

Chapter 8

Improvement in Food Resources

- All living organisms depend on food sources either on plants or animals to fulfil the requirements of proteins, carbohydrates, fats, vitamins and minerals.
- We can increase the production by the development and use of improved varieties with high yield and better agricultural practices.
- **Green revolution** has increased food grain production while **white revolution** has increased production of milk.
- Cereals, pulses, vegetables, spices and fruits provide carbohydrates, proteins, fats, vitamins and minerals etc.
- Fodder crops like berseem, oats or sudan grass are raised as food for the livestock.
- **Based on the seasons of cultivation, crops are classified in two categories:**
 - (i) **Kharif Crops** : Crops grown in rainy season from July to October are kharif crops. Example: Paddy, soyabean, maize, cotton, and green gram etc.
 - (ii) **Rabi Crops** : Crops grown in winter season from November to April are rabi crops. Example: Wheat, gram, peas, mustard and linseed etc.
- **For improvement in crop production following practices are involved in farming –**
 - (i) Choice of seeds for planting
 - (ii) Nurturing of crop plants
 - (iii) Protection of growing and harvested crops from loss
- **The major activities for improving crop yields can be classified as**
 - (i) **Crop variety improvement** : Varieties of crops can be selected by breeding for certain useful characteristics such as disease resistance, response to fertilisers, product quality and high yield. Two ways of crop variety improvement are
 - A. **Hybridisation**: Crossing between genetically dissimilar plants is hybridization. The crossing may be **intervarietal** (between different varieties), **intergeneric** (between different genera), **interspecific** (between different species of the same genus). The most common type of breeding is intervarietal.
 - B. **Introducing genes for desired characters** – It gives rise to genetically modified crops.
 - The various aspects for which crop variety improvement is carried out are as follows:
 1. To obtain higher yield of crop.
 2. To enhance the desirable quality of food items.
 3. To produce crop variety that is resistant to biotic and abiotic factors.
 4. To change the maturity duration of crop.
 5. To induce desirable agronomic traits.
 6. **To develop plant varieties with wider adaptability.**

(ii) **Crop production management** : In India the money or financial condition of farmers decides the farming practices and agricultural technologies for more production.

A. Nutrient management

Plant need nutrients for their growth which is supplied by air, water and soil.

Air supplies carbon and oxygen, water supplies hydrogen, soil supplies other 13 nutrients.

Of the six macronutrients, only three namely **NPK (Nitrogen, Phosphorus and Potassium)** are required by plants in greater amounts. They are called **primary nutrients**.

1. **Micronutrients**: Nutrients required in small quantities are called micronutrients. E.g. Mo, Mn, Cl, Cu, B, Zn, Fe.
2. **Macronutrients**: Nutrients required in larger quantities are called macronutrients. E.g. P, Mg, K, N, Ca, S.

Manure and Fertilizers :

1. **Manure**: It is prepared by decomposition of animal excreta and plant waste. Now-a-days we use biological wastes in manure. Based on the kind of biological material used, manure can be classified as –

- (a) **Compost** – The decomposition of livestock excreta, vegetable waste, animal refuse, domestic waste, sewage waste, straw, weeds in pits is known as composting. It is also prepared by using earthworms to hasten the process of decomposition of plant and animal refuse. This is called **vermi-composting**.
- (b) **Green manure** – Plants like sunhemp or guar are grown and then mulched by ploughing them into the soil. This is green manure. They provide nitrogen and phosphorus to soil.

2. **Fertilizers**: They commercially produced plant nutrients. They supply nitrogen, phosphorus in higher yields of high cost farming. But continuous use of fertilizers can destroy soil fertility because excess use of fertilizers kill micro-organisms.

3. **Organic farming**: It is a farming system using organic manures, recycled farm-wastes and use of bio-agents such as culture of blue-green algae in preparation of biofertilisers, neem leaves or turmeric specifically in grain-storage as bio-pesticides.

C. Irrigation

Most agricultural areas in India depend upon monsoons and rainfall during growing season. Various irrigation systems are adopted to supply water to agricultural lands, they are – Wells, canals, rivers, tanks etc. Rain water harvesting and watershed management increases the availability of water.

D. Cropping Patterns•

- **Mixed cropping:** Growing two or more crops simultaneously on same land is mixed cropping.
- **Inter-cropping:** Growing two or more crops simultaneously on the same field in a definite pattern is inter cropping.
- **Crop-rotation:** Growing of different crops on a piece of land in a pre-planned succession is crop rotation.

(iii) Crop protection management

Crops need protection against weeds, insect pests and diseases. Weeds like **Xanthium**, **Parthenium**, **Cyperinus** competes for food, space and light. They take nutrients and reduce the growth of the main crop. Pests are organisms like rats, insects, mites, fungi etc that damage or destroy cultivated plants or plant products and make them unfit for human consumption.

