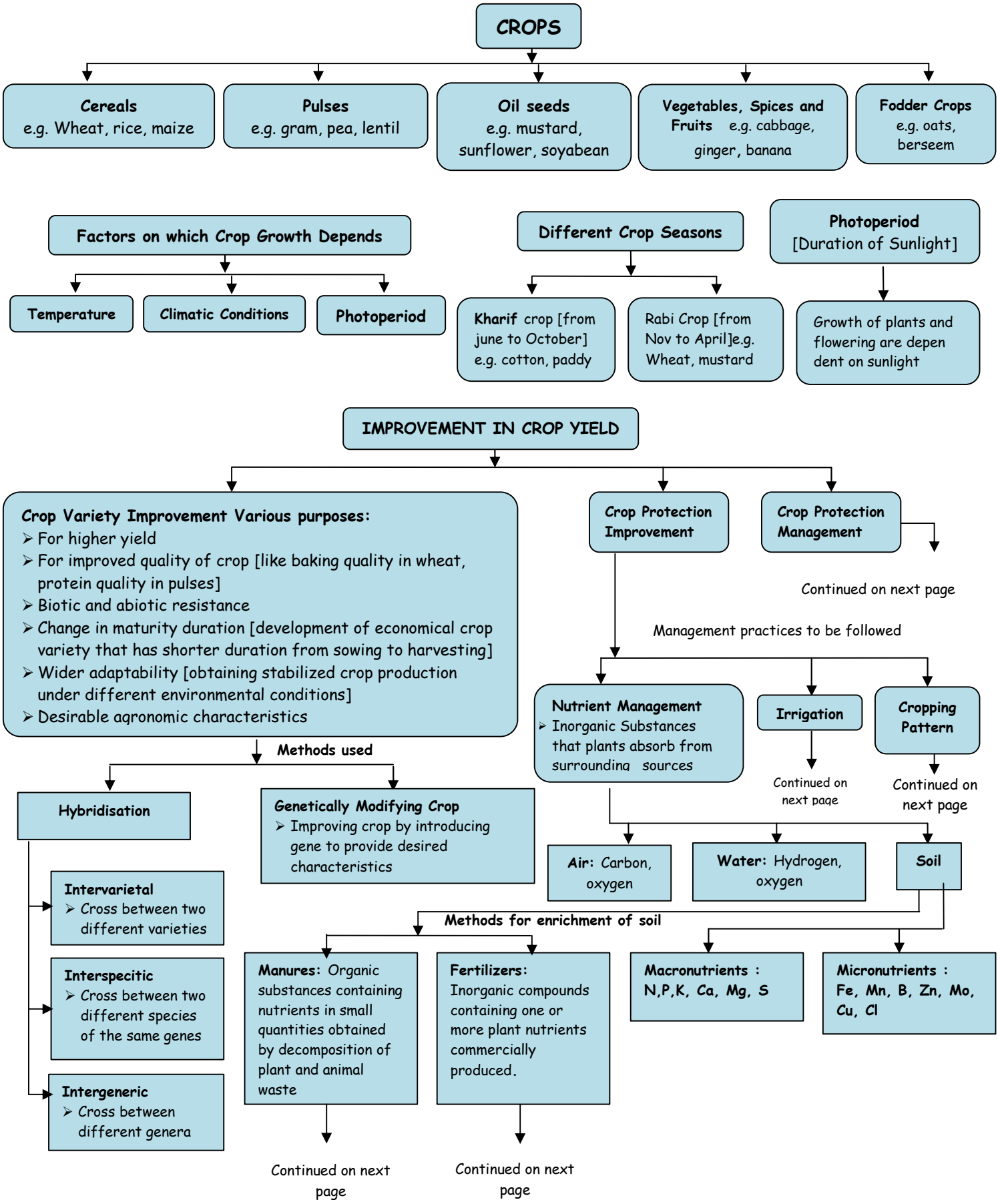
GRADE – 9

LESSON – 15 [IMPROVEMENT IN FOOD RESOURCES] (Chapter at a Glance)



Continued from previous page → **Types of Manures**

- **Farmyard Manure:** Decomposed mixture of cattle excreta, urine, water and fodder
- **Compost:** Decomposed mixture of livestock excreta, vegetable waste, animal refuse, domestic waste, straw, eradicated weeds, etc
- **Vermi - compost:** Compost is prepared by using earthworms to hasten the process of decomposition
- **Green Manure :** Before sowing crop seeds growing or ploughing and mixing of some green crops like sunn hemp with soil

Continued from previous page → **Types of Fertilizers**

- **Nitrogenous** e.g., Ammonium nitrate, urea
- **Phosphatic** e.g. Single superphosphate, Triple superphosphate
- **Potassic** e.g. Potassium Chloride, Potassium sulphate
- **Complex** e.g. Nitrophosphate Ammonium Phosphate

Organic Farming: Farming system with minimal or no use of chemicals (fertilizers, herbicides, pesticides etc. and with maximum input of organic manures, biofertilizers, biopesticides and healthy cropping systems.)

Continued from previous page → **Irrigation (Supplying water to crop plans)**

Irrigation System

- Wells
  - Dug Wells
  - Tube Wells
- Canals
- Tanks
- River Valley System
- River Lift System

Rainwater harvesting and water shed management: Done for increasing water availability for irrigation by increasing groundwater level

Continued from previous page → **Cropping Patterns** (for maximum benefit)

- **Mixed Cropping:** Practice of growing two or more crops simultaneously on the same piece of land. E.g. wheat + mustard. groundnut + sunflower, wheat + gram, soyabean + pigeon pea.
- **Intercropping:** Process of growing two or more crops simultaneously on the same field in a definite pattern e.g. bajra [finger millet] + lobia [cowpea], soyabean + maize
- **Crop Rotation**: Practice of growing different crops on a piece of land in a pre-planned succession.

Continued from previous page → **Crop Protection Management**

- Use of pesticides
  - Insecticides for killing the insects
  - Weedicides for killing the weeds
  - Fungicides for killing the fungus.
  - Nematicides for killing nematodes
  - Rodenticides for killing rodents.
- Use of resistant varieties
- Crop rotation and other cropping systems
- Summer ploughing

TYPE OF INSECTS THAT ATTACK THE PLANT

- **Chewing insects :** They cut and chew roots, stems and leaves, e.g. grasshopper
- **Sucking insects :** They suck the cell sap from different parts of the plants e.g.
- **Borer insects :** They bore and enter different plant parts and feed on plant tissue e.g. sugarcane borer

TYPE OF WEEDS

- Narrow lead weeds, e.g. wild sorghum
- Broad leaf weeds. E.g. Amaranthus viridis

WEED CONTROL

- **Mechanical methods :** Uprooting, hand hoeing, ploughing, burning and flooding.
- **Cultural methods :** Proper seed bed preparation timely sowing of crops, intercropping and crop rotation
- **Chemical methods :** Spraying chemicals like atrazine, isoproturon
- **Biological method :** Use of insects or organism which consume and destroy weed.

STORAGE OF GRAINS

- **Factors responsible for stored grains losses:**
  - **Biotic factors :** insects, rodents, birds, mites and bacteria
  - **Abiotic factors :** e.g. moisture content temperature and humidity
- **Preventive measures:**
  - **Drying**
  - **Maintenance of hygiene**
  - **Prophylactic treatment**
  - **Improved storage structures**
- **Control measures:**
  - Chemical control
  - Fumigation
  - Adding Plant Products, e.g. using neem kernel powder

ANIMAL HUSBANDRY

◈ Science of rearing, feeding , caring, breeding and utilisation of animals

Requirement for animal husbandry :

- Milk production
- Egg production
- Meat production
- Fish production
- Utilisation of animal waste for manure

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Cattle Farming
(cow, buffalo, goat, camel are reared for the following purpose)

- Milch animals (for milk production)
- Draught animals (for irrigation, transportation and land tilling

Fish Production

Methods used for obtaining fish:
- Capture fishing
- Culture fishery

Inland fisheries :
- Composite fish culture
- Sewage fed fish culture
- Paddy – cum - fish culture
- Integrated fish culture
- Fresh water pearl culture
- e.g. Rohu, catla , Mrigal

Marine fisheries :
e.g. pomphret, mackerel, tuna, sardines are popular marine fishes

Poultry Farming
(for egg production and chicken meat)

Indigenous breeds
e.g. Aseel breeds like peela

Exotic breeds
e.g. white leghorn, rhode island red

Cross breeds
e.g. HH 260, IBL – 80 and B - 77

Layers and Broilers
Layers : These are chickens raised to lay egg
Broilers : These are chickens raised for meat. These are given vitamin-rich supplementary feed for obtaining good growth rate and also better feed efficiency.

