

27. Pesticides are used in very accurate concentration and in a very appropriate manner, because if used in excess it

- (i) harms the soil and causes loss of fertility.
- (ii) checks the replenishment of organic matter.
- (iii) kills the microorganisms of the soil.
- (iv) causes air, water and soil pollution.
- (v) passes into ground water and make it toxic biota.
- (vi) enter the crop plants and make them toxic.
- (vii) pass into surface water and harm the aquatic organisms.

28. **Animal Feed** : It means food provided to the animal, which are of two types :

- (i) **Roughage** : It is a coarse and fibrous food with low-nutrition, such as green fodder, silage, hay and legumes.
- (ii) **Concentrates** : These are the substances which are rich in one or more nutrients. Cotton seeds, oil seeds, oil cakes and some cereals like gram and bajra are some typical concentrates.

Food Requirements of Dairy Animals : These are of two types :

- (i) **Maintenance requirement**, which is the food required to support the animal to live in a healthy life, and
- (ii) **Milk producing requirement**, which is the type of food required during the lactation period.

29. Large sized birds require more feed. **Summer adaptation** is connected with egg laying. Little summer adaptation reduces egg laying.

In order to obtain small sized poultry birds having summer adaptability is desirable to

- (i) introduce the exotic birds from outside.
- (ii) cross breed the local birds with exotic birds from outside.

Small size birds are preferred for

- (i) Lower requirement of feed
- (ii) Higher egg laying capacity and
- (iii) Lower requirement for space.

30. To prevent the poultry from diseases the following measures should be taken :

- (i) The poultry birds should be kept in good spacious, airy and ventilated shelter.

(ii) The shelter should be cleaned properly and regularly. Quick and hygienic disposal of excreta should be ensured.

(iii) External parasites should be controlled by applying insecticide solution.

(iv) Disinfectant should be sprayed to kill mosquitoes and other external parasites.

(v) Every animal should be vaccinated at regular interval to minimise it against common infections and diseases.

31. (i) The sudden increase is due to chemical fertiliser that supplies the minerals in good quantity. Gradual decrease is due to depletion of nutrients caused by absorption by plants, leaching to lower layers of the soil and killing of decomposers microbes.

(ii) Manures supply small quantities of nutrients to the soil as it contains large amounts of organic matter. It enriches soil with nutrients thereby increasing soil fertility.

(iii) The difference in the two graphs indicates that manuring the soil is more beneficial than the use of chemical fertilisers. Use of fertilisers is harmful. In case of Plot B the chemical fertilisers may cause various problems when used continuously for long time. Loss of microbial activity reduces decomposition of organic matter and losing soil fertility affecting the yield.

32. Crossword Puzzle

		10	T									
	1	S	U	N	2	F	L	O	6	W	E	R
			N		O			E				
8	M		A		D			E		7	L	
R					D			D			E	
I				E							G	
G				3	R	A	4	B	I		H	
9	A	P	I	S			O				O	
L							R				R	
S			5	N	I	T	R	O	G	E	N	
							N					

Value Based Questions

1. (i) The fruits when plucked from the garden contains lots of dust and dirt. In addition, now-a-days, pesticides re extensively used in the field to protect crop from pests some amount of which remain on the leaves and fruits of the crop. That is why, my father asked to wash the vegetables properly.
- (ii) With our eyes, we cannot determine whether pesticide residues are available on a fruit or vegetable. It can be determined only after undergoing tests in the laboratory. However, if

pesticides are sprayed recently or if the quantity of pesticides sprayed is too high, we can get the smell of pesticide in the fruits or vegetables.

- (iii) Pesticide is used in crop to protect the crop field from pests & insects. We have limited cultivable land whereas population is increasing everyday. The limited crop we get by harvesting in traditional manner is not sufficient to feed the overgrowing population. The only option to get enough crop to feed the growing population is to adopt modern

LONG ANSWER TYPE QUESTIONS

19. **Hybridisation** : It refers to crossing between genetically dissimilar plants. This crossing may be of three types :

- (i) **Inter varietal** i.e., cross-breeding between two different varieties.
- (ii) **Interspecific** i.e., cross-breeding between two different species of the same genus.
- (iii) **Inter generic** i.e., cross-breeding between different genera.

In plant breeding, intervarietal hybridisation is extensively used.

The breeding methods viz., introduction, selection and hybridisation have been used to develop number of improved varieties of plants of HYV (High-Yielding Variety).

20. (i) **Vermicompost** is a manure rich in pulverised organic matter and nutrients. The compost prepared by using earthworms to hasten the process of decomposition of plants and animals refuse.

