

ICSE BIOLOGY-8

CHAPTER 1. Transport of Food and Minerals in Plants

Check Point 1

1. xylem and phloem
2. water
3. diffusion; osmosis
4. active transport
5. ascent of sap
6. increases

Check Point 2

1. large
2. proteins; nucleic
3. Boron
4. Micronutrients

TEST YOURSELF

- A. 1. dilute; concentrated 2. Xylem 3. active transport 4. leaves
5. xylem
- B. 1. Active transport 2. Transpiration pull 3. Osmosis
4. Transpiration 5. Ascent of sap 6. Translocation
- C. 1. Root hairs absorb water and minerals from soil.
2. Xylem vessels conduct water and minerals from roots through stem and branches to the tips of leaves against the force of gravity.
3. Phosphorus takes part in the formation of nucleic acids and nucleoproteins.
- D. 1. Phloem; Phloem conducts prepared food from leaves to rest parts of plant, others take part in absorption of water and minerals from soil.
2. Translocation; It is transport of food, others are due to movement of water.
3. Copper; Copper is a micronutrient, others are macronutrients.
- E. 1. **Diffusion** is the movement of molecules from their higher concentration (amount) to the region of lower concentration without using any energy.
Movement of solvent molecules (water) through a semipermeable membrane from the region of their higher concentration to the region of lower concentration is called **osmosis**.
2. **Diffusion** is the movement of molecules from their higher concentration (amount) to the region of lower concentration without using any energy, whereas **active transport** is transport of molecules and ions against concentration gradient by using energy.
3. **Xylem** transports water and minerals absorbed by the root, upward against the force of gravity, whereas **phloem** transports food manufactured by leaves to various parts of the plant.

4. The essential elements which are required in small quantity by plants are called **micronutrients**. They are iron, manganese, copper, boron, zinc, molybdenum, chlorine and nickel.

On the other hand, those elements which are required in large quantity are called **macronutrients**. They are carbon, hydrogen, nitrogen, oxygen, sulphur, phosphorus, calcium, potassium and magnesium.

- F. 1. In unicellular plants, transport of materials take place by diffusion.
2. following are the adaptations in root hairs for absorption of water:
 - (a) They provide a large surface area for absorption.
 - (b) They are unicellular. Their semipermeable membrane allows water and minerals to enter the cell sap but does not allow to come out.
 - (c) Their cell sap has higher concentration of salt than the water in soil.
 - (d) They have a large vacuole which can absorb much water.
3. Experiment to show that water is absorbed by root hairs:

Take four test tubes and mark them A, B, C and D. Fill water in test tubes A, B and C up to about $\frac{3}{4}$ level and only a little amount of water in test tube D. Fix a cork firmly over the mouth of test tube A and leave it. Take three small-sized young balsam plants with their roots intact. Wash the roots under tap water. Insert them in test tubes B, C and D in a manner that the roots get fully dipped in water in test tubes B and C but remain well above the water in test tube D. In test tube C, add few drops of red ink. Add a few drops of oil like mustard oil in test tubes B and C which would float on the surface and prevents any loss of water by evaporation. Mark the level of water in the four test tubes with a marker and leave the set-up for about 24 hours.

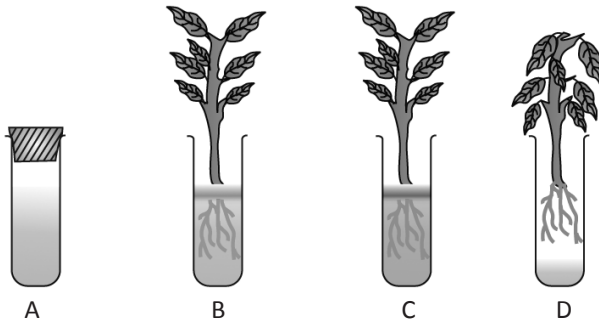
Note the change in the water level in test tubes as follows:

In test tube A: Water level remains unchanged. It is because there was no plant to absorb water and also it was corked. So, there is no loss of water.

In test tube B: Water level falls because water was absorbed by the plant through the roots dipped in water.

