

## UNIT

## 7

## Economic Biology



## TEXTBOOK EVALUATION

## I. Choose the correct answer.

1. The production and management of fish is called

- a. Pisciculture    b. Sericulture  
c. Aquaculture    d. Monoculture

**Ans: a. Pisciculture**

2. Which one of the following is not an exotic breed of cow?

- a. Jersey    b. Holstein-Friesian  
c. Sahiwal    d. Brown Swiss

**Ans: c. Sahiwal**

3. Which one of the following is an Italian species of honey bee?

- a. *Apis mellifera*    b. *Apis dorsata*  
c. *Apis florae*    d. *Apis cerana*

**Ans: b. *Apis dorsata***

4. Which of the following are Indian cattle?

- i. *Bos indicus*    ii. *Bos domesticus*  
iii. *Bos bubalis*    iv. *Bos vulgaris*  
a. i and ii    b. i and iii  
c. ii and iii    d. iii and iv

**Ans: b. i and iii**

5. Which one of the following is not an Indian major carp?

- a. Rohu    b. Catla  
c. Mrigal    d. Singhara

**Ans: d. Singhara**



6. Drones in the honey bee colony are formed from

- a. unfertilized egg    b. fertilized egg  
c. Parthenogenesis    d. both b and c

**Ans: b. fertilized egg**

7. Which of the following is an high milk yielding variety of cow?

- a. Holstein-Friesian    b. Dorset  
c. Shival    d. Red Sindhi

**Ans: a. Holstein-Friesian**

8. Which one of the following is referred as red worms?

- a. *Eudrilus fetida*    c. *Perionyx excavatus*  
b. *Eudrilus eugeniae*    d. *Lampito mauritii*

**Ans: a. *Eudrilus fetida***

9. Which Indian variety of honey bee is commonly used for apiculture?

- a. *Apis dorsata*    b. *Apis florea*  
c. *Apis mellifera*    d. *Apis indica*

**Ans: d. *Apis indica***

10. Mehsana is a breed of

- a. Cow    b. Buffalo    c. Goat    d. Sheep

**Ans: b. Buffalo**

11. Binomial name of Nilavembu is

- a. *Leucas aspera*    c. *Crotolaria juncea*  
b. *Andrographis paniculata*    d. *Cassia fistula*

**Ans: b. *Andrographis paniculata***

12. \_\_\_\_\_ is the method of growing plants without soil.

- a) Horticulture   b) Hydroponics  
c) Pomology   d) None of these.

**Ans: b) Hydroponics**

13. The symbiotic association of fungi and vascular plants is

- a) Lichen   b) *Rhizobium*  
c) Mycorrhizae   d) *Azotobacter*

**Ans: c) Mycorrhizae**

14. The plant body of mushroom is

- a) Spawn   b) Mycelium  
c) Leaf   d) All of these

**Ans: b) Mycelium**

## II. Fill in the blanks.

1. \_\_\_\_\_ is a nodulating type of micro organism associating symbiotically with the root of legume plants.

**Ans: *Rhizobium* bacteria**

2. Quinine drug is obtained from \_\_\_\_\_.

**Ans: *Chinchona officinalis***

3. *Carica papaya* leaf can cure \_\_\_\_\_ disease.

**Ans: Dengue**

4. *Ganoderma lucidum*, is commonly known as \_\_\_\_\_ mushroom.

**Ans: Lingzhi**

5. \_\_\_\_\_ is the maintenance of bee colonies in modern hives.

**Ans: Worker Bees**

6. Vermicompost is a type of soil made by \_\_\_\_\_ and microorganisms.

**Ans: earthworm**

7. \_\_\_\_\_ refers to the culture of prawns, pearl and edible oysters.

**Ans: Aquaculture**

8. The fertile female in a honey bee hive is \_\_\_\_\_.

**Ans: Queen Bee**

9. \_\_\_\_\_ is a preservative in honey.

**Ans: Formic Acid**

10. \_\_\_\_\_ is the method of culturing different variety of fish in a water body.