(ii) **Green manure** is prepared by decomposing green plants in field itself.

Example: Sun hemp is grown in fields, mulched by ploughing and allowed to decompose in field for the preparation of green manure.

(iii) **Bio-fertiliser:** are living organisms used as fertiliser to supply the nutrients to crop plants.

Example: Nitrogen fixing blue green algae, nitrogen fixing bacteria which fix nitrogen in soil, rice fields, are called as biofertiliser.

21. The various methods of weed control are:

(i) **Mechanical Methods:** Uprooting, weeding, hand hoeing, interculture, ploughing, burning and flooding.

(ii) **Cultural Methods:** Proper seed bed preparation, timely sowing of crops, intercropping and crop rotation.

(iii) **Chemical Methods:** Spraying of chemicals like herbicides or weedicides.

(iv) **Biological Control:** Use of insects or some organisms which consume and destroy the weed plants.

Example: Prickly-pear cactus (*Opuntia*) is controlled by cochineal insect and aquatic weeds are controlled by fish grass carp.

22. (i) **Differences :**

Capture fishery	Culture fishery
(a) It is a method of obtaining fish from natural source.	(a) It is a method of obtaining fish from fish farming.
(b) It is undertaken in both inland and marine waters.	(b) It is undertaken mostly inland and near sea shore.
(c) There is no seeding and raising of fish.	(c) The fish is reared.

(ii) **Differences :**

Bee-keeping	Poultry farming
(a) It is a practice of rearing, care and management of honeybees.	(a) It is the practice of raising domestic fowl.
(b) It provides honeybee wax and related products.	(b) It provides eggs and meat.
(c) Bees obtain food from flowers.	(c) Poultry birds are provided food by the rearers.

23. **Merits of Fish Culture**

(i) Large amount of desired fishes can be obtained in small area.

(ii) Improvement can be done.

Demerits of Fish Culture

(i) It is a threat to bio-diversity.

(ii) Only economically important and valued fishes will be cultured.

24. **Composite fish culture** is the most prevalent and advantageous system of fish culture. In such a system, a combination of five or six fish species is used in a single fish pond. These fish have different food habits and do not compete each other for food.

For examples, Cattle is a surface feeder, Rohu feeds in the middle of the pond (column feeder), Mrigal and common carp feed at the bottom and grass carp feeds on aquatic plants in the pond.

25. - Bee-keeping needs low investments, so farmers use it as additional income generating activity.

- Besides honey, other products of bee-keeping are beeswax, propolis, bee venom and royal jelly.

- Bee-keeping also helps in cross pollination of crops because honey bees transfer pollen grains from one flower to another while collecting nectar.

Bee-keeping should be done in good pasturage because it provides more quantity and quality of nectar for honey to honeybees. Taste of honey also depend on pasturage.

26. The modes by which insects affect the crop yield are cutting plant parts, sucking cell sap and borers.

Insect Pests : Many insects are serious pests of plants and they attack all stages, parts and products of crop plants. Based on the mode of attack, the insect pests are of following three types :

(i) **Chewing insects :** They cut and chew root, stem and leaves of the plants with the help of their chewing type of mouth parts. e.g., grasshoppers, locusts, etc.

(ii) **Sucking insects :** They suck the cell sap from different parts by the plants with the help of their piercing and sucking mouth parts. e.g., aphids, leaf hoppers, etc.

(iii) **Borer insects :** They bore and enter different plant parts and feed on the plant tissues. e.g., sugarcane borer, cotton ball weevil, etc.

- (a) quality seed will provide genotypes for various characters such as resistance, input response, quality and higher yield.
 (b) proper irrigation methods fulfil water requirement of crop at proper time.

- (c) fertilisers will provide required nutrients.
 (d) crop protection measures will check loss of crop and crop yield.

Thus, farmers will get maximum benefit for their input in the form of good seeds (genotype) and agronomic approaches.

