9. (a) (i) Preparation of farm yard manure:-

* Collect animal waste/refuse/dung and urine;
* Collect animal bedding/litter and other rotten plant residues;
* Store collected materials under roof/shed to prevent leaching and oxidization of nutrients;
* Turnover the materials regularly;
* Sprinkle water if dry;
* leave the material to rote completely before use; (6x1=6mks)

(ii) Preparation of Hay

* Cut the grass /legume in the field when 50% of it is starting to flower;
* The cut forage is spread in the field for four continuous days (sunny days)
* The cut forage is turned daily for even for four uniform drying;
* Gather the dried material in a central spot;
* Bale the material;
* Properly store the baled hay (6x1=6mks)

(b) Factors to consider in timely planting of annual crops

* Escape from serious weed competition;
* Utilization of early rainfall;
* Exploitation of Nitrogen flush in the soil that has accumulated during dry season;
* Escape from serious pest + disease attack e.g. stalk borer in maize;
* Fetch high market prices when harvested early;
* Reduce competition for labour during labour peak period;
* For harvesting season to coincide with dry period to reduce losses e.g. cotton

Early planting means early farming/calendar for the farmer to enable him /her to finish up other farm activities; (8x1=8mks)

10. i) A ration containing 18% protein is to be made from maize and sunflower cake. Given

 that maize contains 7% protein, and sunflower seed cake 34% protein. Use Pearson square

 methods to calculate the value of feedstuffs to be used to prepare 100kgs of the feed (3mks)

ii) two other methods that can be used to formulate feed ration (2mks)

* Linear programming
* Trial and error

Graphical method.