In test tube C: Water gets into the plant through the roots and reaches the leaves as the path is seen due to red colour.

In test tube D: There was no change in water level because the roots were not dipped in water.



This shows that water is absorbed by root hairs.

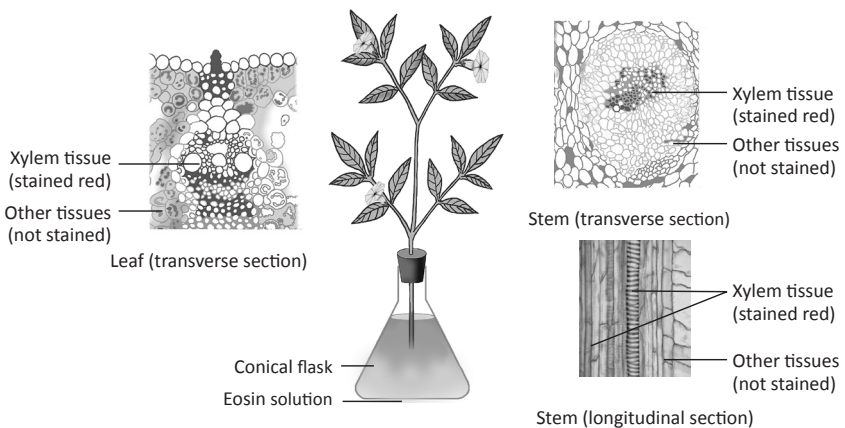
4. Experiment to demonstrate that ascent of sap takes place through xylem vessels:

Take a test tube or a beaker or conical flask filled with water. Put a few drops of eosin solution or red ink in it. Place a twig with white flowers in the conical flask. Leave the setup undisturbed for 2–3 hours.

Observe the colour of veins in flowers and leaves. Cut the stem of the twig lengthwise or vertically and observe what portion of the stem has become coloured. Cut widthwise or transverse section of this stem and one of the leaves. Mount on a clean slide and observe under a microscope.

- Only the xylem vessels are coloured in both the sections of the stem of twig.
- Veins in petals of flowers and that of leaves have become red.

This shows that ascent of sap takes place through xylem vessels.



5. The upward movement of water and minerals from roots to top of plant through xylem vessels against the force of gravity is called ascent of sap.
6. Root pressure is the hydrostatic pressure which develops due to accumulation of minerals in the xylem of roots. It allows water to diffuse into xylem of roots from soil and forces water upward a few meters in the stem and leaves.
7. Events during transport of water from soil to leaves
 - (a) Absorption of water by root hair
 - (b) Cell-to-cell movement of water through cortex of root
 - (c) Ascent of sap or conduction of water through stem to leaves
8. The rate of transpiration is affected by following conditions:
 - (a) Temperature of air increases transpiration.
 - (b) Humidity decreases transpiration.
 - (c) Wind speed increases the rate of transpiration.
 - (d) Light causes stomata to open and thus, increases the rate of transpiration.

G. 1. False; Osmosis and diffusion are **different** phenomena.

2. False; Plants lose water by the process called **transpiration**.

3. False; Root hairs are **unicellular** structures.

4. True

5. True

H. 1. –(d) 2.–(c) 3.–(e) 4.–(b) 5.–(a)

I. 1. Water is lost through transpiration. This creates a pull on the water column in the xylem vessels and hence, more water is pulled upwards.

2. The root pressure which develops inside the xylem of roots provides the initial push to the water molecules and holds the water column up.

3. Light causes stomata to open which in turn increases the rate of transpiration.

4. The cell membrane of root hairs acts as a semipermeable membrane through which water molecules from soil enter the cell sap. Thus, absorption of water occurs by osmosis.

J. 1. (c) 2. (d) 3. (d) 4. (d) 5. (d) 6. (c)

- K. 1.** (a) Transpiration
- (b) So that water lost by transpiration is collected in the form of water drops.
- (c) Transpiration will be at a very slow speed, so water drops will not be visible.
- 2.** Water level in test tube A fell down because water is lost by transpiration from the leaves of plant. In test tube B, no water is lost because there is no plant in it, and hence, the water level remains the same.
- 3.** (a) Diffusion. It is the movement of molecules of a substance from the region of their higher concentration to the region of lower concentration without using energy.
- (b) Larger molecules shown by red colour are solute molecules and smaller molecules of blue colour are solvent molecules.
- (c) There will be free movement of solvent as well as solute molecules through the permeable membrane.