Poultry Diseases

Caused by

- Parasites e.g. worms, mites
- Virus e.g. fowl pox
- Bacteria e.g. tuberculosis
- Fungi e.g. aspergillosis
- Nutritional Deficiencies

Bee-keeping

For commercial honey production e.g. Apis cerana indica, Apis dorsata, Apis mellifera

BREEDS OF COW

- **Draught breeds**
- **Dairy breeds**
  - **Indigenous breed** e.g. Red Sindhi, Sahiwal, Gir
  - **Exotic breed** e.g. Jersey, Holstein Friesian and Brown - Swiss
  - **Improved breed** e.g. Karan Swiss, Karan Fries and Frieswal
- **Dual – purpose breeds**

ANIMAL FEED

Roughage
- Coarse and fibrous food with low - nutrition, e.g. green fodder, hay and

Concentrates
- rich in one or more nutrients e.g. Cotton seeds, oil seeds, oil cakes

PREVENTION AND CONTROL ANIMAL AND POULTRY DISEASES

- Maintaining proper Sanitation
- Regular cleaning of sheds
- Airy and ventilated shelters
- Disinfectant should be sprayed
- Vaccination at regular intervals

Objective Type Questions

I. Multiple choice questions

1. Green manure refers to

   a) the organic manure prepared by green worms

   b) the manure used by small green plants

   c) the plants grown and mulched by ploughing before sowing the crop

   d) the organic manure added to soil before ploughing and sowing.

2. Mixed cropping and intercropping involve growing of two or more crops simultaneously on the same field ; but the latter differs from the former in that

   a. it reduces risk and gives insurance against failure of crops.

   b. the different crops are grown in different rows alternating with each other

   c. cropping is practices along with rearing of animals

   d. crops are provided with only organic manures and bio fertilisers.

3. Plants can be made disease – resistant by

   a. hybridisation b. genetic modification

   c. both a and b c. use of antibiotics

4. Developing crop varieties with wider adaptability will help in stabilising crop production, because

   a. a single variety can be grown under different climatic conditions in different regions.

   b. that variety will have resistance to a wide variety of pests.

   c. that variety will be higher yielding than many other varieties

   d. that variety can be grown under same climatic conditions.

5. Induced breeding is used to increase the production of

   a. cows b. draught animals c. fish d. poultry birds

6. Determine the mineral nutrient/element whose loss is compensated by growing a pulse crop between two cereal crops

a. Calcium b. Sulphur c. Nitrogen d. Magnesium

7. Arrange the following animal food products which contain more fats, more proteins and least fat (among them) and choose the set that contains the right option in the above said order.

a) Fish, egg, meat b. Meat, milk, egg c. Milk, meat, fish d. Egg, meat fish

8. Application of nitrogenous fertilisers causes

a. Vigorous vegetative growth b. early flowering

c. related vegetative growth, but increased flowering

d. retarded flowering and resistance to worms

9. Inland fishery refers to

a. deep sea fisheries b. capturing fish from sea coast

c. culturing fish in freshwater bodies d. extraction of oil from fish

10. Identify the group containing only pulse crops

a. Pea, lentil, soya bean, green gram

b. Pigeon Pea, sunflower, mustard, black gram

c. Green gram, pigeon pea, wheat, sorghum d. Pea, lentil, sorghum, mustard

11. Kharif season extends from

a. January to March b. April to June

c. June to October d) October to January

12. The scientific name of the honeybee employed n the commercial production of honey, is

a. Apis florae b. Apis mellifera c. Apis dorsata d. Apis indica

13. Obtaining fish from natural water resources is known

a. culture fishery b. fish farming

c. capture fishing d. fresh water fishery

14. Catlas feed on the _____of the water body.

a. surface b. grasses / weeds c. bottom zone d. middle zone

15. Intervarietal cross means the cross between two different

a. species of the same genus b. varieties of the same species

c. species with similarly traits d. varieties with similar traits

16. The process of crossing genetically dissimilar plants of a species, is called

a) intervarietal cross b) interspecific cross

c) intergeneric cross d) all of these

17. Bee pasturage refers to

a) the trees where bees make the hives

b) the flowers available for nectar collection by the bees

c) the hives where honey bees live and deposit honey

d) the worker bees in a hive, who collect honey

18. The system of culturing five or six species of fish with different food habits, in a fishpond is called

a) mariculture b) composite fish culture

c) capture fishing d) pisciculture

19. Manures are used in sandy soils mainly to

a) provide all essential nutrients to crops b) increase the water holding capacity

c) avoid water logging d) reduce soil pollution

20. Continuous use of fertilizers can destroy soil fertility because

a) organic matter is not replenished b) microbes in the soil are harmed

c) soil becomes hard d) both (a) and (b)

21. Which one is an oil yielding plant among the following [NCERT Explore Problem]

a. Lentil b. sunflower c. Cauliflower d. Hibiscus

22. Which one is not a source of carbohydrate?

a. Rice b. Millets c. Sorghum d. Gram

23. Find out the wrong statement from the following [NCERT Exemplar Problem]

a. White revolution is meant for increase in milk production

b. Blue revolution is meant for increase in fish production

c. Increasing food production without compromising with environmental quality is called as sustainable agriculture

d. None of the above

24. To solve the food problem of the country, which among the following is necessary [NCERT Exemplar Problem]

a. Increased production and storage of food grains

b. Easy access of people to the food grain

c. People should have money to purchase the grains

d. All of the above

25. Find out the correct sentence [NCERT Exemplar Problem]

i) Hybridisation means crossing between genetically dissimilar plants

ii) Cross between two varieties is called as inter specific hybridization

iii) Introducing genes of desired character into a plant gives genetically modified crop

iv) Cross between plants of two species is called as inter varietal hybridization

(a) i and iii (b) ii and iv (c) ii and iii (d) iii and iv

26. Weeds affect the crop plants by [NCERT Exemplar Problem]

a. Killing of plants in field before they grow

b. dominating the plants to grow

c. Competing for various resources of crops (plants) causing low availability of nutrients

d. all of the above

27. Which one of the following species of honeybee is an Italian species? [NCERT Exemplar Problem]

a. Apis dorsata b. Apis florae

c. Apis cerana indica d. Apis mellifera

28. Find out the correct sentence about manure [NCERT Exemplar Problem]

i. Manure contains large quantities of organic matter and small quantities of nutrients

ii. It increases the water holding capacity of sandy soil

iii. it helps in draining out of excess of water from clayey soil.

iv. its excessive use pollutes environment because it is made of animal excretory waste

(a) i and iii (b) i and ii (c) ii and iii (d) iii and iv

29. Cattle husbandry is done for the following [NCERT Exemplar Problem]

i. Milk production ii. Agricultural work

iii. Meat production iv. Egg production

(a) i ii and iii (b) ii, iii and iv (c) iii and iv (d) i and iv

30. Which of the following are Indian cattle? [NCERT Exemplar Problem]

i. Bos indicus ii. Bos domestica iii. Bos bubalis iv. Bos vulgaris

(a) i and iii (b) i and ii (c) ii and iii (d) iii and iv

1. c	2. b	3. c	4. a	5. c	6. c	7. d	8. a	9. c	10. a
11. c	12. b	13. c	14. a	15. b	16. a	17. b	18. b	19. b	20. d
21. b	22. d	23. d	24. d	25. a	26. c	27. d	28. b	29. a	30. a

31.

I. Match the following

Column I	Column II
1. Mrigal	A. Micronutrient
2. Rabi crop	B. Biopesticide
3. Broiler	C. Macronutrient
4. Magnesium	D. Biofertiliser
5. Manganese	E. Chicks for meat
6. Neem	F. Bottom feeder
	G. Winter season

1. F	2. G	3. E	4. C	5. A	6. B

I. Fill in the blanks

32. _____ are related to the duration of sunlight.

Photoperiods

33. The compost prepared with the help of earthworm is called _____

Vermicompost

34. _____ system of irrigation is practiced in areas closer to rivers

River lift

35. _____ of cattle feed contains high level of protein

Concentrate

I. True or False

36. Intergeneric hybridization involves crossing of plants belonging to two different species of one genus

37. Tallness and profuse branching are the desired agronomic traits in fodder crops

38. Paddy is an example of Rabi crop

39. Aspergillus is a fungus which affects stored food grains

40. Covered smut is a fungal disease of wheat crop

36. False	37. True	38. False	39. True	40. False

Directions (Q.41 to Q-43) : In the following Questions, the Assertion and Reason have been put forward.