**Ans: composite fish culture**

11. Pasturage is related to \_\_\_\_\_.

**Ans: honey production**

## III. State whether true or false, If false, correct the given statement.

1. Medicinal plants contain compounds that can be used for therapeutic purposes.

**Ans: False, Medicinal plants contain chemical compounds that can be used for therapeutic purposes.**

2. Anthraquinones is obtained from *Ocimum sanctum*.

**Ans: False, Anthraquinones is obtained from Aloe vera.**

3. Mycorrhiza is an algae.

**Ans: False, Mycorrhiza is a fungi.**

4. Aquaponics is a technique of growing plants with their root supplied with moisture present in the air.

**Ans: False, Aeroponics is a technique of growing plants with their root supplied with moisture present in the air.**

5. Milch animals are used in agriculture and transport.

**Ans: False, Draught animals are used in agriculture and transport.**

6. *Apis florea* is a rock bee.

**Ans: False, Apis dorsata is a rock bee.**

7. Ongole is an exotic breed of cattle.

**Ans: False, Ongole is an indigenous breed of cattle.**

8. Sheep manure contains high nutrients than farm yard manure.

**Ans: True**

## IV. Match the following.

Column A	Column B
Lobsters	Marine fish
Catla	Pearl
Sea bass	Shell fish
Oysters	Paddy
Pokkali	Fin fish
<i>Pleurotus sps</i>	Psoriasis
Sarpagandha	Oyster mushroom
Olericulture	Reserpine
<i>Wrightia tinctoria</i>	Vegetable farming

Ans:

Column A	Column B
Lobsters	Shell fish
Catla	Fin fish
Sea bass	Marine fish
Oysters	Pearl
Pokkali	Paddy
<i>Pleurotus sps</i>	Oyster mushroom
Sarpagandha	Reserpine
Olericulture	Vegetable farming
<i>Wrightia tinctoria</i>	Psoriasis

## V. Define the following.

## a. Pisciculture

It is the culture and rearing of fishes under controlled conditions.

## b. Apiculture

Apiculture is the rearing of honey bee for honey. It is also called Bee keeping.

## c. Vermiculture

Vermiculture involves the artificial rearing or cultivation of earthworms and using them for the production of compost from natural organic wastes.

## d. Mariculture

Culture of fishes and other aquatic organism in marine water near the sea coast.

## e. Floriculture

Floriculture is the art of cultivation of flowering and ornamental plants in garden for beauty or floristry.

## f. Compost

Compost is a soil conditioner as well as a fertilizer, which is rich in nutrients.

## g. Pomiculture

The cultivation of fruit ,fruit growing technology is called pomiculture.

## h. Pinning

Mycelium starts to form little bud, which will develop into mushroom. Those little white buds are called pins.

## VI. Differentiate the following.

## a. Exotic breed and Indigenous breed

**Exotic breed:**

The exotic breeds (*Bos taurus*) are imported from foreign countries. They include Jersey, Brown Swiss and Holstein-Friesian etc. These foreign breeds are selected for long lactation periods.

**Indigenous breeds:**

Indigenous breeds are native of India. They include Sahiwal, Red Sindhi, Deoni and Gir. These cattle are well built with strong limbs, prominent hump and loose skin. Milk production depends on the duration of the lactation period (the period of milk production after the birth of a calf). These local breed animals show excellent resistant to diseases.

## b. Pollen and Nectar

**Pollen:**

A fine powdery substance ,typically yellow consisting of microscopic grains discharged from the male part of a flower or male cone. Each grain contains a male gamete that can fertilize the female ovule.

**Nectar:**

A sugary fluid secreted within flowers to encourage pollination by insects and other animals, collected by bees to make into honey.

c. Shrimp and Prawn

**Shrimp:**

Penaeid prawns are called shrimps (e.g. *Penaeus indicus*)

**Prawn:**

Non - penaeid prawns are called prawns (e.g. *Palaemon* sps, *Macrobrachium* sps)

d. Fin fish and Shell fish

**Fin fish:**

Fins are usually the most distinctive anatomical feature of fish. they are composed of bony spine.

**Shell fish:**

An aquatic shelled mollusc especially on that is edible. eg. oyster, crab, shrimp

e. Farmyard manure and Sheep manure

**Farmyard manure**

It is a mixture of cattle dung, urine, litter material and other dairy wastes. On an average well decomposed farm yard manure contains 0.5% Nitrogen, 0.2% available phosphate and 0.5% available potash.