Micro-organisms or pathogens cause diseases in crop plants. Pathogens can be bacteria, fungi, or virus. These pathogens are generally transmitted through soil, water, and air.

Preventive measures of insect pests and weeds :

Using pesticides is the most common method used to eradicate weeds, pests, and infectious diseases.

1. **Herbicides** are used to eradicate weeds.
2. **Fungicides** are used to destroy fungus.
3. **Insecticides** are used against insects.

• Animal husbandry :

It is the scientific management of animal livestock in various aspects such as feeding, breeding and disease control. The animal included are cattle, goat, poultry, sheep and fish.

(i) Cattle farming: It is done for two purposes-milk and drought labour for agricultural work such as tilling, irrigation and carting. Indian cattle belong to two different species **Bos indicus**, cows and **Bos bubalis**, buffaloes.

(ii) Poultry farming : They are farmed to produce layers for eggs and broilers for meat. The cross-breeding programmes between Indian and foreign breeds are done for improving the following desirable traits –

- (i) Number and quality of chicks.
- (ii) Dwarf broiler parent for commercial chick production.
- (iii) Summer adaptation capacity.

(iii) Fish production: It provides animal protein for us.

Fishes are obtained in two ways :-

- Capture fishing obtained from natural resources.
- Culture farming obtained by fish farming.

Culture fishing can be done in both marine and fresh water ecosystems.

A. Marine fisheries: India's marine fishery resources include 7,500 km of coastline and the deep seas. Marine fish varieties are **Pomphret**, **mackerel**, **tuna** etc. High economic value fishes are farmed in sea water. E.g., **Mullets**, **bhetki**, **pearl spots** etc.

B. Inland fisheries : Fish culture is in composite fish culture systems. In this both local and imported fish species are used. Composite fish culture systems increase the yield of fish. In this system, a combination of 5-6 fish species is used in a single fish pond. All these species together use all the food in the pond without competing with each other.

A major problem in fish farming is the lack of availability of good quality seed. To solve the problem of availability of good-quality seed the fishes are bred in ponds using hormonal stimulation.

(iv) Bee-keeping

It has become an agricultural enterprise for honey production. Its a low investment activity and produces wax also. Local varieties of bees used for honey production are – **Apis cerana indica** (Indian bee), **A. dorsata** (Rock bee), **A. florea** (little bee). Italian bees have high honey collection capacity. The quality of honey depends upon availability of flowers.

Exercise 1

DIRECTIONS : This section contains multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which only one is correct.

1. The best way to increase the yield of wheat in India is
 - to sow seeds of improved varieties.
 - to use tractors.
 - to reduce the quantity of ration consumers.
 - to remove weeds from wheat fields.
2. A plant cell has potential to develop into full plant. This property of the plant cell is called
 - tissue culture
 - totipotency
 - pleuripotency
 - gene cloning
3. Cultivation of *Bt* cotton has been much the news. The prefix “*Bt*” means
 - “Barium-treated” cotton seeds
 - “Bigger thread” variety of cotton with better tensile strength
 - Production by “biotechnology” using restriction enzymes and ligases
 - Carrying an endotoxin gene from *Bacillus thuringiensis*

4. Fowl grown only for meat is known as
 - hybrid
 - broiler
 - milch
 - bird culture
5. Increase in food production has been possible by the success of
 - green revolution
 - white revolution
 - red revolution
 - green revolution for food grain and white revolution for milk
6. Food security depends upon
 - availability of food
 - access to food
 - both availability of food and access to it
 - government policies only
7. Sustained livelihood can be achieved by use of
 - mixed farming
 - intercropping
 - integrated farming practices
 - All of these

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Scholastic Aptitude Test (SAT) — BIOLOGY

8. Cereals such as wheat, rice, and maize provide us
 (1) carbohydrates for energy requirement
 (2) proteins for body building
 (3) fats
 (4) All of these

9. Pulses such as gram, green gram, pigeon pea and lentil provide us
 (1) proteins for body building
 (2) fats
 (3) carbohydrates for energy requirement
 (4) All of these

10. The term 'aquaculture' means
 (1) cattle breeding (2) marine fisheries
 (3) inland fisheries (4) Both (2) and (3)

11. First commercial pesticide was
 (1) DDT (2) 2,4-D
 (3) Burgandy mixture (4) Bordeaux mixture

12. The carnivorous fish *Gamusia*, introduced in the lakes, ponds, etc., control a deadly disease in India, feeds on the larvae of
 (1) *Nephantis* (2) Dragonfly
 (3) *Anopheles* (4) All of these

13. Fish that eradicates the mosquito larvae, is
 (1) *Anabus* (2) *Rohu*
 (3) *Gambusia* (4) *Cutter fish*

14. Vitamins and minerals are provided by
 (1) cereals
 (2) vegetable, spices and fruits
 (3) pulses
 (4) fodder

15. Select the least probable statement
 (1) Photoperiods are related to the duration of sunlight.
 (2) Different crops require different climatic conditions, temperature and photoperiods for their growth and completion of life cycle.
 (3) Crops grown in rainy season are called the kharif crops.
 (4) Mustard, linseed and peas are grown in kharif season.

