Model answer

Semester	**:**	**V (New)**	**Aca. Year**	**:**	**2021-22**
Course No.	**:**	**SSAC -353**	**Title**	**:**	**Manures, Fertilizers & Soil Fertility Management**
Credits	**:**	**2+1=3**	**Total Marks**	**:**	**80**
Day and Date		**27.11.2021**	**Time**	**:**	**3 hrs**

Section "A"

Write Answer in 4-5 sentences

Q.1 **What are essential elements. Give classification of essential elements with examples**

Essential elements Plants (16): C, H, O, N, P, K, Ca, Mg, S, Fe, Mn, Zn, Cu, Mo, Cl and B.

Basic Nutrients:

carbon, hydrogen and oxygen

Macronutrients:

N, P, K, Ca, Mg, and S.

Micronutrients:

Fe, Zn, Cu, B, Mo and Cl.

Q 2 **Differentiate between Manures and Fertilizers**

Charecter	Organic Manures	Fertilizers
Quantity	Used in large quantities. Ex. 5000 to 10000 kg	Used in relatively small quantity 20 to 200 kg
Nutrient Content	Provide all essential plant nutrients but in relatively low nutrient contents	Fertilizer contains at one or two of the plant nutrients in chemical form
Use	Excessive use do not affect soil properties	Excessive use can make soil poor
Organic Matter water holding capacity	Organic Matter water holding capacity	No build-up of SOM No such effect

Q 3 **Define composting and enlist different types of composting.**

Composting is a process of allowing organic materials to decompose in more or less controlled conditions to produce stabilized product that can be used as a manure or soil amendment.

The Indore process (Howard and Wad)

The Bangalore process (C.N.Acharya)

The NADEP method

Q 4 **Define Integrated Nutrient Management (INM) and discuss components of INM**

INM means the supply of nutrients to the plant from various sources of nutrient INM an at maintenance or adjustment of soil fertility and of plant nutrient supply optimum level for sustaining the desired crop productivity through optimization of benefits from all possible sources of plant nutrients an integrated manner.

Components: Organic manures, fertilizers, biofertilizers, crop rotation etc

Q 5 **Classify phosphatic fertilizers based on solubility with suitable examples**

1.Water soluble phosphate :single super phosphate, diammonium phosphate

2. Citric Acid – soluble phosphates: basic slag, dicalcium phosphate, rhenania phosphate

3. Insoluble phosphates: rock phosphate, bone meal

Q 6 **Define organic manures and give significance of C:N ratio**

C:N ratio can be defined as ratio of weight of organic carbon to total nitrogen of soil or organic matter.

There are two types of C:N ratio wide and narrow C:N ratio. When organic carbon content is more than total nitrogen the ratio is called as wide and when organic carbon content is less than total nitrogen then it is called as narrow C:N ratio.

Wider C:N ratio results in slow decomposition rate and immobilization of nutrients

Narrow C:N ratio facilitates faster decomposition and nutrient release

How?

It is process by which the mineral element is taken up by plants and enters in cellular material

1. Passive uptake: mass flow, contact exchange theory, carbonic acid theory Donnan equilibrium

Active uptake: Carrier concept, cytochrome phump theory

Q 8 Give a brief note on oil cakes

Oil cakes are concentrated organic manures

These are plant originated concentrated organic manures

Broadly classified as edible and non-edible oil cakes

edible cakes ex. Neem cake, caster cake and non-edible oil cakes ex ground nut cake, linseed cake, sesame cake etc

Q 9 **Discuss micronutrient fertilizers with examples**

Fertilizers supplying micronutrients ferrous sulphate mangnous sulphate, borax, boric acid zinc oxide, zinc sulphate etc

Q 10 **Discuss in brief slow release nitrogen fertilizers**

Nitrogenous fertilizers coated with different materials to increase efficiency neem coated urea, sulphur coated urea etc

Section "B"

Answer the following in one sentence

1 **Concentrated organic manures:** Organic manures of organic origin having lesser volume of organic matter per unit nutrient content.