Read the statements carefully and choose the correct alternative from the following

a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion

b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion

c) Assertion is true but the Reason is false

d) The statement of the Assertion is false but the Reason is true.

41. **Assertion :** We get carbohydrates from wheat, rice, maize, millets, sorghum etc

Reason : We get energy requirements of our body from carbohydrates

a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion

42. Assertion : Shorter the duration of crop from sowing to harvesting, more economical is the variety

Reason : Short duration allows farmers to grow multiple rounds of crop in a year

a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion

43. **Assertion :** Tallness and profuse branching are desirable characters for cereals

Reason : Crop varieties with wider adaptability will stabilize crop production under different environmental condition.

d) The statement of the Assertion is false but the Reason is true.

44. What is the advantage of selecting seeds of crops with wider adaptability for agriculture?

If seeds with wider adaptability are sown then there will be less damage of crop and the crop produced will be of good quality and quantity

45. Improved verities can be produced in both animals and plants. How?

Improved verities can be produced in both animals and plants b the processes of genetic manipulation and hybridisation.

46. Mention any two abiotic factors that affect crop production.

Abiotic factors such as temperature, wind, rain etc. affect the crop production

47. Name a farming system with minimal or no use of chemical fertilizers

Organic farming

48. Name two fodder crops

Berseem and Sudan grass are examples of fodder crop

49. Which crop is generally grown between two cereal crops to restore the fertility of soil?

Leguminous crop

50. Name a chemical fertiliser which can supply potassium as well as nitrogen

NPK (Nitrogen – Phosphorus – Potassium)

51. Name any two common weeds that grow with wheat and paddy

Wheat – Amaranthus and Paddy – Barnyard grass

52. Which one of the following is not a part of the biotic environment?

Man, Air, Trees, Insects

Air

53. Name any two storage pests of food grains commonly found in India

Rice weevil and Khapra beetle

54. How is the system of water – storage tanks used for irrigation purposes?

Tanks are small storage reservoirs which store the run-off of rain water. These tanks thus act as a small local source of water supply.

55. Write the name of an external source for the replenishment of the nutrients in the soil.

Manures or fertilizers

56. Name two plants which is used as biopesticide in organic forming

Turmeric and neem leaves are used as biopesticides in organic farming

56. Name two plants which is used as biospesticide in organic forming

Turmeric and neem leaves are used as biospesticides in organic farming

57. Name two fungal diseases of wheat crop.

i) Brown rust ii) Covered smut

58. Name one fungus which affects stored food grain

Aspergillus

59. What do you call growing of two or more different crops together in the same field?

Mixed cropping

60. What kinds of crops are grown in intercropping?

All the crop combinations grown in mixed cropping can also be grown in intercropping.

Ex: Soyabean + maize, Bajra + lobia etc.,

61. Why should we adopt crop rotation?

The soil nutrients taken up by one crop are replenished by the rotation of crops

62. Why are legumes desirable in crop rotation?

The legumes can fix the atmospheric nitrogen into the soil in the form of nitrates. Thus, legumes can replenish the nitrogen deficient in the soil.

63. Name the type of nutrient that we get from mustard seeds and linseed.

Fat is the nutrient that we get from mustard seeds and linseed.

64. What does the number 1: 2 mean in intercropping?

1 : 2 means land equivalent ration (LER). It is the ratio of the area under the main crop to the area under the main crop to the area under the intercrop.

1 : 2 refers to the row pattern with one row of the main crop and two rows of the intercrop

65. What will happened if both the crops in mixed cropping are similar?

If both the crops in mixed cropping are of the same kind, they will compete for basic needs such as sunlight, nutrients, water etc. As a result, both the crops will suffer in crop – yield.

66. Name two techniques which help in achieving the sustainability in agriculture.

Mixed farming, using improved varieties of crops and crop rotation.

67. What nutrient we mainly get from vegetables, spices and fruit crops?

We gat vitamins, minerals along with small quantities of protein, carbohydrate and oil from vegetables, spices and fruit.

68. Name two protein containing Rabi crops.

Pulses, cereals and gram are protein containing Rabi crops. (any two)

69. What agronomic conditions affect cultivation practices and crop yield?

Weather, soil quality and availability of water resources are agronomic conditions, which affect cultivation practices and crop yield

70. What is the basic objective in mixed cropping?

The basic objective in mixed cropping is that it reduces risk of total crop failure and gives some insurance against failure of one of the crops.

71. Differentiate milch breeds and draught breeds of cattle.

Milch breeds are breed for milk production while draught breeds are used in agricultural operations.

72. What is the importance of a good feed they become more healthier and they lay more eggs.

When poultry birds are given good feed they become more healthier and they lay more eggs.

73. Give one example each of roughage and concentrate of cattle.

Roughage –fodder concentrate cereal grains

74. How does cattle feed affect the milk yield?

Good feed maintains good health and increases milk yield of the cattle.

75. What is the significance of proper shelter of the animals?

Proper shelter helps in protecting animals from heat, cold, rain and predators.

76. Name (i) a viral disease of cattle, (ii) a bacterial disease of cattle.

i) Food –and-mouth disease – viral disease

ii) Anthrax – bacterial disease.

77. Name two indigenous breeds of fowls in India.

Aseel and Basara

78. Jersey and Sahiwal are high milk-yielding reeds of an animal. Name another high milk-yielding breed of this animal.

Cow-Holstein-Friesian

79. In what respect does the roughage differ from concentrates with reference to cattle feed?

Roughage includes straw and cellulose, while concentrates are oil cake, oil seeds rich in fat, proteins, minerals and vitamins in cattle feed.

80. Name the breed of buffalo, which yields more milk than the best indigenous breeds.

Murrah breed has more milk production

81. Name two high milk-yielding breeds of cow.

HYV of Cow: Jersey and Karan Fries

82. How are the cross-breeds of indigenous dairy cows developed?

Cross breeds are developed by mating the bulls of exotic breeds and cows of our indigenous breeds.

83. Name the two vitamins which are added in the poultry freed.

Vitamin A and K are added in poultry feed

84. How can we raise the food production from animals?

By developing new breeds with the desired characteristics, viz., high milk yielding cows, fast growing and more egg producing birds

85. How can we improve the desired characteristics of animals?

It can be done by selective breeding. It is done by cross-mating between two different breeds each having some desire characteristics

86. What importance does food supply gives to living organisms?

Living organisms get proteins, carbohydrates fats, vitamins and minerals from food.

87. What is the contribution of Green Revolution?

Green Revolution contributed in increasing food grain production.

88. What is White Revolution?

White Revolution led to easy availability of milk and hygienic pasteurised milk distribution.

89. Name two factors on which food security depends.

Food security depends – on – (i) availability of food and (ii) access to food

90. Name two external observations based on which one can infer an animal as healthy.

A healthy animal feeds normally and has a normal posture.

91. Name any two animal products which provide us vitamin D

Cow's milk, egg and fish

92. Provide some measure to increase yield of crop and livestock.

Some measure to increase yield of crop and livestock are:

i) variety improvement ii) Production improvement, and

iii) protection management (any two)

93. How can introduction of genes improve quality of crop?

Introduction of gene containing desired characteristics imparts the desired characters such as high yield, product quality, disease resistance etc.

94. Name the major nutrient which we get from fish.

Fish is the excellent source of high quality proteins with sufficient amount of all the essential amino acids

95. How does Catla differ from mrigal

Catla belongs to genus Catla, while mrigal belongs to genus Cirrhinus.

96. What is mariculture?

Mariculture is the cultivation of fish or other aquatic plants and animals for food and other purposes.

97. What is fumigation?

Fumigation is a preventive process to save grains during storage. In this method, fumes with chemical are used to protect the grains from attack of pests.

98. What the floor of the cattle shed needs to be sloping?

The floor of the cattle shed needs to be sloping so that it remains dry and it also helps in cleaning.

99. Why are Kharif crops more susceptible to infestation than the rabi crops

Kharif crops are more susceptible to infestation by pests because the humid and warm conditions at the time of growth (June to October) are favourable for infestation.

100. Name two common weeds which are generally found in wheat field.

Amaranthus and wild oat are common weeds found in wheat field.

101. What are the various factors which lead to spoilage of the stored food grains?

The various factors which lead to spoilage of good grains are:

i) Biotic factors e.g. insects rodents, birds etc.

ii) Abiotic factors e.g. moisture content temperature, etc.