16. The activities for improving crops yields are
 (1) crop variety improvement
 (2) crop production improvement
 (3) crop production management
 (4) All of these

17. Hybridization
 (1) is done to incorporate desirable characteristics into crop varieties.
 (2) refers to crossing between genetically dissimilar plants.
 (3) may be intervarietal or interspecific.
 (4) All these statements are correct.

18. Variety improvement is done to get higher yield not only by making it tolerant to high salinity or diverse climatic conditions, but also
 (1) to increase resistance to biotic or abiotic stresses.
 (2) change the maturity duration.
 (3) to get desirable agronomic characteristics.
 (4) All of these

19. Biological control of agricultural pests, unlike the chemical control, is
 (1) toxic (2) polluting
 (3) very expensive (4) self-perpetuating

20. Which of the following plants are used as green manure in crop fields and in sandy soils ?
 (1) *Dicanthium annulatum* and *Azolla pinnata*
 (2) *Crotalaria juncea* and *Alhagi camelorum*
 (3) *Calotropis procera* and *Pitylanthus niruri*
 (4) *Saccharum munja* and *Lantana camara*

21. Which one is a biofertilizer ?
 (1) VAM (2) Sporeine
 (3) Devine (4) Agent orange

22. Which one is an improved variety of wheat ?
 (1) A.77 (2) Sonalika
 (3) Chandramukhi (4) Kuber

23. There are _____ nutrients that are essential for plants.
 (1) Six (2) Three
 (3) Sixteen (4) Seven

24. Macronutrients available from soil are
 (1) carbon, oxygen, nitrogen, phosphorus, copper and chlorine.
 (2) carbon, oxygen, hydrogen, calcium, Sulphur and zinc.
 (3) nitrogen, phosphorus, potassium, calcium, magnesium and sulphur.
 (4) iron, manganese, boron, zinc, copper, molybdenum and chlorine.

25. Manure helps in improving soil fertility and structure by supplying small quantities of nutrients. It is also advantageous in
 (1) protecting environment from excessive use of fertilizers
 (2) recycling farm waste
 (3) disposing biological waste
 (4) All of these

26. Select the unsuitable statement
 (1) Compost and vermi-compost require decomposition of farm waste material in pits.
 (2) Compost is rich in organic matter and nutrients.
 (3) Use of earthworms to hasten decomposition of plant and animal refuse produce vermi-compost.
 (4) Compost is used in very little quantities.

27. The practice of mulching specially grown sun hemp or guar by ploughing them into the soil helps in
 (1) increasing water holding capacity.
 (2) enriching the soil in nitrogen and phosphorus.
 (3) increasing the quantity of earthworms.
 (4) None of these

28. Fertilizers ensure increased vegetative growth and healthy plants by supplying
 (1) nitrogen, carbon and oxygen
 (2) nitrogen, phosphorus and potassium
 (3) phosphorus, calcium and oxygen
 (4) All of these

29. Find out the correct sentence(s)
 (i) Hybridisation means crossing between genetically dissimilar plants.
 (ii) Cross between two varieties is called as inter specific hybridisation.
 (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 hybridisation.
 (1) (i) and (iii) (2) (ii) and (iv)
 (3) (ii) and (iii) (4) (iii) and (iv)

30. Find out the correct sentence(s) about manure
 (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.
 (1) (i) and (iii) (2) (i) and (ii)
 (3) (ii) and (iii) (4) (iii) and (iv)

31. Cattle husbandry is done for the following purposes
 (i) Milk production (ii) Agriculture work
 (iii) Meat production (iv) Egg production
 (1) (i), (ii) and (iii) (2) (ii), (iii) and (iv)
 (3) (iii) and (iv) (4) (i) and (iv)

32. Which of the following are Indian cattle ?
 (i) *Bos indicus* (ii) *Bos domesticus*
 (iii) *Bos bubalis* (iv) *Bos vulgaris*
 (1) (i) and (iii) (2) (i) and (ii)
 (3) (ii) and (iii) (4) (iii) and (iv)

33. Fertilizers should be used carefully because
 (1) increase in soil fertility is only short lived.
 (2) they can be harmful to the micro-organisms present in the soil.
 (3) they can lead to water pollution.
 (4) All of these

34. Organic farming is a farming system with _____ use of chemicals such as fertilizers, herbicides or pesticides and with a _____ input of organic manures.
 (1) almost no, minimum
 (2) minimal, maximum
 (3) maximum, minimum
 (4) excessive, little

35. Use of neem leaves or turmeric during grain storage serves the purpose of
 (1) bio-pesticides
 (2) providing nutrients
 (3) impart the desired colours to the grain
 (4) preparation of biofertilizers

36. Mixed cropping is
 (1) growing same crops in different seasons.
 (2) growing two or more crops simultaneously on the same piece of land in a haphazard manner.
 (3) growing two or more crops simultaneously on the same field in a definite pattern.
 (4) growing different crops on a piece of land in a preplanned succession.