THINK ZONE

- We feel cool on standing under a tree because the tree releases excess of water as water vapour into the atmosphere through stomata by the process of transpiration.
- Plants need mineral elements for their proper growth. As barren land lacks essential mineral elements, plants do not grow well in it.

CHAPTER 2. Reproduction in Plants

Check Point 1

1. two
2. clone
3. fragmentation
4. unfavourable

Check Point 2

1. Tuber
2. Bulb
3. Leaf
4. Explant

Check Point 3

1. True
2. False
3. False
4. True
5. True
6. False

TEST YOURSELF

- A. 1. Flowers 2. anthers 3. reproductive 4. stem cutting 5. Pericarp
6. air 7. ovule
- B. 1. Asexual reproduction
2. Zygote
3. Tissue culture
4. Fertilisation
- C. 1. The individuals which are genetically identical to their parent and to each other are called clone.
2. The individuals produced by the process of hybridisation are called hybrids.
3. The branched underground stem that swells up due to storage of food is called rhizome.
4. Artificial pollination also called hybridisation is the pollination carried out manually between two genetically different plants.
- D. 1. **Budding** is a form of asexual reproduction in which a daughter individual arises on parent organism as a small bud-like outgrowth which after growing detaches from parent and forms a new individual. On the other hand, in **fission**, an individual divides completely into daughter cells.
2. **Unisexual flowers** have either the male reproductive organs or the female reproductive organs, whereas **bisexual flowers** contain both male and female reproductive organs.
3. In **self-pollination**, pollen from the anthers of a flower are carried to the stigma of the same flower or other flower on the same plant, whereas in **cross-pollination**, pollen from the anthers of one flower are carried to the stigma of a flower of some other plant of the same type by air, water or animals.
4. **Explant** is a piece of an actively dividing plant tissue taken for obtaining young cells in tissue culture, whereas **callus** is a mass of undifferentiated plant cells obtained from explant.
- E. 1. Various methods of asexual reproduction in plants are fission, budding, fragmentation and sporulation.
2. In *Rhizopus* – Sporulation
Yeast – Budding
3. Fragmentation is a method of asexual reproduction in which an organism breaks into two or more fragments by some physical force such as wind, water wave or rain and each fragment develops into a new individual, e.g., in *Spirogyra*.

4. Significance of vegetative propagation:
 - (a) Vegetative propagation is a rapid, easier and cheaper method of plant propagation. Such plants also bear flowers and fruits early.
 - (b) The new plants developed by vegetative propagation are exact copies of the parent plant.
 - (c) Plants grown vegetatively usually need less attention in early stages.
 - (d) Plants which do not produce viable seeds, can only be grown vegetatively, e.g., banana, seedless grapes, rose, pineapple and *Dahlia*.
5. Sexual reproduction is a mode of reproduction which takes place by the formation of male and female gametes, and their fusion gives rise to a new individual.
6. Flower is the reproductive organ of a plant. It forms seeds that give rise to new plants on germination.
7. Wheat flowers have following adaptive features for wind pollination:
 - (a) Flowers are dull and do not produce nectar.
 - (b) They produce small, dry and light pollen in large number to be carried away by wind.
 - (c) Stamens have long filaments and are able to swing freely for releasing pollen grains to be carried away by wind.
 - (d) Carpels have 2 or 3 styles with feathery stigma to catch pollen grains.
8. The agents of cross pollination are air, water, birds, insects such as butterflies, moths, bees, wasps and ants, animals such as rodents, snails and mammals (bat, man, etc).
9. Structural modifications in insect-pollinated flowers:
 - (a) The insect-pollinated flowers have nectaries that produce nectar.
 - (b) They have sweet smell and bright colours.
 - (c) They have sticky stigma and sticky pollen grains.
 - (d) They have large and loosely attached anthers.
 - (e) Their stigmas hang out of the flowers to trap the pollen grains.
10. Advantages of self-pollination:
 - (a) Self-pollinated flowers need not be scented or brightly coloured.
 - (b) They need not to produce a large number of pollen grains.
 - (c) There is no need of pollinating agents.
 - (d) The new plants formed are always identical to their parents.