102. How is green manure different from ordinary manure?

Ordinary manure is obtained by decomposing plant and animal waste. Green manure is obtained by growing green plants which are then mulched by ploughing

103. Give an advantage of apiculture

Advantages of apiculture are:

i) It increased the crop yield as bees act as good pollinators

ii) One can use the honey and wax from the honey combs to make natural products.

104. Give one example each of local variety and foreign variety of bee.

Local variety : Apis cerana indica

Foreign variety : A mellifera

105. State one factor which affects the quality of honey produced.

The quality of honey produced depends upon the flowers available to the bees for nector or pollen collection.

106. How can the rainwater be effectively used for irrigation purposes?

Major part of rainwater runs off to the sea. If this water is collected in storage reservoirs, tanks and inter-basin transfers, we can use this water for irrigation purposes during dry season.

107. Define biotic factor

The living components of an ecosystem are called the biotic factors.

108. What do you mean by vermicompost?

The compost which is prepared by farm wastes like vegetable waste, animal refuse, domestic waste, se significance of animal husbandry wage waste, eradicated weed etc by using earthworms to hasten the process of decomposition is known as vermicompost.

109. What is the significance of animal husbandry?

Significance of animal husbandry are

i) It helps to undertake proper management of domestic animals

ii) It helps to produce good quality, high yielding breeds of domestic animals

iii) It improves income of farmers

iv) It enriches soil with animal waster hat is used as manure

110. Name the categories in which animals are divided into according to their usefulness to human.

We obtain animal food mainly from :

i) Milk – yielding or milch animals

ii) Egg-laying birds

iii) Meet providing animals

111. What factors does the food requirement of dairy animals depend on?

Or

State the food requirements of dairy animals

The food requirement of dairy animals is of dependent on :

a) Maintenance requirement: The food required during lactation period in order to produce more milk.

112. Name any two Indian breeds of buffalo.

Indian breeds of buffalo are Murrah and Mehsana

113. Give two examples of shellfishes

Shellfish include two groups : Crustaceans and Molluscs (or molluscs)

Crustaceans include crabs and lobsters.

Molluscs include octopus and oysters

114. Mention the names of four marine fish of high economic value.

The four marine fishes are as follows :

Catla, Rohu, Common Carps and Mrigals.

I. Short answer questions

115. Explain intensive fish farming with the help of one example

Composite fish culture system us a way of intensive fish farming where five or six different species of fishes are grown in the same pond. Those fishes are taken that have different food habits and which do not compete with each other for food.

e.g. Catla, Rohu, Mrigal, Common Carp, Grass Carp are all cultivated in the same pond. Catla fish feeds on water surface, Rohu are middle –zone feeders Mrigal and Common Carp are bottom feeders while Grass Carp feed on weeds. Thus all the types of fishes live peacefully and proper utilization of food resources is taken care of which also increases the fish yield.

116. a) Define weed. Give two examples

b) Why is it essential to remove weeds from agricultural fields?

c) What are weedicides?

a) Weeds are small sized unwanted plants which grow along with a cultivated crop in the field. E.g. Xanthium, Parthenium etc.

b) It is essential to remove the weeds from the agricultural field as they can severely reduce the crop yield by competing for light, water and nutrients.

c) Weedicides are chemicals which are sprayed in the field to kill the weeds. E.g. atrazine, isoproturon etc.

117. In the summer vacation the students of IX standard were given an investigator project. They were asked to visit a diary farm and note down their observations. Vinay took information from the internet and made the project while Sakshi visited the dairy saw how and what cattle are fed with, how much milk they give per day . She also learned about the diseases they suffer from and how they are cleaned and taken care of.

i) What kind of feed is given to cattle to increase the milk production?

ii) Write down two symptoms of a sick animal

iii) Why and whose characteristics would you like to adopt between Sakshi and Vinay?

i) Concentrates which are low in fibre but contains high levels of proteins and other nutrients are required as feed for cattle to increase milk production.

ii) Symptoms of sick animals are :

a) They do not feed normally

b) They do not have normal posture

c) I will like to adopt the characteristics of Sakshi. One cannot learn and experience the feeling of field trip simply by browsing the internet. Method adopted by Vinay if continued by him may affect the character of Vinay when he grows. One must be honest with his word as these practices give birth to a person of strong character.

118. Explain the ways by which crop-production can be increased

Crop production can be increased by adopting suitable practices in farming and are divided into 3 major groups of activities:

i) Crop variety improvement

ii) Crop production improvement

iii) Crop protection improvement

i) Crop variety improvement : This approach depends on the finding of a crop variety that can give a good yield. Varieties of crop can be selected by breeding for various useful characteristics such a disease resistance, response to fertilizer, product quality and high yield. One way of incorporating desired characters is hybridization. Another way of improving he crop is by introducing gene that would provide the desired characters is hybridization. Another way of improving the crop is by introducing gene that would provide the desire character.

ii) Crop production improvement: It depends on the financial condition of the farmer. Crop production is of 3 types viz. low cost, high cost and no cost production. Use of manures and fertilizers, mixed cropping, intercropping, crop rotation are some crop production practices available for crop production

iii) Crop protecting management: Crops in the field must be protected from weeds, pests and diseases. All these cause damage to the crop.

Crop can be protected by :

a) Use of pesticide

b) Use of resistant varieties

c) Crop rotation and other cropping systems

d) Summer ploughing

119. Rahul and Rachna were practicing floriculture in their farm. They sold the flowers to florists in India. They felt that if they start bee-keeping too, their income will increase. They obtained more information from the local officer.

i) What is pasturage and how is it related to quality of honey

ii) Name a bee variety which is commonly used for commercial honey production.

iii) Why society would appreciate Rahul and Rachna?

i) Pasturage is the flowers available to the bees for nectar and pollen collection. The taste and quality of honey depends on the kind of flowers available in the pasturage.

ii) Apis cerana indica commonly known as Indian bee is used for commercial honey production.

iii) Rahul and Rachna have shown how to generate additional income without additional investment. This will be an eye opener for the youth of the society.

120. Name the environmental factors related to cultivation practices and crops yield. Explain how they are related to crop yield.

Different crop require different climatic conditions, temperature and photoperiods for their growth and completion of life cycle.

Photoperiods are related to the duration of sunlight . Growth of plants and flowering are dependent on sunlight. There are some crops which are grown in rainy season. There are some other crops which are grown in winter season. Thus environmental factors are related to collective practices and crop yield.

121. India is a country with three fourth of the population engaged in agriculture. Even though financial conditions of some farmers do allow them to take higher level farming practices and improved agriculture technology, yet they are hesitant to use of HYV seeds with traits such as resistance to diseases and pests, high quality that would finally result in higher yield. The Government's Kisan channel solved all their apprehensions.

i) What is meant by genetically modified crops?

ii) What are the desired agronomic characters for fodder and cereal crops?

iii) In your opinion, what should be done so that the modern agriculture technology is adopted by most of the farmers?

i) Genetically modified crops are those plants in which the DNA have been modified using genetic engineering techniques

ii) For fodder – profuse branching, and for cereal – dwarfness.

iii) Modern agriculture technology will be adopted by the farmers, the farmers have scientific temper, and they are made aware and given the knowledge to enhance agriculture practices.

122. Give one word for the following and give one example of each:

a) Growing one row of crop alternately with the other crop

b) Growing two or more crops simultaneously in the same field.

c) Growing of different crops on a land in pre-planned succession

i) Intercropping, e.g. Soyabean + Maize

ii) Mixed cropping e.g. wheat + gram

iii) Crop rotation, e.g. potato, oats, peas and rye.

123. Define animal husbandry. Why live stock production needs to be improved?

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

As the population increases, the living standard also increase, the demand for milk, egg and meat also increases. This growing need has made it necessary for human to improve the livestock production so that the requirements are met sufficiently.

124. Mention the three preventive and control measures used before storage of grains

The factors responsible for storage losses in agricultural produce are mainly of two types

i) Biotic factors such as insects rodents birds, mites and bacteria.

ii) Abiotic factors such as moisture content temperature and humidity.

Preventing measures

i) Drying

ii) Maintenance of hygiene

iii) Prophylactic treatment

iv) Improved storage structures

Control measures :

i) **Chemical control :** Spraying of chemicals like insecticides by mechanical sprayer.

ii) **Fumigation** : e.g. Insecticide solution is converted into fumes to kill the insects.

iii) Plant products : Vegetable or mineral oil are used in small quantity to protect the grains from insects and pests. Neem kernal powder, crushed dried fruit of black pepper or cloves are also used for controlling insects.