37. Which of the following are exotic breeds ?
 (i) Brawn (ii) Jersey
 (iii) Brown Swiss (iv) Jersey Swiss
 (1) (i) and (iii) (2) (ii) and (iii)
 (3) (i) and (iv) (4) (ii) and (iv)

38. Poultry farming is undertaken to raise following
 (i) Egg production (ii) Feather production
 (iii) Chicken meat (iv) Milk production
 (1) (i) and (iii) (2) (i) and (ii)
 (3) (ii) and (iii) (4) (iii) and (iv)

39. Animal husbandry is the scientific management of
 (i) animal breeding (ii) culture of animals
 (iii) animal livestock (iv) rearing of animals
 (1) (i), (ii) and (iii) (2) (ii), (iii) and (iv)
 (3) (i), (ii) and (iv) (4) (i), (iii) and (iv)

40. Kranti, Pusa Agarni and Pusa Bold are improved varieties of
 (1) urad bean (2) sunflower
 (3) chick Pea (4) mustard

41. Insect pests damage the crop by
 (1) cutting the root, stem and leaf.
 (2) sucking the cell sap.
 (3) boring into the stems and fruits.
 (4) All of these

42. Milk production depends on
 (1) cleaning of shelter
 (2) lactation period of milch animal
 (3) vaccination of animals
 (4) None of these

43. Select the incorrect statement from the following:
 Cross breeding programmes between Indian and foreign breeds for variety improvement are focused on
 (1) dwarf broiler parent for commercial chick population.
 (2) low maintenance requirements and enhanced tolerance to high temperature.
 (3) large number of chicks irrespective of their quality.
 (4) reduction in the size of egg-laying bird with ability to utilize fibrous cheaper diets.

44. Composite fish culture increases the fish yield from a pond by growing a number of fish species in such a way that they don't compete for food, but the problem is
 (1) they breed only during monsoon
 (2) lack of availability of good quality seed
 (3) Both (1) and (2)
 (4) None of these

45. What will happen if two drops of iodine solution are added to crushed materials of sago, sugar, chalk and common salt to which a few drops of water had been added.
 (1) No change in salt
 (2) No change in chalk
 (3) No change in sugar
 (4) Blue-black colour appeared in sago

46. Rice is crushed and a solution made of it. A student poured a drop of iodine solution in small quantity of rice solution. Another student poured a drop of rice solution in iodine solution.
 (1) Solution of the first boy turned blue black but that of the other didn't.
 (2) Solution of the second boy turned blue black but that of the first did not.
 (3) No change in colour of the two solutions.
 (4) Both the solutions turned blue-black.

47. A lake with an inflow of domestic sewage rich in organic waste may result in
 (1) drying of the lake very soon due to algal bloom.
 (2) an increased production of fish due to lot of nutrient.
 (3) death of fish due to lack of oxygen.
 (4) increased population of aquatic web organism.

48. In poultry industry, production of hatching eggs is more expensive than the production of market eggs mainly because
 (1) cost of males and their depreciation value is high.
 (2) mortality among females is usually lower when they are mated with males.
 (3) number of eggs produced by hatchery flock are to be sold only as market eggs.
 (4) some of the eggs produced by hatchery flocks are not acceptable for incubation.

49. The most common activity followed by the farmers to generate additional income is
 (1) part-time jobs in industries
 (2) bee-keeping
 (3) star gazing
 (4) pumping of water

50. Biofertilizers are
 (1) micro organisms used to increase the fertility of the soil.
 (2) manure added to soil.
 (3) biochemicals added to soil.
 (4) None of the above

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Scholastic Aptitude Test (SAT) — BIOLOGY

51. Eutrophication is caused by
 (1) excessive use of fertilizers
 (2) excessive growing of crops
 (3) monocropping
 (4) None of the above

52. Green manure is formed by
 (1) decomposing animal residue
 (2) decomposing algae
 (3) ploughing of leguminous plants into the soil
 (4) decomposition of the dead plants and animal wastes

53. Major drawback of DDT as a pesticide is that
 (1) organisms at once develop resistance to it.
 (2) it is significantly less effective than other pesticides.
 (3) its cost of production is high.
 (4) it is not easily and rapidly degraded in nature.