**Sheep and Goat manure**

It contains higher nutrients than farm yard manure. It contains 3% Nitrogen, 1% phosphorus pentoxide and 2% potassium oxide.

**VII. Answer in brief.**

1. What are secondary metabolites?

(AYUSH) use drugs obtained from plants and animals. These drugs from medicinal plants are called secondary metabolites.

2. What do you know about AYUSH?

All the major system of medicines such as Ayurveda, Yoga, Unani, Siddha, Homeopathy (AYUSH) use drugs obtained from plants and animals.

3. What are the types of vegetable garden?

Olericulture is the science of growing vegetables. Vegetable farming can be classified into: i) Kitchen or Nutrition gardening ii) Commercial gardening iii) Vegetable forcing.

4. Mention any two mushroom preservation methods.

- (i) Freezing (ii) Drying
- (iii) Canning (iv) Vacuum Cooling
- (v) Gamma radiation and storing at 15°C.

5. Why do we call Haryana and Kankrej breed of cattle as dual purpose breeds?

These breeds provide milk and they are useful for farm work. In India these breeds are favoured by farmers as the cows are fairly good milk yielders and bullocks are good for draught work. They include Haryana, Ongole, Kankrej and Tharparkar.

6. How is division of labour observed in honey bees?

There are three types of individuals in a colony namely the Queen bee, the drones and the worker bees.

**Queen Bee:** The queen is the largest member and the fertile female of the colony.

**Drones:** They are the fertile males.

**Worker Bees:** They are sterile female bees and are the smallest members of the colony.

7. What is the nutritional importance of fish liver oils? Name any two marine fishes which yield these oils.

**Fish oil:** It comprises of liver oil and body oil. Liver oil of Cod, Tuna, Halibut and Shark are of great medicinal value and are rich in vitamin A, D and E.

8. Enumerate the advantages of vermicompost over chemical fertiliser.
- It is a rich source of nutrients essential for plant growth. It makes the soil fertile.
  - It improves soil structure, texture, aeration and water holding capacity and helps to prevent soil erosion.
  - It contains valuable vitamins, enzymes and growth regulator substances for increasing growth, vigour and yield of plants.
  - It enhances decomposition of organic matter in soil.
  - Vermicompost is free from pathogens and toxic elements.
  - Vermicompost is rich in beneficial microflora.
9. What are the species of earthworm used for vermiculture?

Different types of earthworm are living in our soil. Among the vast community of earthworms only very few species can be used for vermicompost production. They are *Perionyx excavatus* (Indian blueworm), *Eisenia fetida* (Red worms), *Eudrilus eugeniae* (African night crawler).

10. List the medicinal importance of honey.

#### Uses of Honey

- Honey has an antiseptic and antibacterial property. It is a blood purifier.
- It helps in building up of haemoglobin content in the blood.
- It is used in Ayurvedic and Unani system of medicines.
- It prevents cough, cold, fever and relieves sore throat.
- It is a remedy for ulcers of tongue, stomach and intestine.
- It enhances digestion and appetite.



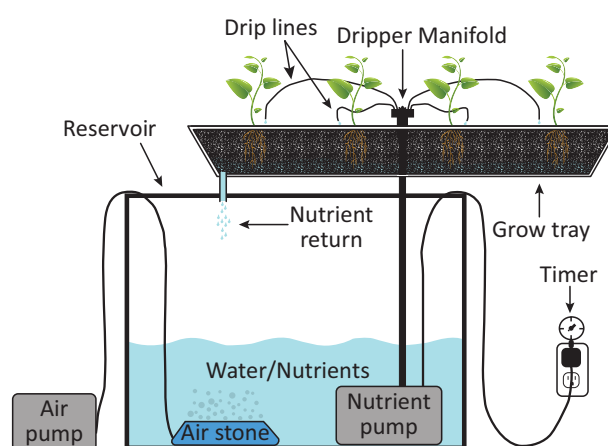
#### VIII. Answer in detail.