NCERT Exemplar Problems

SHORT ANSWER TYPE QUESTIONS

- (a) — (ii) (b) — (iii) (c) — (i) (d) — (iv)
- (a) protein (b) fodder (c) *Kharif*
(d) Vegetables (e) *Rabi*
- Genetically modified (GM) crop is the one which has been developed by introducing some specific gene from any other source, to obtain the desired character.
Example : Bt. cotton is made insect-resistant by introducing a new gene from a bacteria.
- Useful traits of improved crops are
 - improved nutritional quality
 - higher yield
 - resistance to biotic and abiotic stresses
 - change in maturity
 - wide adaptability
 - desired agronomic traits
- Organic matter is important for crops because
 - it forms humus and makes the soil fertile.
 - it improves soil structure.
 - it increases water holding capacity of sandy soil.
 - it improves aeration of clayey soil.
 - it helps in drainage and in avoiding water logging.
 - it liberates minerals which enrich the soil during decomposition.
 - it improves growth of crop plants with the help of biochemicals present in it.
- Excess use of fertilisers causes
 - environmental pollution as their residual and unused amounts will become pollutants for air, water and soil.
 - excess minerals in crop plants.
 - salination of soil.
 - eutrophication of water bodies.
- (a) Organic farming (b) Mixed cropping
(c) Intercropping (d) Crop rotation
(e) weeds (f) pathogen
- (a) — (iii), (b) — (v), (c) — (iv), (d) — (i),
(e) — (ii)
- For better cropping farmers of low rainfall area will be suggested to —
 - enrich the soil with humus which increases the water-holding capacity and retains water for longer duration.
 - use of drought resistant and early maturing varieties of crops.
 - reduce tilling.
- Energy yielding — Wheat, rice, maize
 Protein yielding — Gram, pigeon gram, lentil, soya bean

Oil yielding — Groundnut, castor, mustard, soya bean
 Fodder crops — Barseem, oat, sudan grass

11. **Hybridisation** : It refers to crossing between genetically dissimilar organisms.

Photoperiod : It is the response of an organism to changes in day length, i.e., photoperiods are related to the duration of sunlight. Growth of plants and flowering are dependent on sunlight.

12. (a) Flowering of plants (b) June to October
(c) November to April (d) *Kharif*
(e) *Rabi*

13. The cultivation practices of different crops require different climatic conditions. Some require high temperature, low temperature, longer duration of sunlight, shorter duration of sunlight, more humidity, low humidity, moderate humidity, sandy soil, loamy soil, etc.

In plains, two major seasons for crop plants are *Kharif* for rainy season and *Rabi* for winter season.

Apples are grown in hilly regions with low temperature.

14. (a) 16 (b) Carbon and Oxygen
(c) Hydrogen (d) 13
(e) Six, macronutrients (f) Seven, micronutrients

15. **Differences :**

Compost	Vermicompost
(i) It is prepared from all types of organic remains like garbage, sewage, sludge, animal waste, straw, weeds, etc.	(i) It is prepared from domestic waste, vegetable waste, weeds and farm refuge.
(ii) Organic remains are decomposed by microbes.	(ii) Organic remains are pulverised by earthworm.

16. (b) → (c) → (a) → (d)
17. **Merits of Italian bee variety *Apis mellifera***
 (i) It has high honey collection capacity.
 (ii) It stings less.
 (iii) It stays in the same bee-hive for long periods and breeds very well.
18. Higher yield can be obtained by employing high yielding varieties, improved farming practices, modern technology, latest agricultural machines and implements, nutrient supply, etc., which all require high cost. Therefore, farmers purchasing capacity for inputs determines the cropping system and production practices.

14. The various preventive measures should be taken for storage of food grains:

- (i) **Drying:** The food grains should be properly sun dried. The moisture content of the food grain should be less than 9%.
- (ii) **Maintenance of Hygiene:** The food grains should be free from insects. Godown or storage should be cleaned properly. All cracks in the floor, walls and ceiling must be sealed. Gunnybags or earthen pots must be cleaned and dried in the Sun.
- (iii) **Prophylactic Treatment:** Godown and the storage must be treated with chemical spray or fumigation, seedgrains must be given a treatment with insecticide or fungicide.
- (iv) **Improved Storage Structure:** The dried and cleaned foodgrains should be stored in gunny-bags or in other storage structure. The gunny-bags containing food grains should be stored in a row, away from wall and about 6 inches above from floor on wooden platforms. Space should be provided between the stacks for periodic inspection, spraying and fumigation.

Some airtight, moisture-proof, rodent proof and thermally insulated storage structures have been developed by various organisations.

For example, Pusa bin, Pusa cubicle, Pusa kothar and Pant kuthala are some such structures.

15. Any organism that causes economic damage or loss to the crop is known as pest.

Effect on crop: Insect pests are more dangerous. Insects cause great damage to crop plants in various stages of their growth starting from sowing of seed to storage. They also transmit numerous disease causing viruses, bacteria which cause serious damage to the crops. Some of the insect pests are :

- (i) Locusts and grasshopper cause serious damage to the foliage.
- (ii) Bugs and larvae eat and chew up the leaves and tender shoots.
- (iii) Caterpillar larvae cause serious damage to the plants.
- (iv) Termites and white ants cause serious damage to underground parts of the plants.
- (v) Aphids and ants suck up the sap of the plant organs.

