#### Solution

### : WHY DO WE FALL ILL?

# Class 09 - Science

#### Section A

#### 1. (a) Iron

#### Explanation:

As iron is a micronutrient that is required mainly for enzyme activity and fertilisers are supplied mainly for replenishing macronutrients which help in plant growth.

2.

#### (c) intervarietal cross

#### **Explanation:**

When the crossing is done between different varieties of plants, it is called intervarietal. In this case, plants of the same species but from different populations are cross-bred to produce a new variety.

3.

(d) competing for various resources of crops (plants) causing low availability of nutrients **Explanation:** 

Unwanted plants which grow in the field are called weeds, e.g. Xanthium (gokhroo), Parthenium (gajar ghas), Cyperinus rotundus (motha). They compete with crops for various resources; like sunlight, water and nutrients. Thus, weeds hamper the growth of crops.

#### 4.

(d) Competing for various resources of crops (plants)

# Explanation:

The growth of weeds in the fields is harmful because they compete with other crops for nutrients, water, space, light. A **weed** is a plant considered undesirable in a particular situation, "a plant in the wrong place". A plant that is a weed in one context is not a weed when growing in a situation where it is in fact wanted, and where one species of plant is a valuable crop plant, another species in the same genus might be a serious weed. They compete with the desired plants for the resources that a plant typically needs, namely, direct sunlight, soil nutrients, water, and space for growth, providing hosts and vectors for plant pathogens giving them greater opportunity to infect and degrade the quality of the desired plants.

5.

# (b) vermicompost

## Explanation:

Vermicomposting involves degradation of organic matter into fertile manure by using special type of earthworms called as red worms. The nutrient rich manure is called as vermicompost. The process of preparing manure with the help of red worms is called vermicomposting. The red worm is a type of earthworm that lives in the soil rich in organic matter. Organic soils are rich in nitrogen and carbon with plenty of moisture and microbes.

6.

(c) Sahiwal

#### Explanation:

Jersey, Brown Swiss, Holstein-Friesian all are Exotic breeds of cow. Sahiwal, Gir, Red Sindhi, Tharparkar are Indigenous breeds and Karan Swiss, Karan Fries, Frieswal are Cross-breeds.

7.

(b) Fish Production **Explanation**:

As the blue revolution is the management of water resources that can steer humanity to achieve drinking water and crop irrigation security. It refers to all active culturing of aquatic animals and oceans scattered the light scattered by the atmosphere make earth prevailingly blue.

# 8. (a) High cost production

## **Explanation:**

High cost production

9.

# (b) All of these

# Explanation:

To solve the food problem of the country, the following is necessary

i. Increased production and storage of food grains.

- ii. Easy access of people to the food grain.
- iii. People should have money to purchase grains.

# 10.

(c) Smut of bajra

# **Explanation:**

Soil-borne disease are caused by fungal pathogens which persist (survive) in the soil matrix and in residues on the soil surface are defined as soil-borne diseases. Smut of bajra is a soil-borne disease.

# 11. (a) Iron

# Explanation:

Including milk in your daily diet enables you to increase your intake of calcium, which you need for your bones and teeth. While milk contains a trace amount of iron, it does not contain enough for it to be your only source of this nutrient in your diet.

# 12. (a) Iron, Copper, Manganese.

# Explanation:

As iron is required in very small quantity which is the main part of chlorophyll, copper activates some enzymes in plants and manganese is the second greatest micro-nutrient after iron which plays a significant role in photosynthesis.

## 13.

# (**d**) Sheep

# Explanation:

Draught animals are used in agriculture and transportation. Camel, elephant, and horse all are used for agriculture and transportation whereas sheep are not used for agriculture and transportation.

# 14.

#### (b) liver Explanation:

Cattle eat the vegetation and become infected. The fluke migrates to the liver, infects the bile duct and matures into an adult.

## 15.

(b) P and Q emerge from unfertilised eggs, while R emerges from fertilised eggs.

# Explanation:

In the given figures, P, Q and R represent worker bee, queen bee and drone bee present in a colony of honeybees. Drones(P) are produced by parthenogenesis, i.e., they emerge from unfertilised eggs whereas worker (P) and queen (Q) bees emerge from fertilised eggs.

## 16. (a) Fish

# **Explanation:**

Increase in the production of fish, shellfish, prawns, crabs, shrimps, etc., through culture fishery has brought a revolution. This revolution resulting in increased production of fish food is called blue revolution.

#### 17.

### (c) Dr.V. Kurein

## **Explanation:**

Dr.V. Kurein is called as the 'Father of white revolution' in India because of his initiatives and immense contribution to the dairy sector.