125. State three methods by which you can control growth of weeds in agricultural fields

Various methods o control weeds are :

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

b**) Cultural method** : Proper seed bed is prepared, seed is sown timely, and intercropping and crop rotation are 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 weeds e.g. Opuntia can be controlled by Cochineal insect and aquatic weeds by carp fish (any three)

126. Define crop rotation. While choosing plants for crop rotation, what factors should be kept in mind?

Crop Rotation is defined as the practice of growing different crops on a piece of land in a pre-planned succession/pattern

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.

Availability of moisture and irrigation facility should be kept in mind in choosing plants for crop rotation.

127. List any three management practices to be considered while designing a shelter for cattle.

Management practices to be considered in designing shelter for cattle are :

i) The shelter should be well ventilated

ii) The shelter should protect the cattle from rain, cold and heat

iii) The floor of the shed needs to be sloping so as to stay dry.

128. A farmer is advised to use manure instead of fertilizer in his fields. List any two advantages that the farmer will get if he accepts this advise. How is use of manure particularly useful for clayey and sandy soil?

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

Manure increases the water holding capacity in sandy soil. In clayey soil, large quantity of organic matter helps in drainage and avoids water logging.

129. Mention three different ways in which crop plants can be attacked by insect pests. Also suggest one control measure and two preventive measures against pests.

Three different ways in which crop can be attacked by insect pests are.

Chewing : Here, pests cut and chew roots, stems and leaves of the plants with the help of their chewing type mouth parts, e.g. grasshopper, locust

Sucking : In this method. Pests suck the cell sap from different parts of the plants with the help of their piercing and sucking mouth parts, e.g. aphids, leafhopper.

Boring : Insects bore and enter different plant parts and feed on the plant tissues e.g. sugarcane borer, cotton ball weevils.

Control measure : Spraying insecticide

Preventive measure : Use of resistant variety of seeds.

130. What are weeds? Give two examples. Mention any two methods of preventing the growth of weeds.

Weeds are the small-sized unwanted plants which grow along with a cultivated crop in a field. Control of weeds is economically very important as they can severely reduce crop yields by competing for light, water and nutrients with the main crop e.g. wild oats, Amaranthus viridis.

The preventive methods for weed control :

Preventive methods adopted for weed control are proper seed bed preparation, timely sowing of crops, intercropping and crop rotation

131. State three Preventive and Control Measures taken for storage of agricultural produce.

Preventive and Control Measures against Pests attacking Stored Grains : The grains which are meant for human or animal consumption, should be exposed to sun or fumigated

The various control measures are :

i**) Chemical Control :** Insecticides can be applied by spraying over the gunny bags containing food grains by a manual or mechanical sprayer.

ii) Fumigation : In this method, the insecticide solution is converted into fumes to kill the insects. These insecticides a are called fumigants. Fumigants occur in three states – Solid, liquid and gaseous.

iii) Plant Products : The practice of adding small quantity of vegetable oil or mineral oil to grains or legumes to protect them from insect pests and mixing of neem kernel powder, crushed dried fruit of black pepper or cloves is also effective in controlling insects.

132. What is hybridisation? What are its types?

Hybridisation refers to crossing between genetically dissimilar plants.

Hybridisation may be of three types.

i) **Intervarietal :** i.e. cross-breeding between two different varieties.

ii) **Interspecific** : i.e., cross-breeding between two different species of the same genus

iii) **Intergeneric :** i.e. cross – breeding between two different genera.

133. What are the advantages of inter-cropping? Explain giving one example

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 in the field. In this way, both crops can give better return

iii) Soil erosion is effectively arrested

iv) It helps to maintain soil fertility.

Example : Soyabean + maize or finger millet (bajra) + cowpea(lobia)

134. What is mixed farming ? How does it help a farmer?

Mixed cropping is the practice of growing two or more crops simultaneously on the same piece of land. Some mixed cropping practices are :

i) Soyabean + Pigeon pea ii) Wheat + Mustard

Advantages of Mixed Cropping :

i) The risk of total crop failure due to uncertain monsoon is reduced

ii) Farmers tend to harvest a variety of produce such as cereal, pulses or vegetables or fodder to meet the various requirements of family or of an agricultural farm.

135. Why has improving crop yields become important these days? List the major groups of activities for improving crop yield. Which one of these activities for improving crop yield. Which one of these activities is most important and why?

India is a very populous country and its population is still growing . Requirement of food is also increasing every year to feed this growing population. Additional farming land is not available for the country to increase production. It is therefore necessary to increases crop yield to meet the growing demand for food. The major groups of activities for improving crop yield are :

i) Crop variety improvement

ii) Crop production improvement

iii) Crop protection management

Out of the above three activities, crop variety improvement is most important. Yield of crop cannot be improved by production improvement and protection management unless the variety of crop is not good.

136. Discuss the role of any three biotic factors responsible for damaging food grains during storage

Biotic factors responsible for damaging food grains during storage are as follows.

i) Enzymes : Food material contain enzymes which spoil the food by their action. They are active at high temperature. Meat, fruits, fish vegetables, etc, should be stored at low temperature so that the enzymes may remain inactive.

ii) Microbes : Microorganisms like bacteria, moulds grow in stored food if the moisture content is high and at high temperature. They spoil the food forming toxic substances.

iii) Insects : Insects like weevil, grain borer, khapra beetle, etc. Infect the food grains on storage at high temperature and water content more than 14%. They spoil grains in different ways producing toxic substances as well as forming cocoon, laying eggs and damaging nutrient content.

137. Name the abiotic factors responsible for the damage of foodgrains during storage. How do they cause this damage?

The abiotic factors responsible for the damage of foodgrains during storage are :

i) Moisutre : Moisture content more than 14% makes the microbes to attack and insects to infest the grains. Safe storage is possible at less humid places.

ii) Temperature : Rise of room temperature of storage at higher temperature increases the chances of insect infestation. It also accelerates the growth of microorganisms like bacteria and fungi

138. How can we meet the future food needs?

We can meet the future food needs by:

i) Practicing mixed cropping ii) Practicing crop rotation

iii) using HYV if crops

(iv) proper management and use of land under cultivation.

(v) using natural and man-made resources judiciously.

139. a) Besides causing ill health and death, how do diseases affect the dairy animals?

b) In a cattle farm there are fifteen cattles. How can you differentiate between diseased and healthy cattles without conducting diagnostic tests?

c) Cattle feed should include right amount of concentrates. What do concentrates in cattle feed refer to ?

a) Besides causing ill health and death, diseases affect quality of milk and egg. It also decreases production of egg, milk and meat.

b) Diseased animals can be differentiated from the healthy animals by observing their behaviour, food consumption, excreta and milk production.

c) Concentrates have low fibre content but they contain relatively high levels of proteins and other nutrients.

140. Name two Indian breeds of cow. Mention two types of food requirements of milch animals

Two Indian breeds of cow are :

i) Red Sindhi – medium sized cows with red colour

ii) Sahiwal – large sized and heavier built animals.

Food Requirements of milch animals : These are of two types

i) Maintenance requirement – Food required to support the animal to live a healthy life.

ii) Milk producing requirement – It is the type of food given during the lactation period to increase milk production.

141) What is the basis of classifying manure? What are vermicompost and green manure? Name the nutrients which are supplied by green manure to the soil

Manures are classified based on the kind of biological material used. They are classified as : compost, vermicompost and green manure

Compost : It is prepared by the decomposition of waste materials in a pit. The waste materials include livestock excreta (e.g. cow dung) vegetable waste, domestic waster, straw, etc.

Vermicompost : When compost is prepared by using earthworms t o hasten the process of decomposition of plants and animal refuse. Here, the earthworm help to breakdown the wastes. This activity along with the excreta of the worms make the compost rich in nutrients.

Green Manure : This practice includes growing, ploughing and mixing of green crops (like sunn hemp) with soil to improve its physical structure and increase soil fertility. Green manure supplies nitrogen and phosphorus to the soil.

142) a. Give an example for exotic and indigenous breeds of the following :

Poultry, milk cattle

b) Name two shell fish

a) Poultry : Exotic breed – White leghorn ; Indigenous breed – Assel

Milk cattle : Exotic breed – Brown Swiss ; Indigenous breed – Red Sindhi.

b) Two shell fish are prawns and mussels.

143) Explain the different factors that are to be considered before deciding the nature of feed for cattle and poultry birds.

The food requirements of cattle and poultry birds vary according to the age, health, nature of work and special conditions like lactation period, etc.

Cattle Feed:

A calf needs more food and nutrition than an old cow.

The optimal food requirements of a cattle can be worked out by studying the internal structure, functioning of the rumen and nutritional quality of their feeds and fodder. The milk yield of an animal is largely determined by the kind of feed given to it.