16. (i) **Macronutrients:** The essential elements utilised by plants relatively in large quantities are called major nutrients or macronutrients. The six essential nutrients form the macronutrients — Nitrogen, Phosphorus, Potassium, Calcium, Magnesium and Sulphur.

Of these six macronutrients, nitrogen, phosphorus and potassium (*i.e.*, NPK) are required by plants in greater amounts and are called primary elements or primary nutrients.

(ii) **Micronutrients:** They are the essential elements which are used by plants in small quantities or traces. The seven essential nutrients form the micronutrients. These are Iron, Manganese, Boron, Zinc, Copper, Molybdenum and Chlorine. A farmer supplies these nutrients to the crops by

the application of manures and fertilisers, *e.g.*, of manure: Decomposed cow dung and vegetables, *e.g.*, of chemical fertiliser: Urea, ammonium phosphate, NPK and sodium nitrate.

17. The common objectives of varietal improvement:

- (i) **Improved yield:** An introduction to high yielding varieties (HYV) to improve the productivity of economic produce.
- (ii) **Better quality:** Due to competition in the market for better quality product and consciousness of man towards health, better crops and quality products are being introduced and sustained in market. Wheat with better baking quality, pulses with high protein quality, oil quantity of oil seeds and preserving quality of fruits and vegetables, etc., are considered better nowadays.
- (iii) **Biotic and abiotic resistance:** Crops generally suffer due to various biotic and abiotic diseases. Developed varieties which have resistance against these disease can bring significant improvement in crop production.
- (iv) **Early and uniform maturity:** It makes the harvesting process easy and reduces the loss of produce during harvesting. Long duration crops reduce the cost of crop.
- (v) **Photo and thermo-insensitivity:** Most of the crops are very sensitive to high temperature which reduces their quality. By developing insensitive varieties helps in crossing the cultivation boundaries.
- (vi) **Desirable agronomic traits:** For fodder crop the desirable traits are tallness, high tillering and profuse branching but for cereals dwarfness, early maturation and high productivity are desirable characters.
- (vii) **Wider Adaptability:** Developing varieties with wider adaptation will help on stabilising the crop production under different environmental conditions.

18. There are two phases in the life of poultry. These are:

(i) **Growing period:** The period from birth upto the sexual maturity in the life of poultry is called growing period. The chickens during this period are called growers. During this period, a restricted and calculated amount of feed is given to the poultry. During this period, overcrowding suppresses the growth.

(ii) **Laying period:** The period from sexual maturity till the end of egg-laying is called laying period. The chickens during this period are called layers. The layers require enough space and proper lighting.

The diseases are caused in poultry due to:

- (a) Viruses, Bacteria, Fungi, Parasites, etc.
- (b) Nutritional deficiencies.

NCERT Question

19. Conditions given in (iii) Farmers use quality seeds, ad irrigation, use fertilisers and use crop protection measures which are beneficial for farmers because of—

(d) **Biological method:** Some living organisms are introduced into the field which exclusively feed on weed, e.g., *Opuntia* can be controlled by *Cochineal* insect and Aquatic weeds by fish carp.

(a) Animal husbandry is the scientific management of animal livestock.

(b) **Apiary :** The commercial production of honey, bee farms are established which are known as apiary. **Pasturage :** Flowers available to the bees for nectar are called pasturage. Quantity and taste of honey directly depends on pasturage.

(c) Two desirable traits in which cross-breeding between Indian and Foreign breeds are undertaken in poultry farming are

(i) number and quality of chicks

(ii) tolerance to high temperature.

(a) Plants obtain nutrients like carbon and oxygen from air, hydrogen from water and remaining thirteen elements from soil through root absorption.

Macronutrients : The essential elements utilised by plants in relatively large quantities are called major nutrients or macronutrients. Six essential nutrients form the macronutrients — Nitrogen, Phosphorus, Potassium, Calcium, Magnesium and Sulphur. Of these six macronutrients, Nitrogen, Phosphorus and Potassium (i.e., NPK) are required by plants in greater amounts and are called primary nutrients.

Micronutrients : They are the essential elements which are used by plants in small quantities or traces. The seven essential nutrients form the micronutrients. These are Iron, Manganese, Boron, Zinc, Copper, Molybdenum and Chlorine.