### 18.

(c) All of these

# Explanation:

Humans have been a powerful agent in modifying wild species to suit their own requirement throughout ages by using artificial selection. From wild cabbage many varieties like broccoli, cauliflower, red cabbage, kale, cabbage and kohlrabi were obtained.

# 19.

(c) June to October

# Explanation:

Kharif crops are the crops grown in rainy season extending from June to October hence are also called as monsoon crops. These crops are totally rain dependent crops. Kharif crops include paddy, soybean, sugarcane.

## 20.

# **(b)** (i), (ii) and (iii)

# Explanation:

The branch of agriculture that deals with feeding, caring, and breeding of domestic animals is called animal husbandry. In India cattle are next to land in use for farmers. Cattle husbandry is done for milk production, agricultural work, and meat production.

## 21.

(d) A is false but R is true.

## Explanation:

The grains should be cleaned before storage. They should be filled in new gunny bags before keeping in godowns, warehouses, or stores.

## 22.

(b) Both A and R are true but R is not the correct explanation of A.

# Explanation:

The process of supplying water to crop plants by means of canals, wells, reservoirs, tube-wells, etc. is known as irrigation. Most agriculture in India is rain-fed, that is, the success of crops in most areas is dependent on timely monsoons, and sufficient rainfall spread through most of the growing season.

## 23.

(c) A is true but R is false.

## **Explanation:**

Fungicides are chemicals which are effective against fungal pathogens. Fungicides are divided into two major types, inorganic and organic. Most inorganic fungicides are harmful to other living beings including humans.

# 24. (a) Both A and R are true and R is the correct explanation of A.

## Explanation:

Farm animals are given vaccinations to protect them from major viral and bacterial diseases, which can even cause death of animals.

## 25.

(c) A is true but R is false.Explanation:

Usage of manure is advantageous for our environment as manure contains large quantities of organic matter. It is prepared by the decomposition of animal excreta and plant wastes. It helps in enriching the soil with nutrients and organic matter, increasing soil fertility and its water holding capacity. Manure do not contain chemical substances. Fertilizers contain chemical substances like nitrogen, phosphorus, and potassium.

#### 26.

(c) A is true but R is false.

## Explanation:

During storage, grains and seeds are subjected to spoilage and wastage by various means. There are two factors that are responsible for such losses – biotic factors and abiotic factors.

Biotic factors include insects, rodents, birds, mites, and bacteria. Abiotic factors are inappropriate moisture, temperature, and humidity in the place of storage.

#### 27.

(b) Both A and R are true but R is not the correct explanation of A.

#### Explanation:

Nutrient management means controlling the selection, timing, and amount of nutrient supply to the crops. Like other living organisms, plants also require inorganic elements called nutrients. Nutrients are supplied to the plants by air, water, and soil.

28. (a) Both A and R are true and R is the correct explanation of A.

#### **Explanation:**

The growth of weeds in the crop fields is harmful because they compete for food, space, and light. They take up nutrients and reduce the growth of the crop.

29. (a) Both A and R are true and R is the correct explanation of A.

#### **Explanation:**

Fertilizers are commercially produced plant nutrient that enriches the soil fertility and increases the crop yield. They supply nitrogen, phosphorus, and potassium. They are used to ensure good vegetative growth (leaves, branches, and flowers), giving rise to healthy plants but they should be applied carefully in terms of proper dose, time, and observing pre-and post-application precautions for their complete utilization.

30. (a) Both A and R are true and R is the correct explanation of A.

## Explanation:

Fertilizers are inorganic or organic compounds containing one or more essential plant nutrients which are used for increasing the fertility of soil. They are manufactured commercially from chemicals and are marketed in concentrated form.

- 31. Rinderpest
- 32. Rice blast.
- 33. Sixteen.
- 34. To avoid over–crowding.
- 35. Nutrition deficiency.
- 36. Culture fishery is the type of fishery practised in small water bodies where fish is first reared and then harvested.
- 37. Grains of maize and oil cakes.
- 38. Production and more efficient management of milk.
- 39. Bee wax and royal jelly
- 40. Fertilizer is nutrient specific.

#### Section B

41. Plant breeding or hybridisation method which involves crossing two different plant varieties to obtain a new and better variety is called genetic manipulation.

In agricultural practices to reduce the application of insecticides and fungicides or even fertilizers such varieties are being prepared that are:

- high yielding
- pest resistant
- resistant to environmental stress

• don't need fertilizers for good growth

All these features help not only to improve quality and quantity of products but also reduces chances of environmental pollution.