Poultry feed :

The feed of poultry birds also needs essential nutrients like carbohydrates, proteins and minerals. The feed for larger poultry farm contains mashed cereals like bajra, wheat and maize, rice, beans and groundnut cake.

144) Explain why, in spite of the large population of cattle in our country, milk production is meagre.

In spite of the large population of cattle in our country, milk production is meagre because of :

a) the poor quality of feed given to the milch cattles.

b) poor storage of feed and fodder that are unavailable to cattle

c) Most of the cattle are indigenous breeds.

145. What steps should be taken to improve production of food from animal sourcs in or country?

The steps that should be taken to improve production of food from animal and poultry should be developed

i) Improved breeds of animal and poultry should be developed

ii) Proper care of health of the animals must be taken.

iii) The government organisations should encourage farmers to form co-operative organisations to promote animal husbandry, animal food and products.

146. Write two infectious diseases of each of cow, poultry and fishes.

Diseases of cow : Foot and mouth disease and cowpox.

Diseases of poultry : Fowl pox and Aspergillosis

Diseases of fish. : Infectious pancreatic necrosis and viral hemorrhagic septicaemia,

147. The production of food from animal sources has increased in last few decades. Justify this statement.

This production of food form animal sources has increased in last few decades by following new techniques in animal breeding. Operation Flood and Silver Revolution have increased the production of milk, and egg in last two decades. Simultaneously the production of fish and meat has also increased. India is now ranked 2nd among the fist producing countries. Out of the total fish obtained from Indian Ocean about 40% are produced in India.

148. What are the desirable traits for which improved varieties are developed by cross-breeding programmes between indigenous and exotic breeds in poultry? What are the advantages of exotic breeds?

The desirable traits for which improved varieties are developed by cross- breeding programmes between indigenous and exotic breeds are as follows:

i) Improved quality and number of chicken

ii) Dwarf broiler parent for commercial chick production.

iii) Summer or adaptation capacity for tolerance to high temperature

iv) Low maintenance requirements

v) Improvement in hen housed for egg production and reduction in the size of the layer with ability to utilise more fibrous diet formulated using agricultural by-products.

Advantages of exotic breeds :

i) They are small in size and eat less as compared to indigenous variety.

ii) They mature easily

iii) They yield more eggs and meat.

149. How many types of honeybees are present in one colony? What are their functions?

There are three types of honeybee 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 lays both fertile and unfertile eggs. Queen and workers emerge from fertile eggs where as 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 act as guards, the security force of the colony.

150. How cultivation practices and crop yield are related to weather, soil quality and availability of water?

Different crop require different climatic conditions, temperature and soil quality for their growth and completion of life cycle. As for example there are some crop which grow in rainy season and have high water requirement, called kharif crops e.g.

paddy, maize, cotton etc. There are crops that have low water requirement , need low temperature to grow in winter season. Which are called rabi crops e.g. mustard, gram, wheat etc,

Crop like paddy are water intensive crop and are grown in clayey soil which has high water intention capacity.

Thus cultivation practices are based on weather soil quality and availability of water.

151. Explain (i) no cost production (ii) low cost production iii) high cost production in terms of production practices.

i) No cost production : It means input cost for production is nil. Farmer s having poor purchasing capacity resort to such practice.

ii) Low cost production : It means input cost for production is minimum. Farmers having medium purchasing capacity go for such practice.

(iii) High cost production : It means high input cost for the production practices adopted. Farmers having very good financial conditions resort to such type of practice.

152. How increase in food production leads to degradation of environment and disturbance in maintaining balance?

To increase food production we destroy forest and bring more area under cultivation, which destroys ecological balance.

We intensively use fertilizers to increase production and continuous use of fertilizers destroys soil structure. We use pesticides to protect our food from insects and weeds. These chemicals pollute underground water and water bodies. Thus, our effort to increase food production leads to degradation of environment.

153. Is there a co-relation between higher inputs and yield.?

Financial conditions allow farmers to take up different farming practices. There is a co-relation between higher inputs and yields. Farmers' purchasing capacity for inputs decide cropping system and production practice. So, production practices can be at different levels such as no cost production or low cost production or high cost production.

154. How deficiency in nutrients affect plants?

Nutrients are supplied to plants by air, water and soil. There are sixteen nutrients which are called essential nutrients for plants. Deficiency in these nutrients for plants. Deficiency in these nutrients affect physiological processes in plants including growth, reproduction and susceptibility to diseases. To increase the yield, the soil can be enriched by supplying these nutrients in the form of manure and fertilizers.

155. Define weeding. Name some common tools used for weeding. Name some common tools used for weeding.

The process of removing weeds from a crop field is called weeding. It can be done either by hand-picking or by using certain tools.

The common tools are :

i) trowel (khurpa) ii) harrow (a big comb-like implement)

Trowel can be used even in the standing crops. Harrow can be used only before sowing or transplanting.

156. What is the biological method for controlling weeds? Give example.

In the biological method, some insects or other organisms are used in the crop field which consume and destroy the weed plants. These organisms selectively at away the weeds without Opuntia weeds

157. How do moisture and temperature affect the life of good materials ?

High moisture content and high temperature at the time of storage of any food material will decrease the life of food material due to:

i) growth of microorganisms and

ii) increased enzymatic spoilage of food

158. Classify fertilizers with suitable examples

Fertilizers are classified as :

Nitrogenous fertilizers	–	e.g. Urea
Phosphatic fertilizers	-	e.g . Triple superphosphate
Potassic fertilizers	-	e.g. Potassium chloride
Complex fertilizers	-	NPK

159. a) What are concentrates in animal feed?

b) Name two internal parasites that cause diseases in animals.

a) Concentrates 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 examples of concentrates.

b) Worms and flukes.

160. What are 'Sahiwal ' and 'Jersey' breeds? What is the use of these breeds?

Sahiwal is an indigenous cow breed of superior variety. It is mainly found in the regions of Punjab. Haryana and Uttar Pradesh

Jersey is an exotic breed of cow found un an Island of Jersey.

Both Jersey and Sahiwal are high milk-yielding breeds of cow.

161. Discuss the various types of diseases that affect cattle causing death and reduce milk production in them. Cattle suffer from a number of diseases which cause death and reduces milk production

Parasites of Internal cattle may be both internal or external. External parasites mainly live on skin diseases . Internal parasites like worms affect stomach and intensive while flukes damage the liver. Infectious diseases are also caused by bacteria and viruses

162. Why simply increasing grain production for storage in warehouses cannot solve the problem of malnutrition and hunger?

Simply increasing food production for storage in warehouse is not a solution to the problem of mal nutrition and hunger. People should have money to purchase food. Food security depends on both availability food and access to it. Majority of our population depends on agriculture for their livelihood. Increasing income of people working in agriculture sector is therefore necessary to combat the problem of hunger and malnutrition.

I. Long answer type questions

163. What are the important considerations to obtain good quality and higher yields of honey?

The important considerations to obtain good quality and higher yield of honey are :

i) Pasturage / Crop : Quality of honey depends upon the pasturage/crop available for the nectar and pollen collection.

ii) Beehive : A beehive, made of wooden chamber for the queen bee to lay eggs and honey collection.

iii) Apiary location : Apiary means setting up of a number of beehives in good and desirable location in such a systematic manner which allows maximum nectar and pollen collection.

iv) Honey flow and seasons : At a given location in a season, the duration of availability of abundance of flora is responsible for high yield of honey. This total time period of bees to collect nectar and pollen is called honey flow period.

v) Swarming : The new queen leaves the old hive to produce off springs 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/crop 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 also preys upon bees.

164. a) Name two common sources from which fish are captured

b) Why are mussels and shell fish cultivated?

c) As marine fish stock get depleted., how the demand for more fish can be met?

d) Name two marine fish of high economic value, which are also cultured in sea water.

a) Following are two common sources from which fish are captured:

i) Natural resources , e.g. sea, ocean, river etc.

ii) By fish farming in fresh water and marine water.

b) Mussels have high nutritive value. It is a good source of vitamins and have desirable fatty acids that improves brain function and also gives important minerals like zinc that boosts immunity. Similarly , shell fish is also rich in vitamins, minerals fish oil and it also brings in good revenue as sea food.

c) The demand for more fish can be met with mariculture. Mariculture is the practice of cultivating only marine organisms for commercial purposes.

Advantages of mariculture are as follows:

(i) It is cultivated from food and products that gives economical value and is important for industrial fishing.