(b) Bee-keeping or apiculture is the rearing, care and management of honeybees for obtaining honey, wax and other substances.

Bee-keeping needs low investments, so farmers use it as additional income generating activity.

Besides honey, other products of bee-keeping are beeswax, propolis, bee venom and royal jelly.

The variety of bees commonly used for commercial honey production are *Apis cerana indica*—the Indian bee, *Apis dorsata*—the rock bee and *Apis florea*—the little bee. These variety of honey bees are social, polymorphic insects which live in colonies, nests or hives. The colony has three types of castes—queen, drones and workers.

Important Questions

The unwanted or undesirable plants which grow along with the main crop are termed as weeds.

Weeds affect the growth of crop in the following ways:

- (i) Weeds consume a good part of soil nutrients such as fertilisers, etc.
- (ii) Weeds occupy a good amount of space, which otherwise should have been used by the crop.
- (iii) Weeds spread pests and diseases which destroy the crop.

Examples of weeds are Water hyacinth and Eupatorium.

Various method to control weeds are:

(a) **Mechanical method:** Uprooting weeds with Khurpi or hand ploughing, burning and flooding.

(b) **Cultural method:** Proper seed bed is prepared and seed is sown timely and intercropping and crop rotation is done.

(c) **Chemical method:** Chemicals known as herbicides or weedicides are sprayed, e.g., 2, 4-D, etc.

(d) **Biological method:** Some living organisms are introduced into the field which exclusively feed on weed, e.g., *Opuntia* can be controlled by *Cochineal* insect and Aquatic weeds by fish carp.

11. **Crop rotation** is defined as the practice of growing of different crops on a piece of land in a preplanned succession.

Depending upon the duration, crop rotation is done for different crop combinations. If crop rotation is done properly then two or three crops can be grown in one year with good harvests.

Animal Husbandry is the science of rearing, feeding, caring, breeding and utilisation of animals. In other words, it is the scientific management of animal livestock.

The two exotic breeds of cows are Jersey and Holstein-Friesian.

12. The needs of varietal improvement are :

(i) Higher yield

(ii) Better quality

(iii) To develop disease, insect, pest resistant varieties.

Four common objectives of varietal improvement are as follows :

(i) **Improved yield:** An introduction to high yielding varieties (HYV) to improve the productivity of economic produce.

(ii) **Better quality:** Due to competition in the market, better crops and quality products are being introduced and sustained in market.

(iii) **Biotic and abiotic resistance:** Developed varieties have resistance against the biotic and abiotic diseases and being significant improvement in crop production.

(iv) **Early and uniform maturity:** It makes the harvesting process easy and reduces the loss of produce during harvesting. Long duration crops reduce the cost of crop.

13. (i) **Plant breeding** is defined as science as well as art of important genetic make up of plant in relation to their economic use.

(ii) We should adopt crop rotation because the soil nutrients taken up by one crop are replenished by the rotation of crops.

(iii) Legumes are desired in crop rotation because legumes can replenish nitrogen of the soil. They can fix up the atmospheric nitrogen in the soil in the form of nitrates.

(c) In inter cropping, crops are selected in such a way that their nutrient requirements are different. In crop rotation, crops are selected based on availability of moisture and irrigation facilities.

Advantages:

Inter Cropping: It ensures maximum utilization of the nutrients supplied.

Mix Cropping: The risk of total crop failure due to uncertain monsoon is reduced.

Crop Rotation: It enhances production by increasing the soil fertility.

4. (a) Refer to Q.2. (ii)
 (b) Types of Manures : Based on the kind of biological material used, manures are classified as follows :
 (i) **Vermi-compost** : It is the process when compost is prepared by using earthworms to

hasten the process of decomposition of plants and animal refuse. Here the earthworms help to breakdown the wastes. This activity along with the excreta of the worms makes the compost rich in nutrients.

(ii) **Green Manure** : This practice includes growing or ploughing and mixing of green crops with soil to improve physical structure and soil fertility.

Examples : Both leguminous and non-leguminous plants.

(c) **Advantages of Manures** :

- (i) Manures enrich the soil with nutrients.
 (ii) Manures add organic matter to the soil, which improves soil texture and increases water holding capacity and drainage in soil.