42. Mixed cropping is employed to minimise risk and as an insurance against crop failure due to abnormal weather conditions. The main criteria's for selection of the crops for mixed cropping are as follows:

(a) Duration of Crops: One of the crops should be a long duration and other should be a short duration crop.

(b) Growth Habit: One of the crops should be growing tall and the other should be growing short. The component crops should

have different canopy (i.e., the structure of leaves, stem and flowers found above the ground).

- (c) Nutrient Demand: One of the component crops should require lesser nutrients than the other crop.
- (d) Root Pattern: One should be deep-rooted while the other should be shallow-rooted.
- (e) Water Requirement: One of the component crops should require lesser water than the other.
- 43. Insect pests damage / harm the plants in following ways
  - a) They cut root, stem and leaf.
  - b) They suck the cell sap from various plant parts.
  - c) They bore into stems and fruits.
  - d) They form galls.
  - e) They destroy stored grains.
- 44. The disease causing microorganisms like bacteria, fungi and viruses are called pathogens.
  - They reach the plants through water, air, soil as well as seeds.

Two plant diseases caused by pathogens are rust in wheat and blast in paddy/stem rot in pigeon pea.

- 45. The chemicals used are sprayed on the crop to prevent diseases which leads to environmental pollution. Some part gets penetrated in grains which gets introduced in the food chain and is harmful to animals and human beings.
- 46. a. **Shelter:** Both dairy, well-designed, airy and hygienic shelter.
  - b. Feeding: Healthy feed is provided to both dairy animals and poultry birds to get good yield.
  - c. Caring for animal health: Both animals and birds must be protected from various diseases.

47. Five methods by which we can increase the yield of crops and livestock are as follow:

- i. By including better crop management like mixed farming, crop and fodder yields can be improved.
- ii. By improved varieties of seeds etc. and cropping practices, we can improve the yield of crops which indirectly provides improved food for livestock.
- iii. By minimizing the application of fertilizers and pesticides.
- iv. By adopting integrated farming practices, e.g., combining agriculture with livestock.
- v. By promoting the usage of livestock excreta for production of compost, we can supply required nutrients through soil.
- 48. Conditions given in (c) will give the most benefits because:
  - a. Farmer will benefit by using quality seeds.
  - b. Proper irrigation will overcome drought or flood situations.
  - c. Fertilisers will provide nutrients and there will be higher yield.
    - For most benefits, every aspect of agriculture should be taken care of.
- 49. Compost: It is prepared by the process in which farm waste materials like livestock excreta, vegetable wastes, animal refuse, domestic waste, straw, eradicated weeds are decomposed and used as manure.

Vermicompost: It is the compost prepared from organic matter using earthworms which hasten the process of decomposition.

- 50. i. Manure is an organic substance obtained through the decomposition of plant wastes like straw and animal wastes such as cow dung. The decomposition is brought about by microbes.
  - ii. Advantages of using manure are:
    - a. It enriches the soil with nutrients without any pollution.
    - b. It improves soil texture.
    - c. It increases the water-holding capacity of soil by adding organic matter to it.
  - iii. Green manure is different as it is obtained by growing green plants, which are then mulched by ploughing them into the soil. Later on, it forms green manure.
- 51. Demerits: (i) Threat to biodiversity, (ii) only economically important and valued fishes will be cultured.

Merits: (i) Large amount of desired fishes can be obtained in small area,

(ii) improvement can be done.

- 52. Preventive measures and biological control methods are preferred because:
  - i. They are simple.

- ii. They are more economic.
- iii. They minimise pollution without affecting the soil quality.
- 53. Prevention is better than cure so is true for plants also. Such preventions involve spraying of herbicides, weedicides, insecticides, pesticides, fungicides etc in the crop field.

Since their excessive use can harm the crop plants and cause pollution so proper seed bed preparation, timely sowing of crops, intercropping and crop rotation are additionally applicable. Other than these biological control methods like use of resistant varieties is highly useful.

54. **Hybridization** - Hybridization refers to crossing between genetically dissimilar organisms to produce offsprings with a desirable combination of characters.

**Photoperiod** - Duration of sunlight available to the plant is called as photoperiod. It affects the growth, flowering, and maturation of crops.

55. Following are the main advantages of mixed farming:

(a) Farmyard manure is made available from livestock which is used again in agricultural farms.

(b) Organic waste material like straw, husks and chaffs of grains, household kitchen waste, etc., are converted into human food through the agency of cattle, sheep, poultry, pigs, etc., as per the choice of farmer.

(c) It provides work to all the members of a family throughout the year, thus providing subsidiary occupation without the need of employing special labour.