2 **Give Nutrient content of**

Ammonium Nitrate 35% N

Calcium Nitrate 15.5% N

3 **Give name of two green leaf manuring crops**: Glyricidia, Karanji (Pongamia glabra), Subabul

4 **What is mass flow:** Nutrients in the form of ion are absorbed by the plant roots with mass flow of water under the effect of transpiration

5 **Enlist essential micro nutrients with their ionic forms**

Mineral element	Ionic form	Non-ionic form
Iron (Fe)	Fe2+, Fe3+	FeSO4 with EDTA

Zinc (Zn)	Zn2+	ZnSO4 with EDTA
Copper (Cu)	Cu2+	CuSO4 with EDTA
Boron (8)	B4O72-, H2BO3-, HB032-	
Molybdenum (Mo)	Mo O42-	
Chlorine (Cl)	Cl	

6 **Fertilizer:** Fertilizer is any material of natural or synthetic origin added to the soil to supply one or more plant nutrients.

7 **Manure:** Manures are plant and animal wastes that are used as sources of plant nutrients.

8 **Enlist organic nitrogen fertilizers:** Urea [CO (NH2)2]
Calcium cyanamide (CaCN2)

9 **Enlist two minerals of potassium used as raw materials for K fertilizers** : Sylvinite (KCl), Carnalite: KCl.MgCl2.6H2O, Kainite: KCl.MgS04.3H2O

10 **Sewage:** In the modern system of sanitation adopted in cities and towns human excreta is flushed out with water which is called sewage.

11 **Night soil:** Human excreta collected and dumped in trenches for manurial purpose is called as night soil.

12 **Enlist two micronutrient fertilizers** : Zinc sulphate (ZnSO4 7H2O) , Copper sulphate (CuSO4 5H2O)

13 **Give two examples of complex fertilizers**: Potassium nitrate, Ammonium phosphate, Diammonium phosphate

14 **Vermicompost:** Vermicompost also called worm castings, worm humus, worm manure, or worm faeces is the end-product of the breakdown of organic matter by earthworms.

Section "C"

Choose correct option

1 An element is essential for plants when it is---------

d. directly involved in the metabolism of the plant

c. Melich 1984

3 Plants take nutrients ---------

c. in ionic form

4 Which one of the following organic manures has the narrowest C/N ratio?

a. Groundnut cake

5 Raw material for manufacturing phosphatic fertilizers.

b. Rock Phosphate

6 Green manure crops belongs to family.

a. Leguminosae

7 The ---------- refers to the refuse from farm animals, mainly sheep, cattle and poultry.

a. FYM

8 What is the most valuable element in these organic fertilizers?

d. Nitrogen

9 Single super phosphate contains phosphorus mostly in

c. Water soluble form

10 What is the term for crop that is grown and ploughed to be used as manure?

d. Green Manure crop

11 It is the absorption of minerals without direct expenditure of metabolic energy.

d. Both a and c

12 -------- results in slow decomposition rate and immobilization of Nutrients.

a. Wider C:N ratio

13 Decoposition of organic matter is ------ in beginning and then continues with ------- rate.

b. Slow, Increasing

14 Microbial test for available phosphorus in soil is

a. Melich Cunninghamella –plaque test

15 Composted manure is formed from

c. green and farmyard manure

elsewhere viz., trees, herbs, shrubs pruning and unwanted weeds is ----------

c. Green Leaf Manuring

17 The term bulky organic manure generally includes those materials of natural origin, organic in composition having ---------- per unit content of nutrients.

b. greater volume

18 Ammonium sulphate

a. Complex fertilizer

19 ---------- is not included in organic farming

b. chemical fertilizer

20 Basic slag and dicalcium phosphate are -------- P fertilizers.

b. Citric Acid soluble

21 ---------- is preferred for fertilization of crops like tobacco, potato etc., where quality is of prime importance.

c. K_2SO_4

22 Fertilizer control order came in force in year------

b. 1985

23 ---------- is a best inoculant used for composting.

c. cow dung

24 An increase in transpiration pull increases the uptake of ions by the roots describes----------

a. Mass flow