5. (a) **Differences between :**

Manure	Fertiliser
(i) A manure is a natural substance obtained by the decomposition of animal wastes and plant residues.	(i) A fertiliser is a man-made substance. It is an inorganic salt or an organic compound.
(ii) It contains small amounts of essential plant nutrients such as nitrogen, phosphorus and potassium.	(ii) It is very rich in plant nutrients such as nitrogen, phosphorus and potassium.
(iii) It adds great amount of organic matter in the form of humus in the soil.	(iii) It does not add any humus to the soil.
(iv) Nutrients present in the manure are absorbed slowly by the crop plants since manure is not soluble in water.	(iv) Being soluble in water, a fertiliser is readily absorbed by the crop plants.
(v) It is not nutrient specific and tends to remove general deficiency of the soil.	(v) It is nutrient specific and can provide specifically nitrogen, phosphorus and potassium to the soil.

(b) **Advantages of Manures** :

- (i) Manures enrich the soil with nutrients.
 (ii) Manures add organic matter to the soil, which improves soil texture and increases water holding capacity and drainage in soil.

(c) Excessive use of fertilizers destroy soil fertility because the organic matter in the soil is not replenished and micro organisms are hurt.

6. (i) Bee-keeping or apiculture is the rearing, care and management of honey bees for obtaining honey, wax and other substances.
- Bee-keeping needs low investments, so farmers use it as additional income generating activity.
 - Bee-keeping also helps in cross pollination of crops because honey bees transfer pollen grains from one flower to another while collecting nectar.

Apis cerena indica is an Indian variet bee for honey production.

Apis mellifera is an Italian variety bee brought for bee production.

- (ii) (a) They have high honey collection capacity.
 (b) They sting less

- (c) They stay in a given beehive for long period.
 (d) They breed very well.

(iii) Quality of bee depends on the pasturage or flowers available to the bees for nectur collection.

7. (i) Any destructive organism that causes great economic damage, loss by destroying crops are called **pests** in crop production.

Preventive measures to control pests are:

- (a) Cultivation of resistant varieties of crops.
 (b) Sowing the crop at optimum time.
 (c) Clean cultivation.
 (d) Following crop rotation and cropping system.
 (e) Ploughing the field in summer.

(ii) Various methods to control weeds are :

- (a) **Mechanical method:** Uprooting weeds with Khurpi or hand ploughing, burning and flooding.
 (b) **Cultural method:** Proper seed bed is prepared and seed is sown timely and intercropping and crop rotation is done.
 (c) **Chemical method:** Chemicals known as herbicides or weedicides are sprayed, e.g., 2, 4-D, etc.

51. Differences :

Capture fisheries	Mariculture	Aquaculture
Fish obtained by catching from natural resources like rivers, sea, etc., is termed as capture fisheries.	The practice of culture of finned fishes, shellfish mussels, oysters as well as seaweed in marine water is called mariculture.	The practices used to culture fish and aquatic food in reservoirs, estuaries, lagoons, etc. is called aquaculture.

LONG ANSWER TYPE QUESTIONS

|| 5 MARKS ||

Previous Years' Questions

1. (i) Food Requirements of Dairy Animals : These are of two types :
 - (a) Maintenance requirement, which is the food required to support the animal to live in a healthy life, and
 - (b) Milk producing requirement, which is the type of food required during the lactation period.
 - (ii) Various constituents of food of dairy animals are-
 - (a) Animal Feed : It means food provided to the animal, which are of two types :
 - (i) **Roughage** : It is a coarse and fibrous food with low-nutrition, such as green fodder, silage, hay and legumes.
 - (ii) **Concentrates** : These are the substances which are rich in one or more nutrients. Cotton seeds, oil seeds, oil cakes and some cereals like gram and bajra are some typical concentrates.
 - (iii) Cattle need balanced diet containing all nutrients in proportionate amount. A balanced diet promote the health and milk output of dairy animals.
2. (i) There are 16 nutrients essential for plants
 - (ii) (a) **Macronutrients** : The essential elements utilised by plants relatively in large quantities are called major nutrients or macronutrients.

The six essential nutrients form the macronutrients — Nitrogen, Phosphorus, Potassium, Calcium, Magnesium and Sulphur. Of these six macronutrients, nitrogen, phosphorus and potassium (i.e., NPK) are required by plants in greater amounts and are called primary elements or primary nutrients.

(b) **Micronutrients** : They are the essential elements which are used by plants in small quantities or traces. The seven essential nutrients form the micronutrients. These are Iron, Manganese, Boron, Zinc, Copper, Molybdenum and Chlorine.

(iii) Sources of Essential Plant Nutrients : On the basis of the sources, essential plant nutrients are classified as follows :

Source	Nutrients
Air	Carbon, Oxygen
Water	Hydrogen
Soil	(i) Macronutrients : Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, Sulphur. (ii) Micronutrients : Iron, Manganese, Boron, Zinc, Copper, Molybdenum, Chlorine.