(d) Adopting exact combination in mixed farming, income can be increased, e.g., the number of animals can be increased (as per the food/crop available) to enhance milk production.

56. For better cropping in low rainfall areas, farmers can be suggested to:

a. Practice farming with drought-resistant and early maturing varieties of crops.

- b. To enrich the soil with more humus content as it increases the water-holding capacity and retains water for longer duration.
- 57. There are sixteen nutrients which are essential for plants. Amongst these nutrients, six are required in large quantities and are therefore called macronutrients.

Macronutrients: nitrogen, phosphorus, potassium, calcium, magnesium, sulphur.

- 58. There are two methods of obtaining fish, capture fishery (capturing fish) from natural waters and culture fishery in impounded waters. In both cases the fish are caught with the help of nets.
- 59. Organic matter is important for crop production because:
  - a. It helps in improving soil structure by improving the soil fertility.
  - b. It helps in increasing water holding capacity of sandy soil.
  - c. In clayey soil large quantities of organic matter helps in drainage and in avoiding waterlogging.

#### 60. Kharif Crops

- 1. The term 'Kharif' comes from Arabic language means autumn
- 2. The crops which are grown in the rainy season are called Kharif crops
- 3. Seeds are sown in the month of June/July
- 4. Harvested during the months of October/November
- 5. These crops are also known as monsoon crops
- 6. These crops depends on the quantity of rain water as well its timing
- 7. These crops can grow in hot and wet conditions
- 8. Examples of Kharif crops are paddy, maize, soyabean, groundnut, cotton etc.,

#### **Rabi Crops**

- 1. The term 'Rabi' comes from Arabic language means spring.
- 2. The crops which are grown in the winter season are called Rabi crops
- 3. Seeds are sown in the month of November/December
- 4. Harvested during the months of March/April
- 5. These crops are also known as winter crops
- 6. These crops mainly depends on the water that has percolated in the ground during rainy season
- 7. These crops grow in cold and dry conditions
- 8. Examples of Rabi crops are wheat, gram, pea, mustard, linseed etc.,

#### Section C

61. i. **Manure** is a kind of natural fertilizer formed from the decomposition of animal excreta and plant waste. It mainly contains organic matter and some nutrients in a small amount.

**Fertilizers** are chemicals manufactured in factories and are highly rich in nutrients like nitrogen, phosphorus and potassium. They provide a large number of nutrients and thus ensure better growth of plants.

- ii. Fertilizer
- iii. In Green manure nitrogen, phosphorous, and organic matter are present. The main purpose of using green manure in agriculture is to provide protection against soil erosion and leaching.
- iv. Manure has better water holding capacity by improving the soil structure.
- 62. i. The two types of fisheries depending upon the mode of obtaining fish are capture and culture fisheries.
  - ii. Omega 3 fatty acid is exclusively found in the fishes.
  - iii. Yes, Rohu is a bony fish. It can be used in fin fishery.
  - iv. The vitamins found in fish liver oil is Vitamin A and D.
- 63. i. Egg-laying poultry birds are called **layers.** 
  - ii. The specialized meat-producing poultry birds are called **broilers.**
  - iii. The tremendous rise in the availability of poultry products is called Silver Revolution.
  - iv. Following are the example of poultry birdsIndigenous breed: Assel and Kadaknath.Exotic breed: Rhode island red and Light Sussex.
- 64. i. The various cropping seasons in India are Rabi crop, Kharif crop and Zaid crop.
  - ii. Rabi crops are sown during the winter season which requires less water.
  - Kharif crop is sown during summer/rainy season which requires abundant water.
  - iii. Examples of Rabi crop- wheat, gram.
    - Examples of Kharif crop -paddy, soybean.
  - iv. There is a short season between Kharif and Rabi season in the months of March to July. The crops that grow in this season are Zaid crops. These crops are grown on irrigated lands and do not have to wait for monsoons. Some examples of Zaid types of crops are pumpkin, cucumber, bitter groud.
- 65. i. Animals that produce milk are called **milch animals** (the females of the herd).
  - ii. Animals that are used for carrying out agricultural work like tilling, carting etc. are called **draught animals** (males and the females that are poor in milk-yielding varieties).
  - iii. Cross-breeding helps in the development of certain desired characteristics in animals like,
    - a. Increased milk production,
    - b. Resistance against diseases.
    - c. Breeds that require less amount of quality feed.
  - iv. In order to obtain a good quality of milk from the cattle, it is important to manage shelter, food, breeding and disease control of cattle.