1. Enumerate the advantage of hydroponics.

Hydroponics is the method of growing plants without soil, using mineral nutrient solutions in water. The containers are made of glass, metal or plastic. They range in size from small pots for individual plants to huge tank for large scale growing. It was demonstrated by a German Botanist Julius Von Sachs in 1980. Hydroponics is successfully employed for the commercial production of seedless cucumber and tomato. Plants are suspended with their roots submerged in water that contain plant nutrients. The roots absorb water and nutrients, but do not perform the anchoring function. Therefore, the plants must be mechanically supported from above.

#### Importance of hydroponics

- Conservation of water and nutrients.
- Controlled plant growth.
- In deserts and Arctic regions hydroponics can be an effective alternative method.



**Hydroponics**

2. Give an account on medicinal plants.

The history of the medicinal plants is as old as the history of human beings. Most medicines are obtained either directly or indirectly from plants. All the major system of medicines such as Ayurveda, Yoga, Unani, Siddha, Homeopathy (AYUSH) use drugs obtained from plants and animals.



These drugs from medicinal plants are called secondary metabolites. Plants produce primary metabolites for their own living e.g. carbohydrates, amino acids etc., and secondary metabolites for protection, competition and species interaction. e.g. alkaloids, terpenoids, flavonoids etc. Phytochemistry is the study of phytochemicals which are chemical substances derived from various parts of the plant. Few plant derived drugs are described in below:

S. No.	Tamil Name	Botanical Name	Drug	Parts used	Disease cured
1	Katralai	<i>Aloe vera</i>	Anthraquinones	Leaves	Heal wounds, Skin disease, Cancer.
2	Tulsi	<i>Ocimum sanctum</i>	Essential oil	Leaves	Cold, Fever, Skin disease
3	Nannari	<i>Hemidesmus indicus</i>	Terpene	Roots	Bacterial infections, Diarrhoea
4	Nilavembu	<i>Andrographis paniculata</i>	Terpenoids	All parts	Dengue fever, Diabetes, Chikungunya
5	Vepalai	<i>Wrightia tinctoria</i>	Flavonoids	Latex, Leaves	Psoriasis, Diarrhoea, Swellings
6	Cinjona maram	<i>Cinchona officinalis</i>	Quinine	Bark	Malaria, Pneumonia
7	Chivan Amalpodi (Sarpagandha)	<i>Rauwolfia serpentina</i>	Reserpine	Root	Blood pressure, Antidote for Snake bite
8	Thaila maram	<i>Eucalyptus globulus</i>	Essential oil	Leaves	Fever, Headache
9	Pappali	<i>Carica papaya</i>	Papain	Leaf, Seed	Dengue
10	Nithya kalyani	<i>Catharanthus roseus</i>	Alkaloids	All parts	Leukemia, Cancer

3. What are biofertilisers? Give examples. Why are biofertilisers better than other fertilizers.

Biofertilizers are substances that contain living microorganisms which, when applied to seeds, plant surfaces, or soil, colonize the rhizosphere or the interior of the plant and promote growth by increasing the supply or availability of primary nutrients to the host plant.

## Types of Biofertilizers

### Rhizobium

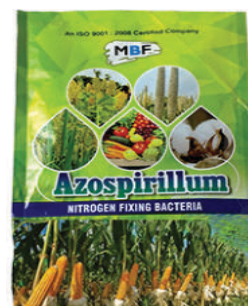
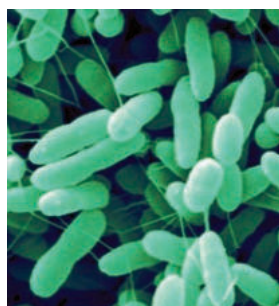
*Rhizobium* is a soil bacterium that colonize the roots of leguminous plants to form root nodules. The bacteria fix atmospheric nitrogen and convert them to ammonia.



*Rhizobium* biofertilizer

### Azospirillum

*Azospirillum* has the ability to use atmospheric nitrogen and transport this nutrient to the crop plants. It is inoculated on maize, barley, oats and sorghum crops. It increases productivity of cereals by 5 - 20%, of millets by 30% and fodder by over 50%.



*Azospirillum* biofertilizer

### Azotobacter

Application of *Azotobacter* has been found to increase yield of wheat, rice, maize and sorghum. Apart from nitrogen fixation, these organisms are capable of producing antifungal and antibacterial compounds.