3. (a) **Differences between :**

Mixed Cropping	Intercropping
(i) It has target to minimise risk of crop failure.	(i) It has target to increase productivity per unit area.
(ii) Seeds of two crops are mixed before sowing.	(ii) Seeds of two crops are not mixed.
(iii) It involves no set pattern of rows of crops.	(iii) It involves set patterns of rows of crops.
(iv) In this method there is a difficulty of fertiliser application to individual crops.	(iv) Intercropping fertiliser can be applied as per need of the crops.
(v) Spraying for pest control to individual crop is difficult.	(v) Pesticides can be easily applied to individual crop.
(vi) Harvesting and threshing of crops separately not possible.	(vi) Both crops can be easily harvested and threshed separately.
(vii) Marketing and consumption of only mixed produce is possible.	(vii) Product of each crop can be marketed and consumed separately.

Example of mixed cropping is Wheat + Mustard

Example of Inter cropping is Soyabean + Maize

- (b) In crop rotation, different crops are planted on the same plot of land in succession. In mixed cropping and inter cropping, 2 or more crops are grown simultaneously on the same field.

- (iv) **Honey flow and seasons:** At a given location in a season the duration of availability of abundance of flora is responsible for yield of yield. This total time period of bees collect nectar and pollen is called honey flow period.
- (v) **Swarming:** The new queen leaves the old hive to produce offsprings and takes a new shelter which is called swarming.
- (vi) **Selection of variety and site for bee keeping:** Less swarming variety is selected and suitable site for apiary should have a good pasturage with longer honey flow period.
- (vii) Honeybees generally get bacterial and viral diseases. Common pests of bees are wasps, wax moths and mites King crow prey upon bees.
43. There are three types of castes in one colony:
- (i) **Queen:** She is the mother of the colony and responsible for laying eggs. A queen lays both fertile and unfertile eggs. Queen and workers emerge from fertile eggs, whereas drones come out from unfertilised eggs.
- (ii) **Drones:** They are males of the colony and mate with queen and remain in the colony to sleep and eat honey.
- (iii) **Workers:** These are the most active members of the colony which have all responsibilities. They are females but cannot reproduce. Workers during first half of their life cycle do indoor duties and during second half become field workers and perform duties outside the colony. As field workers they collect nectar, pollen, propolis. Workers as guards are security force of the colony.

NCERT Questions

44. Management practices common in dairy and poultry farming are :
- (i) Proper cleaning and hygienic conditions in housing and shelters.
- (ii) Well ventilated and maintenance of temperatures in shelters and housing.
- (iii) Prevention and control of diseases and pests.
- (iv) Proper feeding management.
45. The desirable characters of bee varieties suitable for honey production are :
- (i) Gentleness in nature.
- (ii) Good honey collection capacity.
- (iii) Prolific queen production with less swarming.
- (iv) Ability to protect itself from enemies.
46. Pasturage is the flora available for nectar. The value or quality of honey depends upon the pasturage or flora available for nectar and pollen collection. Availability of flora or pasturage should be in the vicinity of apiary to facilitate nectar collection. Pollens serve as protein food for bees.
47. One method of crop production which ensures high yield is crop rotation.
- Crop Rotation:** It is defined as the practice of growing of different crops on a piece of land in a preplanned succession.
- Depending upon the duration, crop rotation is done for different crop combinations. If crop rotation is done properly then two or three crops can be grown in one year with good harvests.

Advantages of Crop Rotation:

- (i) Crop rotation helps in replenishment of fertility.
- (ii) It prevents depletion of selective nutrients.
- (iii) It prevents building up of diseases and pests on particular crop.
- (iv) It enhances the production by increasing fertility.

48. Advantages of Intercropping:

- (i) It ensures maximum utilisation of the nutrients supplied.
- (ii) It also prevents pests and diseases from spreading to all the plants belonging to one crop in a field. In this way, both crops can give better yield.
- (iii) Soil erosion is effectively arrested.
- (iv) It helps to maintain soil fertility.