54. The main source of food and fodder is
 (1) lichen (2) cereals
 (3) fungus (4) cotton

55. When muddy water is left undisturbed
 (i) the mud settles down.

(ii) some mud particles remain floating in water.
 (iii) the water can be decanted and separated.
 (iv) the process of filtration can be used to completely .
 Which of the above statement(s) is correct?
 (1) (iii) & (iv) (2) (i) only
 (3) (i) & (iv) (4) All the above

56. Which statement is false from the following option given below?
 (1) Watering the crops is called irrigation.
 (2) Combine is used for sowing of seeds.
 (3) Seed drill is used for sowing of seeds.
 (4) Weedicides are called to destroy weeds.

57. Livestock refers to
 (1) pet animals
 (2) poultry and pet animals
 (3) domestic animals which are kept for use or profit
 (4) None of the above

58. Honey is
 (1) acidic (2) neutral
 (3) alkaline (4) basic after some days

Exercise 2

Matching Based MCQ

DIRECTIONS (Qs. 1 to 6) : Match Column-I with Column-II and select the correct answer using the codes given below the columns.

1. **Column I** **Column II**
 (A) Micronutrient (p) Soyabean
 (B) Kharif crop (q) Bee
 (C) Rabi crop (r) Wheat
 (D) *Apis mellifera* (s) Molybdenum
 (1) A – (s), B – (p), C – (r), D – (q)
 (2) A – (p), B – (s), C – (r), D – (q)
 (3) A – (q), B – (r), C – (s), D – (p)
 (4) A – (p), B – (q), C – (r), D – (s)

2. **Column I** **Column II**
 (A) Kharif crops (p) Food for cattle
 (B) Rabi crops (q) Urea and super urea phosphate
 (C) Chemical fertilizers (r) Animal excreta, cowdung, urine and plant wastes
 (D) Organic manure (s) Wheat, grain, pea
 (t) Paddy and maize
 (1) A – (s), B – (t), C – (q), D – (r)
 (2) A – (q), B – (p), C – (t), D – (r)
 (3) A – (t), B – (s), C – (q), D – (r)
 (4) A – (q), B – (r), C – (s), D – (p)

3. **Column I** **Column II**
 (A) Ploughing (p) Cow Dung
 (B) Manure (q) Plough
 (C) Irrigation (r) Khurpi
 (D) Weeding (s) Dhekli

(1) A – (q), B – (p), C – (s), D – (r)
 (2) A – (s), B – (q), C – (r), D – (p)
 (3) A – (r), B – (p), C – (q), D – (s)
 (4) A – (r), B – (q), C – (p), D – (s)

4. **Column I** **Column II**
 (A) Urea (p) Harvesting and threshing
 (B) Combine (q) Sowing of seeds
 (C) Seed drills (r) Sprinklers
 (D) Irrigation (s) Fertilizers
 (1) A – (q), B – (s), C – (r), D – (p)
 (2) A – (s), B – (r), C – (q), D – (p)
 (3) A – (p), B – (q), C – (r), D – (s)
 (4) A – (s), B – (p), C – (q), D – (r)

5. **Column I** **Column II**
 (A) Marine fish (p) Carp culture
 (B) Fresh water fish (q) Apiculture
 (C) Bee Keeping (r) Mariculture
 (D) Composite fish (s) Aquaculture
 (1) A – (r); B – (s); C – (q); D – (p)
 (2) A – (p); B – (q); C – (r); D – (s)
 (3) A – (q); B – (s); C – (p); D – (r)
 (4) A – (s); B – (r); C – (q); D – (p)

6. **Column I** **Column II**
 (A) Cattle used for tilling (p) Milk producing female and carting
 (B) Indian breed of chicken (q) Broiler
 (C) Sahiwal, Red Sindhi (r) Drought animals
 (D) Milch (s) Local breed of cattle
 (E) Chicken better fed (t) Aseel for obtaining meat
 (1) A – (q); B – (t); C – (s); D – (p); E – (r)
 (2) A – (r); B – (t); C – (s); D – (p); E – (q)
 (3) A – (p); B – (t); C – (s); D – (r); E – (q)
 (4) A – (s); B – (t); C – (r); D – (p); E – (q)

Statement Based MCQ

7. Consider the following statements :

- Fish may be obtained from marine resources as well as inland resources.
- To increase production of fish, they can be cultured in marine and inland ecosystems.

Which of these statement(s) is/are correct ?

- (a) only
- (b) only
- Both (a) and (b)
- Neither (a) nor (b)

8. Consider the following statements :

- Rabi crops are growing in rainy season.
- Kharif crops are growing in winter season.

Which of these statement(s) is/are correct ?