*Azotobacter* biofertilizer

### Mycorrhizae

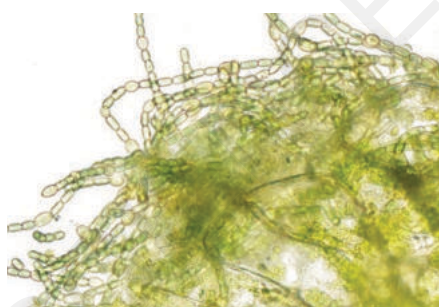
These fungi have symbiotic association with the roots of vascular plants. They increase the uptake of phosphorus. e.g. Citrus, Papaya.



*Mycorrhizae* biofertilizer

### Azolla

*Azolla* is a free floating, aquatic fern found on water surfaces having a cyanobacterial symbiotic association with *Anabaena*. It is a live floating nitrogen factory using energy from photosynthesis to fix atmospheric nitrogen.



*Azolla* biofertilizers

4. Define Mushroom culture. Explain the mushroom cultivation methods.

Mushroom cultivation is a technology of growing mushrooms using plant, animal and industrial waste. In short it is wealth out of waste technology.

### Composting

Compost is prepared by mixing paddy straw with number of organic materials like cow dung and inorganic fertilizers. It is kept at about 50°C for one week.

### Spawning

Spawn is the mushroom seed. It is prepared by growing fungal mycelium in grains under sterile conditions. Spawn is sown on compost.

### Casing

Compost is covered with a thin layer of soil. It gives support to the growing mushroom, provides humidity and helps regulate the temperature.

### Pinning

Mycelium starts to form little bud, which will develop into mushroom. Those little white buds are called pins.

### Harvesting

Mushroom grow better in 15°C - 23°C. They grow 3 cm in a week which is the normal size for harvesting. In the third week the first flush mushroom can be harvested.



Mushrooms

### Preservation

Discolouration, weight, and flavour loss are the main problems of harvesting stage of mushrooms. The following methods are used to increase their life.

- (i) Freezing
- (ii) Drying
- (iii) Canning
- (iv) Vacuum Cooling
- (v) Gamma radiation and storing at 15°C.

5. Write short notes on;

**a) Importance of green houses**

1. Disease-free plants can be produced continuously.
2. Water requirement of crops is very low.
3. Yield is very high compared to outdoor cultivation.
4. Limited pesticide is needed.
5. It protects plants from uncertain weather.

**b) Uzhavan mobile Application**

Government of Tamil Nadu has launched Uzhavan (farmer) mobile application. It can be used by farmers to gather information on farm subsidies, farm equipments, crop insurance and weather conditions. It also provides information on available stock of seeds and fertilizers in local government and private stores.

**c) Major floriculture zones**

**Floriculture Zones of Tamil Nadu**

Zones	Flowers
Hosur Zone	Jasmine, Marigold, <i>Chrysanthemum</i> , Rose
Chennai Zone	Jasmine, <i>Crossandra</i> , Marigold
Madurai Zone	Jasmine, Marigold, Scented rose, <i>Nerium</i> , <i>Crossandra</i>
Trichy Zone	Jasmine, Rose, Scented rose
Coimbatore Zone	Jasmine, Tuber rose, <i>Celosia</i> , Scented rose
Kanyakumari Zone	Jasmine, Scented rose
Hill area Zone	<i>Chrysanthemum</i> , Marigold.

**d) Azospirillum**

*Azospirillum* has the ability to use atmospheric nitrogen and transport this nutrient to the crop plants. It is inoculated on maize, barley, oats and sorghum crops. It increases productivity of cereals by 5 - 20%, of millets by 30% and fodder by over 50%.

6. What are the sources of organic resources for vermicomposting?

Organic manures are predominantly derived from plant debris, animal faeces and microbes. They make the soil fertile by adding nutrients like nitrogen. Few of them are listed below.

**Animal manure**

It consists of faeces and urine from livestock like cattle, horses, pigs, sheep, chickens, turkeys, rabbits, etc. Manures from different animals have different qualities and different applications.

**a. Farmyard manure**

It is a mixture of cattle dung, urine, litter material and other dairy wastes. On an average well decomposed farm yard manure contains 0.5% Nitrogen, 0.2% available phosphate and 0.5% available potash.