(ii) Farming of marine fish, prawn, shell fish are done in open ocean or artificial ponds filled with sea water.

d) Generally, fished from high seas are caught by-long, gill nets, purse seines and bottom trawlers.

e) The marine fished that are cultivated in the sea and has high economic value are :

i) Bhetki ii) Mullets iii) Pearl spot

165. a) Distinguish between macronutrients and micronutrients on the basis of

i) their functions ii) amount required by plants

b) Classify the following elements as macro or micronutrients in plants.

i) Nitrogen ii) Zinc iii) Copper iv) Potassium

c) In what way deficiency of these nutrients harmful to crops?

a)

Macronutrient	Micronutrient
i) Macronutrients are involved in forming carbon compounds in energy storage reactions (photosynthesis) ii) Utilised by plants in large quantities	i) Micronutrients are the minerals involve in enzymatic reactions ii) Utilised by plants in small quantities

b) i) Nitrogen – Macronutrient ii) Zinc- Micronutrient

iii) Copper – Micronutrient iv) Potassium – Macronutrient

c) Deficiency of nutrients affect physiological processes in plants including reproduction, growth and susceptibility to diseases.

166. Define genetically modified crops. How are they made? Explain the significance of genetically modified crops with suitable example.

Genetically modified crops are those plants in which the DNA have been modified using genetic engineering techniques. The aim of making GM crop is to introduce a new trait into the plant which does not occur naturally in the species.

Technique : In GM crop, genes are added or removed using genetic engineering technique. In this technique, DNA from another species of the same kingdom is bound to tiny particles of gold or tungsten which are subsequently shot into plant tissue under high pressure. The accelerated particles penetrate both the cell wall and membranes. The DNA gets separated from the metal and is integrated into the plant DNA inside the nucleus.

Significance:

GM crop has increased yield of crop. Due to higher yield, it gives more income and has made the economic conditions of farmers cultivating GM crop better. While on one hand, farming land area is almost constant and the human population is increasing everyday. GM crop has made it possible to feed the growing population even thought the farming land remains constant.

167. Crop Protection Management includes protection from weeds, from insects, pests and disease. Describe briefly how the plants are protected from above mentioned unwanted agents.

Crop are affected by large numbers of weeds, insects, pests and diseases. If these are not controlled at appropriate time, then they damage the crop so much that most of the crop is lost. Weeds are unwanted plants in the cultivated field. They compete for food, space and light with the crop. Weeds take up nutrients and reduces growth of the crop. Insect pests attack the crop in three ways. (i) they cut the root (ii) suck the cell sap and (iii) bore into the stem and fruits. They thus affect the health of the crop and reduce the yield. Diseases in plants are caused by pathogens such as bacteria , fungi and viruses.

Weeds, insects and diseases can be controlled in various ways. One of the most commonly used method is the use of pesticide which include, herbicide, insecticide and fungicide. These chemicals are sprayed on crop plant. Weeds can also be removed by mechanical method.

Preventive methods of controlling weeds are proper seed bed preparation, timely sowing of crop, intercropping and crop rotation. Preventive measures against pests are to use of resistant varieties and summer deep ploughing of land.

168. a) List six factors for which the variety improvement of crops is aimed at?
b) Explain two advantages of mixed cropping

a) Six factors for which variety improvement of crops is aimed at are:

i) **High yield :** Crop with high yield are required to meet the demand for crop to feed the growing population

ii) **Disease resistance :** Diseases reduce yield are required to meet the demand for corp to feed the growing population.

iii) **Response to fertilizer :** Crop which gives good response to fertilizer also gives good yield.

iv**) Product Quality** : Good quality products always fetch better price and hence farmers to cultivate crop in non rainy season.

v) **Water demand :** Low water intensive characteristic helps farmers to cultivate crop in non rainy season.

vi) **Early maturity :** Crop which matures early gives the yield early.

b) **Advantages if mixed cropping** :

i) The risk of total crop failure due to uncertain monsoon is reduced.
ii) Due to component crops.
Due to complimentary effect of component crops, yield or both crops is increased e.g. wheat and gram

169. i) How many nutrients are essential for plants?

ii) What are macronutrients and micronutrients?

iii) List the nutrients supplied by air, water and soil

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 from 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 from 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, Oxygen
Soil	i) Macronutrients
	ii) Micronutrients

170. a) Differentiate between mixed cropping and inter-cropping. Give one example of each.

b) How is crop-rotation different from the above two?

c) Mention the factors that are taken into consideration for deciding choice of crops for inter-cropping and crop rotation. Also mention one advantage of each of these cropping patterns

a)

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 fertilizer application to individual crop is difficult.	iv) Fertilizers 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 Example of mixed cropping : wheat + mustard	vii) Product of each crop can be marketed and consumed separately. Example of inter cropping : soyabean + maize.

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

c) In intercropping, 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 :

Intercropping : It ensures maximum utilization of the nutrients supplied

Mixed cropping : The risk of total crop failure due to uncertain monsoon is reduced

Crop Rotation : It enhances production by increasing the soil fertility

171. a) Ajay, an illiterate farmer does not understand the difference between manures and fertilizers. Help him to differentiate between the two, in terms of their composition.

b) Justify the use of manure highlighting two of its advantages

c) Mention one drawback of excessive use of fertilizers.

Differences between :

Manure	Fertilizer
i) A manure is a natural substance obtained by the decomposition of animal wastes and plant residues.	i) A fertilizer 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 contains small amounts of essential 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, nutrient present in a fertilizer 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 microorganisms are effected.

172. What are pests? What are their effects on crop? Write their effects with reference to insect pests.

Any organism that caused economic damage or loss to the crop is known as a 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, etc, 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.

173. i) List two reason in favour of beekeeping to be used for honey production. Name an Italian bee variety brought to India to increase the yield of honey.

ii) State the four characteristics of this bee which makes it better than local varieties.

iii) State two factors on which quality of honey depends.

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 cerana indica is an Indian variety of bee for honey production

Apis mellifera is an Italian variety of bee brought to increase the production of honey.

ii) a) They have high honey collection capacity

b) They sting less depends on the pasturage

c) They stay in a given beehive for long period.

d) The breed very well.

iii) Quality of honey

174. Explain the different phases of life of poultry. Name the causes of diseases in poultry birds.

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 suppress the growth.

ii) Laying period : The period from sexual maturity in the life of poultry is called growing 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

175. Explain the following :

i) Milch animal ii) Draught animals iii) Sustainable agriculture

iv) White revolution v) Fodder crops

i) **Milch animal :** Breeds which produce milk are called Milch animals. E.g. buffalo, goat.

ii) **Draught animals :** The breeds which are strong and sturdy but produce less of milk are called draught animals. They are generally used for agricultural purposes.

iii) **Sustainable agriculture:** Agriculture which increases food production without degrading the environment and keep the balance of the environment is called sustainable agriculture.

iv) **White revolution :** White revolution in India was a plan started in 1970 which converted India from a milk deficient nation to the world's largest milk producer by 1998.

v) **Fodder crops :** Crops that are cultivated primarily as animal feed are called fodder crop e.g. Berseem, Oats, etc.

176. Write the criteria for selection of the crop for mixed cropping.

The criteria for selection of the crop for mixed cropping are:

i) **Duration of Crop :** Out of two crops, one is of long duration and another is of short duration.

ii) **Growth habit :** One should be tall growing and other is short growing.

iii) **Root pattern :** One is deep-rooted while the other is shallow-rooted while the other is shallow-rooted.

iv**) Water need:** One needs comparatively lesser amount of water whereas the other has more water requirement.

v**) Nutrient demand :** The nutrient requirements should also be different

177. What is animal husbandry ? Differentiate between milch and draught animals. What do the following supply to diary animals : (i) roughage ii) concentrates?

Animal husbandry : It is the science of rearing, feeding, caring breeding and utilisation of animals. In other word, it is the scientific management of animal livestock.

Milch animals : The milk producing animals or breeds such as cows, buffaloes, goats and camels are known as milch animals.

Draught animals : They are strong, sturdy and are the "beasts of burden". These breeds are generally used for agricultural purposes.

Roughage: It is a course and fibrous food with low nutritive value, such as green fodder, silage hay and legumes.

Concentrates : These are the substances which are rich in one or more nutrients and are low in fibre value. Mixture of cotton seeds, oil seeds, oil cakes and some cereals like gram and bajra are some typical concentrates.