- (a) only
- (b) only
- Both (a) and (b)
- Neither (a) nor (b)

9. Consider the following statements :

- Marine fish capture is done by fishing nets guided by echosounders and satellites.
- Rohu and Catla are carp fish.

Which of these statement(s) is/are correct ?

- (a) only
- (b) only
- Both (a) and (b)
- Neither (a) nor (b)

10. Consider the following statements :

- Beehive is made up of wax secreted by queen bee.
- Queen bee is a diploid, fertile female.

Which of these statement(s) is/are correct ?

- (a) only
- (b) only
- Both (a) and (b)
- Neither (a) nor (b)

11. Consider the following statements :

- Poultry farming is done to raise domestic fowls.
- Brahma and Cochin are exotic breeds of chicken.

Which of these statement(s) is/are correct ?

- (a) only
- (b) only
- Both (a) and (b)
- Neither (a) nor (b)

12. Consider the following statements :

- Hybrid is an individual or a variety obtained by crossbreeding two genetically dissimilar plants or animals.
- Rice weevil is a stored grain pest.

Which of these statement(s) is/are correct ?

- (a) only
- (b) only
- Both (a) and (b)
- Neither (a) nor (b)

13. Consider the following statements :

- Chicken flesh contains about 50% protein.
- Broilers are produced by interbreeding different breeds of fowl.

Which of these statement(s) is/are correct ?

- (a) only
- (b) only
- Both (a) and (b)
- Neither (a) nor (b)

14. Consider the following statements :

- Most fish production in inland water body is capture fishing.
- Bird flu is a bacterial disease.
- Mullets are marine fish farmed in sea water.

Which of these statement(s) is/are correct ?

- (a) only
- (b) only
- (c) only
- (a), (b) and (c)

Passage Based MCQ

DIRECTIONS (Qs. 15 to 20) : Read the passage(s) given below and answer the questions that follow.

PASSAGE-1

The practice of growing different crops on the same piece of land in a pre-planned succession is called **crop rotation**. If same crop is grown in a piece of land year after year, it reduces the fertility of the soil. Moreover, the disease causing pathogens get their hosts every year and so they multiply and increase in number. This can be avoided by growing different crops in a pre-planned succession. During crop rotation, leguminous crops are also grown in rotation with non-leguminous crops. Leguminous plants are provided roots. The root nodules contain nitrogen fixing bacteria (*Rhizobium*), which have the ability to fix up atmospheric nitrogen into nitrates and in turn enrich the soil.

- The practice of growing different crops on the same piece of land in a preplanned succession is called
 - crop modification
 - crop rotation
 - sustainable agriculture
 - mixed cropping
- The root nodules of leguminous plants contain
 - fungi
 - nitrogen fixing bacteria
 - algae
 - nematodes
- The root nodules of leguminous plants have the ability to fix
 - atmospheric nitrogen
 - atmospheric carbon
 - atmospheric hydrogen
 - atmospheric oxygen
- If same crop is grown in a piece of land year after year, it
 - reduces the fertility of the soil.
 - increases the fertility of the soil.
 - does not affect the fertility of the soil.
 - None of the above.

PASSAGE-2

Cattle farming or cattle husbandry is raising of cattle for yield of milk by females and draught labour connected with agriculture like tiling, irrigation and carting by males. In our country, milk producing animals are cows, buffaloes, goats and camels. The milk of buffalo contains more fat than cow's milk. Milk producing females are called milch or dairy animals, while males engaged in farm labour are called draught animals. However, there are certain breeds which have good milch females but poor draught males. They are called milch breeds.

- Milk producing females of cattles are called
 - milch
 - draught
 - broilers
 - layers
- Male cattles which are used for farm labour are called
 - milch animals
 - draught animals
 - Both (1) and (2)
 - None of these

Assertion Reason Based MCQ

DIRECTIONS (Qs. 21 to 28) : Following questions consist of two statements, one labelled as the '**Assertion**' and the other as '**Reason**'. You are to examine these two statements carefully and select the answer to these items using the code given below.

Code :

- (1) Both A and R are individually true and R is the correct explanation of A;
- (2) Both A and R are individually true but R is not the correct explanation of A.
- (3) A is true but R is false
- (4) A is false but R is true.

21. **Assertion :** Cattle breeds can be improved by superovulation and embryo transplanation.
Reason : Superovulation in high milk-yielding cows is induced by hormonal injection.

22. **Assertion :** The honey bee queen copulates only once in her life time.
Reason : The honey bee queen can lay fertilized as well as unfertilized eggs.

23. **Assertion :** Agricultural output increased several times after introduction of DDT.
Reason : DDT was the first insecticide use on a wide scale.

24. **Assertion :** Farmyard manure is the most commonly used organic manure in India.
Reason : Manure forms colloidal particles and soil crumbs.