#### Section D

- 66. i. The availability moisture and irrigation facilities decide the chose the crop to be cultivated after one harvest and the process knows as crop rotation.
  - ii. Biological manure help in improving soil structure, enriching the soil with nutrient also reduce the risk of water pollution which is a major problem with chemical fertilizers.
  - iii. Yes, it is possible to grow two crops simultaneously at the same but the two crops are chosen to grow should have a different nutrient requirement.

OR

Biotic losses caused by - insects, rodents, fungi, mites, and bacteria and abiotic losses are inappropriate moisture and temperature in place of quality.

- 67. i. The various cropping seasons in India are Rabi crop, Kharif crop and Zaid crop.
  - ii. Rabi crops are sown during the winter season which requires less water. Kharif crop is sown during the summer/rainy season which requires abundant water.
  - iii. Farmers are suggested to grow drought-resistant crops that can mature early. Along with this farmers are advised to use manure for their fields as it increases the water-holding capacity of the soil.

OR

There is a short season between Kharif and Rabi season in the months of March to July. The crops that grow in this season are **Zaid crops**. These crops are grown on irrigated lands and do not have to wait for monsoons. Some examples of Zaid types of crops are pumpkin, cucumber, and bitter gourd.

- 68. i. Ramesh can use cross-breeding he can crossbreed his local breeds buffaloes with exotic or foreign bread who have long lactation period to increase the milk production.
  - ii. We will provide vaccination to our cattle against viral and bacterial disease in order to protect them.
  - iii. To maintain hygiene regular brushing of cattle to remove dirt and loose hair in addition to this the floor of cattle shed should be slopping to facilitate cleaning.

OR

Bos indicus and Bos bubalis.

- 69. i. Bees need quality nectar to produce honey. A good pasturage consists of plenty of flowers that can be used by bees to get quality nectar. This increase the quality as well as the quantity of the bees. If bees are confined to only a single variety of flowers for nectar honey quality will have a similar taste and consistency. Most farmers make honey obtained from single nectar.
  - ii. Yes, honey bee helps in pollination. The bright-coloured flowers attract the honey bee.
  - iii. Besides honey, other products of bee-keeping are bee wax, bee venom, propolis, and royal jelly.

## OR

Spring season is best to start a beehive.

- 70. i. The two types of fisheries depending upon the mode of obtaining fish are capture and culture fisheries.
  - ii. Omega 3 fatty acid is exclusively found in the fishes.
  - iii. Yes, Rohu is a bony fish. It can be used in fin fishery.

#### OR

Capture fishery is traditional fishing where a fisherman catches the fish from natural resources like the sea and rivers. A cultural fishery is one where the fish are obtained and reared for commercial purposes.

#### 71. i. Brown Swiss and Jersey

- ii. Frieswal and Karan-Swiss
- iii. Some factors governing the yield of milk are:
  - a. Number of milkings per day
  - b. Amount of milk at cach milking
  - c. Length of the lactation period

#### OR

Only when it is in heat.

- 72. i. Animals that produce milk are called **milch animals**. In India, buffaloes are the primary source of milk. Example Cows, goats, buffaloes.
  - ii. Animals that are used for carrying out agricultural work like tilling, carting etc. are called draught animals (males and females that are poor in milk-yielding varieties).
  - iii. Cross-breeding helps in the development of certain desired characteristics in animals like,
    - a. Increased milk production.
    - b. Resistance against diseases.
    - c. Breeds that require less amount of quality feed.

#### OR

In order to obtain good quality milk from the cattle, it is important to manage shelter, food, breeding, and disease control of cattle.

- 73. i. They take part in nuptial flight after which they but not allowed to enter the colony.
  - ii. During new colony formation and from unfertilized eggs.
  - iii. Bees produce food substances for worker bees and larvae in the form of bee bread.

## OR

Colony behavior, egg laying and ovary development in worker honey bees is prevented by queen pheromones and open brood pheromone. However, in the absence of these regulating pheromones, workers may develop ovaries which will enable them to lay their own eggs.

- 74. i. The most common source of irrigation is tube wells. Irrigation is the artificial process of applying controlled amounts of water to land to assist in the production of crops.
  - ii. The various sources of irrigation are canals, tanks, tube wells, other wells, and other sources like rainwater harvesting.
  - iii. The last source of irrigation tanks.
    - OR

The other sources include rainwater harvesting and watershed management.

- 75. i. Growing two or more crops in different strips in the same field is Inter-cropping.
  - ii. Intercropping is superior to all other means of cropping because
    - Better utilisation of minerals and water from different layers of soil.
    - Nonspread of weeds to whole cropping area.
    - Nonspread of pests to whole cropping area.
  - iii. Inter-cropping

OR

Monocropping