**b. Sheep and Goat manure**

It contains higher nutrients than farm yard manure. It contains 3% Nitrogen, 1% phosphorus pentoxide and 2% potassium oxide.

7. Give an account of different types of fish ponds used for rearing fishes.

Fish farm requires different types of pond for the various developmental stages of fish growth. They are:

- Breeding pond:** Healthy and sexually mature male and female fishes are collected and introduced in this pond for breeding. The eggs released by the female are fertilized by the sperm and fertilized eggs float in water as frothy mass.
- Hatchling pits:** The fertilized eggs are transferred to hatching pits for hatching. Two types of hatching pits are hatcheries and hatching hapas.

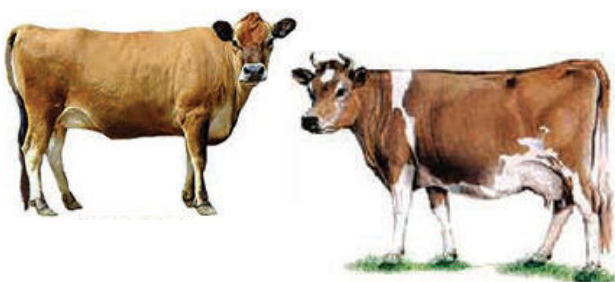


- c) **Nursery ponds:** The hatchlings are transferred from hatching pits after 2 to 7 days. The hatchlings grow into fry and are cultured in these ponds for about 60 days with proper feeding till they reach 2 - 2.5 cm in length.
- d) **Rearing ponds:** Rearing ponds are used to culture the fry. The fish fry are transferred from nursery pond to rearing ponds and are maintained for about three months till they reach 10 to 15 cm in length. In these rearing ponds the fry develops into fingerlings.
- e) **Stocking pond:** The stocking pond is also called as culture pond or production pond. These ponds are used to rear fingerlings upto the marketable size. Before releasing the fingerlings, the pond is manured with organic manure and inorganic fertilizers.
8. Explain the feeding management of dairy cattle.

### Feed Management

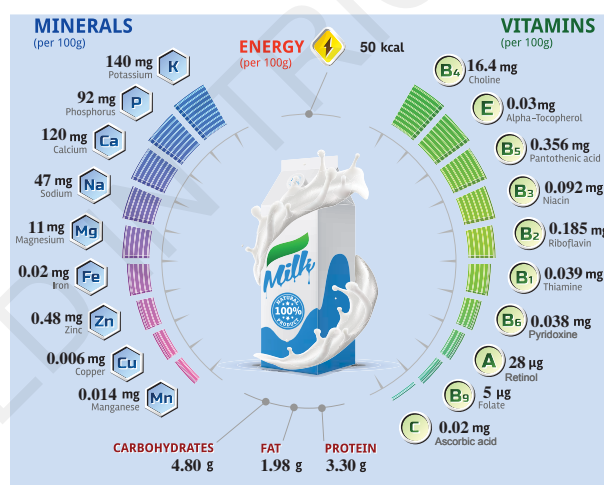
Dairy cattle need balanced rations containing all nutrients in proportional amounts and food additives which contain minerals, vitamins, antibiotics and hormones to promote the growth of animals, good yield of milk and to protect from diseases. The daily average feed ratio of a milking cow is:

- 15-25 kg of roughage (dry grass and green fodder)
- 4-5 kg of grain mixture
- 100-150 litres of water



### Nutritional Information of Cow's Milk

Composition of Milk	Average Quantity per 100ml
Energy	266 kJ
Total Protein	3.4g
Casein	0.7g
Total Fat	0.4g
Saturated Fat	3.4g
Total Carbohydrate	2.3g
Sodium	44mg
Calcium	128mg



### Nutrient contents of milk

9. Classify the different breeds of the cattle with suitable examples.

The Indian cattle include cows and buff loes. They are domesticated for milk, meat, leather and transportation. They belong to two different species, *Bos indicus* (Indian cows and bulls) and *Bos bubalis* (buff loes). These cattle animals are reared for milk and farm labour.

They are classified into three types:

- Dairy breeds
- Draught (or) Draft breeds
- Dual purpose breeds.