25. **Assertion :** Intercropping checks the population of insects.
Reason : Plant pests can be controlled biologically by their natural parasites are pathogens.

26. **Assertion :** For crop improvement, wild varieties play an important role.
Reason : Wild varieties have better adapted to nature.

27. **Assertion :** Increase in ozone concentration near the earth's surface reduces crop yields.
Reason : Increase in ozone concentration in stratosphere protects us.

28. **Assertion :** Pulses are called "poor man's meat".
Reason : Pulses contain complete protein.

Correct Definition Based MCQ

29. *Rhizobium* bacteria is

- (1) the bacteria found in the intestines of animals which help in the digestion of cellulose present in their feed.
- (2) the bacteria which are used in sewage works to break down the organic matter in sewage and make it harmless.
- (3) the nitrogen fixing bacteria present in root nodules of leguminous plant convert atmospheric nitrogen gas into nitrogen compound.
- (4) the bacteria that makes curd from milk.

30. Crop rotation is

- (1) the process of transferring seedling from nursery to the main field.
- (2) practice in which leguminous and non-leguminous crops are grown alternately in the same field.

- (3) the process of scattering seeds in the ground soil for growing the crop plants matter into rich humus.
- (4) the process of converting dead organic matter into rich humus.

31. Mixed cropping is

- (1) a method in which two or more crops grow simultaneously on the same piece of land.
- (2) a method in which two or more crops grow simultaneously on the same field in a definite pattern.
- (3) a method in which different crops grow on a piece of land in pre-planned succession.
- (4) a method in which same crops grow on the same field year after year.

32. Apiculture is

- (1) rearing, care and management of honey bees for obtaining products like honey, bee venom, etc.
- (2) rearing, care and management of insects for obtaining products like honey, propolis, etc.
- (3) rearing, care and management of animals for obtaining products like milk, meat, etc.
- (4) rearing, care and management of plants for obtaining products like fruits, vegetables, etc.

Feature Based MCQ

33. On the basis of following features identify correct option.

- (I) It consists of organic matter.
- (II) It is prepared from animal excreta and plant waste.
- (III) It causes no pollution.

- (1) Manure (2) Fertilizer
- (3) Vermi-compost (4) Pesticide

34. On the basis of following features identify correct option.

- (I) It helps in recycling of waste materials.
- (II) It keeps insects, pests and weeds under check.
- (III) It does not cause pollution of crop plants, soil, air and water.

- (1) Vermi-compost (2) Manure
- (3) Organic-farming (4) Fertilizer

35. On the basis of following features identify correct option.

- (I) It helps in absorption of nutrient elements by plants from soil.
- (II) It provides moisture for germination of seeds as seeds do not germinate in dry soils.

- (1) Nutrient management (2) Mineral replenishment
- (3) Irrigation (4) Cropping patterns

36. On the basis of following features identify correct option.

- (I) It is the rearing of domesticated birds – chicken, ducks, geese and turkey, for egg and meat.
- (II) It is the cheapest source of animal protein.

- (1) Poultry farming (2) Cattle farming
- (3) Poultry breeding (4) Cattle breeding

Hints & SOLUTIONS

Exercise 1

1. (1) 2. (2) 3. (4) 4. (2)
5. (4) Increase in food production has been possible by the success of green revolution for food grain and white revolution for milk.
6. (3) Food security depends upon both availability of food and access to it.
7. (4) Sustained livelihood can be achieved by use of mixed farming, Intercropping and integrated farming practices.
8. (1) Cereals such as wheat, rice, and maize provide us carbohydrates for energy requirement.
9. (2) Pulses such as gram, green gram, pigeon pea and lentil provide us proteins for bodybuilding.
10. (4) 11. (4) 12. (3) 13. (3)
14. (2) Vitamins and minerals are provided by vegetable, spices & fruits.
15. (4) Mustard, linseed and peas are grown in rabi season and not in kharif season.
16. (4) The activities for improving crops yields are : crop variety improvement, crop production improvement, crop production management.
17. (4) Hybridization is done to incorporate desirable characteristics into crop varieties. It refers to crossing between genetically dissimilar plants that may be inter varietal or inter specific.
18. (4) Variety improvement is done to get higher yield not only by making it tolerant to high salinity or diverse climatic conditions, but also to increase resistance to biotic or a-biotic stresses. It is helpful in changing the maturity duration and getting desirable agronomic characteristics.
19. (4) 20. (2) 21. (1) 22. (2)
23. (3) There are sixteen nutrients that are essential for plants.
24. (3) Macronutrients available from soil are nitrogen, phosphorus, potassium, calcium, magnesium and sulphur.
25. (4) Manure helps in improving soil fertility and structure by supplying small quantities of nutrients. It is also advantageous in protecting environment from excessive use of fertilizers, recycling farm waste and disposing biological waste.
26. (4) Compost is used in very large quantities, not in little quantities.
27. (2) The practice of mulching specially grown sun hemp or guar by ploughing them into the soil helps in enriching the soil in nitrogen and phosphorus.
28. (2) Fertilizers ensure increased vegetative growth and healthy plants by supplying nitrogen, phosphorus and potassium.
29. (1) 30. (2) 31. (1) 32. (1)
33. (4) Fertilizers should be used carefully because continuous use decreases the soil fertility. They are man-made chemicals and so can be harmful to the micro-organisms present in the soil and also lead to water pollution on getting washed away in rains.
34. (2) Organic farming is a farming system with minimal use of chemicals such as fertilizers, herbicides or pesticides and with a maximum input of organic manures.
35. (1) Use of neem leaves or turmeric during grain storage serves the purpose of bio-pesticides.