178) Distinguish between:

a) Inland fishery and marine fishery b) Culture fishery and capture fishery
c) Apiculture and aquaculture

a) Differences between Inland fishery and marine fishery:

i) These fish rearing areas are in fresh or brackish water ii) Inland fisheries are of two types : culture fishery and capture fishery e.g. Rohu, catla	i) These fish rearing areas are in sea or marine water. ii) Marine fisheries are of three types coastal, offshore and deep sea. e.g. bhetki, pomphret

b) Differences between culture fishery and capture fishery :

i) It is the growing and rearing of fished within a restricted area with care. ii) Only matured fishes re captured	i) These are the type of fishing activities for capturing fished directly from rivers, lakes and oceans ii) Captured fishes are both matured and immatured.

c) Differences between apiculture and Aquaculture :

i) Apiculture is the rearing, care and management of honey bees for obtaining honey, wax and other substances	i) Aquaculture is the rearing, care and management of fishes for fish production.

NCERT EXEMPLAR

I. Short answer type question

1. Match the column A with Column B

(A)	(B)
a) Catla	i) Bottom feeders
b) Rohu	ii) Surface feeders
c) Mrigal	iii) Middle –zone feeders
d) Fish farming	iv) Culture fishery

a. ii	b. iii	c. i	d. iv

2. Fill in the blanks

a) Piegon pea is a good source of _____

b) Berseem is an important _____crop

c) The crops which are grown in rainy season are called _____crops

d) _____ are rich in vitamins

e) _____ crop grows in winter season

a. Protein	b. fodder	c. kharif	d. Vegetables	e. Rabi

3. What is a GM crop? Name any one such crop which is grown in India.

Genetically modified (GM) crop is the crop which has been developed by introducing some specific gene from any other source, to obtain the desire character

Example : Bt cotton is made insect – resistant by introducing a new gene from a bacteria.

4. List out some useful traits in improved crop.

Traits of improved crops are as follows

(i) Improved nutritional quality

ii) higher yield

iii) resistance to biotic and abiotic stresses

iv) Change in maturity

v) Wide adaptability

vi) desired agronomic traits

5. Why is organic matter important for crop production?

Importance of organic matter in crop production:

i) humus makes soil fertile

ii) Soil structure is improved

iii) Water holding capacity of sandy soil increases

iv) solves water logging problem

v) solves water logging problem

vi) soil is enriched due to mineral decomposition

v) helps crop growth due to the presence of biochemicals.

6. Why is excess use of fertilizers detrimental for environment?

Excess use of fertilizers causes :

i) Environmental pollution as their residual and unused amounts will become pollutants for air, water and soil.

ii) excess minerals in crop in crop plants.

iii) salination of soil

iv) eutrophication of water bodies

7. Give one word for the following :

a) Farming without the use of chemicals as fertilizers, herbicides and pesticides is known as _____.

b) Growing of wheat and groundnut on the same field is called as _____.

c) Planting soyabean and maize in alternate rows on the same field is called as _____.

d) Growing different crops on a piece of land in pre-planned succession is known as _____.

e) Xanthium and Parthenium are commonly known as _____.

f) Causal organism of any disease is called as _____.

a. Organic farming	b. Mixed cropping	c. Intercropping	d. Crop rotation
e. Weeds	f. Pathogen		

8. Match the following :

A	B
a) Cattle used for tilling and carting	i) Milk producing female
b) Indian breed of chicken	ii) Broiler
c) Sahiwal, Red Sindhi	iii) Draught animals
d) Milch	iv) Local breed of cattle
e) Chicken, better fed for obtaining meat	v) Aseel

a) (iii)	b) (v)	c) (iv)	d) (i)	e) (ii)

9. If there is low rainfall in village throughout the year, what measures will you suggest to the farmers for better cropping ?

For better cropping, farmers of low rainfall area will be suggested to :

i) enrich the soil with humus which increases the water-holding capacity and retains water for longer duration.

ii) use of drought resistant and early maturing varieties of crops.

iii) reduce tilling

10. Group the following and tabulate them as energy yielding, protein yielding, oil yielding and fodder crop.

Energy yielding - wheat, rice, maize

Protein yielding - gram, pigeon pea, gram, lentil, soyabean

Oil yielding - groundnut, castor, mustard, soyabean

Fodder crops - barseem, oat, sudan grass

11. Define the term hybridisation and photoperiod

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. Fill in the blanks:

a) Photoperiod affect the _____.

b) Kharif crops are cultivated from _____ to _____.

c) Rabi crops are cultivated from _____ to _____.

d) Paddy, maize, green gram and black gram are _____ crops

e) Wheat, gram, pea, mustard are _____ crops .

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

13. Cultivation practices and crop yield are related to environmental condition. Explain.

Cultivation practices of different crops require different climatic conditions, requirements of different crops for growth vary. They may require high temperature or low temperature, longer duration of sunlight or shorter duration of sunlight, more humidity or low humidity of moderate humidity, sandy soil or 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. Fill in the blanks :

a) A total of _____ nutrients are essential to plants,

b) _____ and _____ are supplied by air to plants.

c) _____ is supplied by water to plants

d) Soil supply _____ nutrients to plants.

e) _____ nutrients are required in large quantity by plants and called as _____.

f) _____ nutrients are needed in small quantity by plants and are called _____.

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

15. Differentiate between compost and vermicompost.

Differences :

Compost	Vermicompost
It is the manure prepared by the decomposition of organic matter like garbage, animal waste., domestic wastes. Microbes help in the decomposed.	It is the compost prepared by decomposition of organic waste by microorganisms. But it also employs earthworms which helps in pulverisation of organic waste.

16. Arrange these statements in correct sequence of preparation of green manure,

a) Green plants are decomposed in soil

b) Green plants are cultivated for preparing manure or crop plant parts are used

c) Plants are ploughed and mixed into the soil

d) After decomposition it becomes green manure.

(b) ⟶ (c) ⟶ (a) ⟶ (d)

17. An Italian bee variety Apis Mellifera has been introduced in India for honey production . Write about its merits over other varieties.

An Italian bee variety Apis Mellifera has been introduced in India for the following merits:

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. In agricultural practices, higher input gives higher yield. Discuss how.

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.

19. Give the merits and demerits of fish culture.

Or

What are the advantages of fish farming?

Merits of Fish Culture

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

ii) Improvement on fish cultivation 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.

20. What do you understand by composite fish culture?

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 with each other for food.

For example , Catla 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 feed at the bottom and grass carp feeds on aquatic plants in the pond.

21. Name two types of animal feed and write their functions

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.

I. Long answer type question

22. Differences between the following :

i) Capture fishery and culture fishery

ii) Mixed cropping and intercropping

iii) Bee-keeping and Poultry farming

i. Differences :

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

ii) Crop Rotation is defined as the practice of growing different crops on a piece of land in a pre-planned succession/pattern

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.

Availability of moisture and irrigation facility should be kept in mind in choosing plants for crop rotation.

iii) Differences :

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

23. Discuss why pesticides are used in very accurate concentration and in very appropriate manner?

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

i) harms the soul and caused 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

vi) enter the crop plants and make them toxic

vii) enter the crop plants and make them toxic

viii) pass into surface water and harm the aquatic organisms

24. What would happen if poultry birds are larger in size and have no summer adaptation capacity? In order go get small sized poultry birds, having summer adaptability , what methods will be employed?

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

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

Small sized birds are preferred for

i) Lower requirement of feed

ii) Higher egg laying capacity

iii) Lower requirement for space

25. Suggest some preventive measures for the diseases of poultry birds.

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 done at regular intervals.

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

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

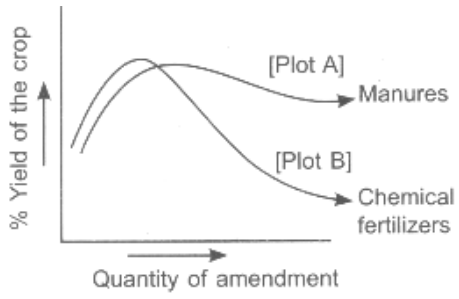
v) Every bird should be vaccinated at regular interval to minimise any attack of common infections diseases.

26. Figure shows the two crop fields [Plots A and B] have been treated by manures and chemical fertilizers respectively, keeping other environmental factors same. Observe the graph and answer the following questions

i) Why does plot B show sudden increase and then gradual decrease in yield?

ii) Why is the highest peak in plot A graph slightly delayed?

iii) What is the reason for the different pattern of the two graphs?



i) The sudden increase is due to chemical fertilizer that supplies the minerals in good quantity. Gradual decrease is due to deletion 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 they contain large amounts of organic matter. They enriches soil with nutrients thereby increasing soil fertility.

iii) The difference in the two graphs indicates that manuring the soil is more the soil is more beneficial than the use of chemical fertilizers. Use of fertilisers is harmful, when used in large quantity.

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 loss of soil fertility affecting the yield.