### Dairy breeds

Dairy animals are domesticated for obtaining milk. The cows (milk producing females) are high milk yielders (**milch animals**). The dairy breeds may be indigenous breeds (or) exotic breeds.

**Indigenous breeds** are native of India. They include **Sahiwal, Red Sindhi, Deoni** and **Gir**. These cattle are well built with strong limbs, prominent hump and loose skin. Milk production depends on the duration of the lactation period (the period of milk production after the birth of a calf). These local breed animals show excellent resistant to diseases.

The **exotic breeds** (*Bos taurus*) are imported from foreign countries. They include **Jersey, Brown Swiss** and **Holstein-Friesian** etc. These foreign breeds are selected for long lactation periods.

The Indian (local) breeds and foreign breeds can be cross bred to produce animals with both desired qualities.

#### **Draught (or) Draft breeds**

They are used for agricultural work, such as tilling, irrigation and carting. These include **Amritmahal, Kangayam, Umblachery, Malvi, Siri** and **Hallikar** breeds. Bullocks are good draft animals while the cows are poor milk yielders.

#### **Dual purpose breeds**

These breeds provide milk and they are useful for farm work. In India these breeds are favoured by farmers as the cows are fairly good milk yielders and bullocks are good for draught work. They includes **Haryana, Ongole, Kankrej** and **Tharparkar**.

#### **Buffalo breeds**

In India buffaloes are domesticated in great number. They are the main milk producers. The milk production of buffaloes is more than that of cows. **Murrah, Mehsana** and **Surti** are indigenous buffalo breeds which are good milk yielders.

### **IX. Assertion and Reason.**

Direction: In each of the following questions, a statement of Assertion is given and a corresponding statement of Reason is given just below it. Of the statements given below, mark the correct answer as

- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- If both Assertion and Reason are true and Reason is not the correct explanation of Asssertion.
- If Assertion is true but Reason is false.
- If both Assertion and Reason are false.

**1. Assertion:** Hydroponics can be defined as a soilless growing system in which plants grow in water.

**Reason:** If a plant is provided with water, minerals and required nutrients, it will grow well and yield more even in the absence of soil.

**Ans:**

- If both Assertion and Reason are false.

**2. Assertion:** Fish and other varieties of aquatic animals are used as food.

**Reason:** Fish and other varieties of sea food constitute good source of nutrition.

**Ans:**

- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

**3. Assertion:** The production of food from animal sources has increased greatly in the last few decades.

**Reason:** Operation flood and blue revolution production has increased in the recent years.

**Ans:**

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

### X. Thinking Skills

1. Biomanuring plays an important role in agriculture. Justify

Organic manures are predominantly derived from plant debris, animal faeces and microbes. They make the soil fertile by adding nutrients like nitrogen. Few of them are listed below.

a. Farmyard manure

b. Sheep and Goat manure

2. Arun and Akash were given fertilisers and earthworm compost both to be used in the fields. Akash preferred to use earthworm compost. Why he did not select the fertilizers?

Compost is a soil conditioner as well as a fertilizer, which is rich in nutrients. It is produced by natural decomposition of organic matter such as crop residues, animal wastes, food wastes, industrial and municipal wastes by microorganisms under controlled conditions.

Vermicompost is the method of making compost with the use of earthworms, which generally live in soil. They eat biomass and excrete it in digested form. This compost is generally called vermicompost.

3. What is pasturage and how is it related to honey production?

Honey bees are used in the production of honey and bee wax. Honey is the aromatic sweet material and its quality depends upon the flowers available to the bees for nectar and pollen collection.

4. Each bee hive consists of hexagonal cells. Name the material in which the cell is formed and mention the significance of the hexagonal cells.

The comb of the bees is formed mainly by the secretion of the wax glands present in the abdomen of the worker bee. A comb is a vertical sheet of wax with double layer of hexagonal cells. The cells of the comb are of various types.

The **storage cells** contain honey and pollen. They are built in the margin and at the top of the comb.

The **brood cells** contain the young stages of the honey bees and they are built in the centre and the lower part of the comb. The **brood chamber** is divided into three types **Worker chamber**, **Drone chamber** and **Queen chamber** where the larvae developing into worker, drone and queen are reared.

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