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49. Genetic manipulation is the incorporation of desirable characters into other varieties. It is useful in agricultural practices because it produces crops which have higher yield, improved quality and biotic and abiotic resistance.
50. Storage grain losses occur due to the following factors:

- (i) **Biotic factors** such as rodents, birds, insects, bacteria, mites, etc.
- (a) **Damage due to Rodents :** The rodents consume a large amount of crops and contaminate food by their excreta and urine.
- (b) **Damage caused by Birds :** Birds consume and damage stored grains and vegetables. Food grains are contaminated by feathers and droppings and excreta.
- (c) **Damage due to Insects and Microorganisms :** Infestation done by insects and microorganisms reduce the nutritive value of food grains and spoil them.
- (d) **Action of Enzyme :** Enzymes present in fruits, meat and fish catalyse the ripening reaction and damage them.
- (ii) **Abiotic factors** such as—
- (a) **Effect of temperature :** The microorganisms and enzymes are most active between 10°C and 40°C and damage food substances.
- (b) **Effect of moisture content in food :** If the moisture content in stored food is more than 14% it leads to growth of microorganisms, fungi and moulds. It leads to the heating of food grains.
- (c) **Effect of material of containers :** Metallic containers used to store food are harmful and poisonous. Citrus fruits should not be stored in copper container.

management practices. Pesticides protect crops from pest and thereby loss of crop is prevented. If pesticides are banned, pests will destroy lots of food and there will be shortage of food.

2. (i) Bird flu also known as avian influenza is a disease caused by an influenza virus that primarily affects birds. It is found in milder form in wild birds. But a severe form of the bird flu virus is found among poultry birds. While transmission of bird flu by wild birds is not common, transmission by poultry birds from one another is very common.
- (ii) People who are in direct contact with the infected birds are most likely to get infected. These include poultry farmers and veterinary workers.
- (iii) The farmer should immediately inform the nearest veterinary office about his observation. He should allow removal of the infected birds by the veterinary officials.
3. (i) Mr Bordoloi should avoid fried items, high salt and milk products like cream, ghee, butter etc.
- (ii) Mr Bordoloi should do brisk walking at least for 20 minutes everyday.
- (iii) These are life style diseases. Lack of physical activity, intake of junk food and processed food are few reasons for increasing cases of high BP and high cholesterol among children.
4. (i) As the number of members in the family increases, requirement of food in the family has also increased. However, the area of cultivable land for the family remained same. Yield from the crop land also remained same due to continuation with the same methods of cultivation. This led to shortage of food for the family.
- (ii) The college boy has shown an attitude to help others. This is a highly appreciable attitude, which everybody must possess.
- (iii) The boy can search the internet to find out various ways to improve production of food. He can approach the nearest agricultural officer and learn from him the modern practices of cultivation. The boy can then communicate the same to the farmer and guide him in improving yield from his field.
- (iv) One of the main reasons for the problem of the farmer is the increase in number of members in the family. If the increase in population of the country is not controlled, shortage of food will be the largest problem for India. Lack of education is another main reason for the problem of the farmer. Proper education could have enabled the farmer to read books and browse internet to know about the modern agricultural practices. Illiteracy is a big challenge to our country. If people are educated, their knowledge on various field will increase which will help them in finding solution to their problems.
- (v) The Govt. has taken many steps to control population and increase literacy rate. Few of them are:

- (a) People are made aware about the ill effects of having more children through print and electronic media.
- (b) Awareness is created about the availability of various methods of population control.
- (c) Birth control measures are made available through hospitals and primary health centers.
- (d) "Right to education" has been made a reality for the people of the country.
- (e) New schools are established in every village of the country.
- (f) People are encouraged to go to the schools providing free textbooks, mid-day meals etc.
5. (i) I do not support the idea of my father. Excess food for 5 persons will lead to wastage of food. Food is precious and there is shortage of food in this world. There are lots of people in our country who are not able to manage two meals daily. Hence there should not be any wastage of food.
- (ii) My mother does not want to waste any food. A large get-together, one or two additional persons can always be accommodated with the help of additional food. If the food is made for 12 persons, 15 people can easily be accommodated. Hence my mother wants to make food for 15 persons only.
- (iii) The excess food can be distributed among poor people. Small quantity of excess food can be stored in the refrigerator for a day or two before its consumption. Under no circumstances, it should be wasted.
- (iv) The problem of 'shortage of food' can be solved by the following methods:
 - (a) By using improved varieties of seed,
 - (b) By applying irrigation and fertilizer,
 - (c) By applying insecticides carefully,
 - (d) By using scientific methods in growing foodgrains,
 - (e) By undergoing multi-cropping.
- (v) I will make a group who want to help poor people. I will explain to the group that why lots of people go to bed without having food. On the otherhand, we waste lots of food. The group will identify the people whom the excess food can be distributed. The group will request the organizer of a feast to handover the excess food to them which will be distributed to the poor. We will display banners at public places to make aware the people about the existence of the group. An awareness drive should be done to educate people so that wastage of food become minimum.