36. (2) Mixed cropping is growing two or more crops simultaneously on the same piece of land in a haphazard manner.
37. (2) 38. (1) 39. (4) 40. (4)
41. (4) Insect pests damage the crop by cutting the root, stem and leaf; sucking the cell sap or boring into the stems and fruits.
42. (2) Milk production depends on lactation period of milch animals.
43. (3) Cross breeding programmes between Indian and foreign breeds for variety improvement are focused on number and quality of chicks.
44. (3) Composite fish culture increases the fish yield from a pond by growing a number of fish species in such a way that they don't compete for food, but the problem is that such fish breed only during monsoon and there is lack of availability of good quality seed.
45. (4) 46. (4) 47. (3) 48. (4)
49. (2) The most common activity followed by the farmers to generate additional income is bee keeping.
50. (1) Microorganisms like cyanobacteria are added to fields to increase the N₂ content as they are capable of fixing atmospheric N₂ in the soil.
51. (1) The tremendous increase in the amount of algae and other organic matter in the waters of lakes, ponds, rivers due to the presence of nitrates and phosphate salts (fertilizers), often leading to serious depletion of dissolved oxygen in water is called eutrophication.
52. (3) Leguminous plants like sun hemp are sown in the soil and later ploughed back into the soil at flowering stage.
53. (3) 54. (2)
55. (4) The muddy water if left undisturbed, the mud starts settling down. After the mud has settled, water can be poured in another container to obtain clear water. However some water still remains mixed with mud it can be completely separated by filtration.
56. (2)
57. (3) The work livestock refers to the domestic animals kept or dealt in for use or profit.
58. (1) The pH of honey ranges from 3.4 to 6.1 average being 3.0. So honey is acidic in nature.

Exercise 2

1. (1) 2. (1) 3. (1) 4. (4)
5. (1) 6. (2) 7. (3)
8. (4) Rabi crops are growing in winter season while kharif crops are growing in summer season.
9. (3)
10. (2) A beehive is an enclosed structure in which some honey bee species live and raise their young. The beehive's internal structure is a densely-packed matrix of hexagonal cells made of beeswax, called a honey-comb.
11. (3) 12. (3) 13. (2)
14. (3) Most fish production in inland water body is composite fish culture. Bird flu is a viral disease.
15. (2)

16. (2) Leguminous plants have nodules on their roots containing bacteria which can fix nitrogen contained in the air in to the soil. This nitrogen becomes available to the plant, which uses the nitrogen as an essential part of the proteins of its cells. *E.g. Rhizobium.*

17. (1) Atmospheric nitrogen cannot be used by the plants directly, so bacteria present in the soil break this nitrogen and available for the plants and enrich the soil.

18. (1) If same crop is grown in a piece of land year after year it reduces the fertility of soil because the plants absorb all essential nutrients from the soil for their growth and development.

19. (1)

20. (2) Draught animals are strong and sturdy animals that can undertake strenuous physical work like ploughing and transporting.

21. (2) In super ovulation, more ova can be produced from the ovary by hormonal injection and each embryo is transplanted into a "carrier cow". In embryo transplantation, developing embryo from a pregnant superior breed is removed and transferred into another female with inferior characters.

22. (2) 23. (1)

24. (2) Manure provides a lot of organic matter to the soil which increases water retention capacity in sandy soils and drainage as well as aeration in clayey soils. It also improves the physical characteristics of soil.

25. (2) Intercropping is growing two or more crops simultaneously in different strips or rows in a same field in definite row pattern. Pesticide and weedicide required for each crop can be applied.

26. (1) 27. (2)

28. (3) Pulses do not contain complete protein, other sources of protein are milk, fish, egg. Fish is a rich source of protein.

29. (3) 30. (2) 31. (1) 32. (1)

33. (1) 34. (3) 35. (3) 36. (1)