Disadvantages of self-pollination:

- (a) New varieties are not produced.
- (b) Disease resistance of plants decreases.

F. 1.-(c) 2.-(e) 3.-(b) 4.-(d) 5.-(a)

G. 1. False; Grape plants are grown by **stem cutting**.

2. False; Spores are **thick**-walled asexual bodies formed during **unfavourable** condition.

3. True

4. True

5. False; After pollination ovary develops into a **fruit**.

6. True

H. 1. Pollen; It is the male reproductive part, others are female reproductive parts.

2. Pollen; It is male reproductive part, others are female reproductive parts.

3. Grafting; It is a method of vegetative propagation, others are methods of asexual reproduction.

4. Tomato; It is a fruit, others are underground stems.

I. 1. Daughter cells in yeast develop by budding from the parent cell and do not separate. Even the daughter cells attached to parent cell also start budding. Thus, they form a long chain.

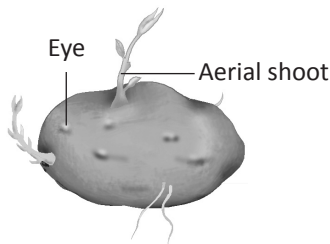
2. Insect-pollinated flowers are brightly coloured or scented to attract insects for pollination.

3. Wind-pollinated flowers produce large amount of pollen grains to ensure that pollen grains reach the stigma of female flowers.

4. Spores have hard covering to withstand unfavourable conditions of environment like high temperature or drought.

J. 1.-(a) 2.-(b) 3.-(b) 4.-(b) 5.-(a)

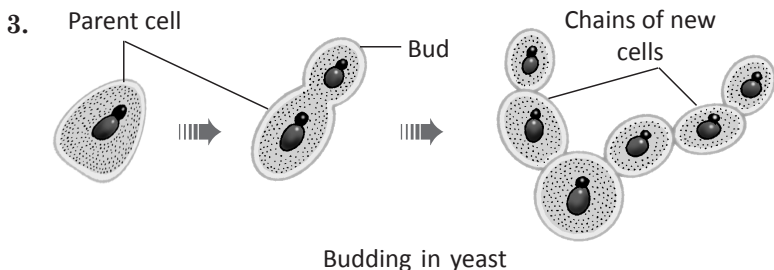
K. 1.



(a) Potato is a modified underground stem called tuber.

(b) It is swollen because of food stored in it.

(c) Each eye in a potato grows into a new plant.



THINK ZONE

- The spores of mould are always present in air. On coming in contact with the moist slice of bread, they get nutrients and suitable conditions of temperature and moisture and germinate.
- The scent of flowers attracts insects. Therefore, it is pollinated by insects at night.

CHAPTER 3. Reproduction in Animals

Check Point

1. Testis 2. Ovary 3. Uterus or womb 4. Implantation 5. Placenta

TEST YOURSELF

A. 1. *Amoeba* 2. gametes 3. ova

B. 1. Fertilisation 2. Testis 3. Placenta

C. 1.

Asexual reproduction	Sexual reproduction
1. A single organism divides and produces two or more offspring.	1. Male and female individuals form gametes which fuse to give rise to a new individual.
2. Only one parent is needed.	2. Both male and female parents are needed.
3. Asexual reproduction may occur by binary fission, multiple fission, sporulation and budding.	3. Sexual reproduction occurs by the formation of gametes.
4. Offspring are genetically identical to the parent and are called clone.	4. Offspring are similar but not genetically identical to parents.

2.

Oviparous animals	Viviparous animals
● Oviparous animals lay eggs. Examples: Insects, fishes, frogs, reptiles and birds.	● Viviparous animals give birth to young ones. Examples: Cat, dog, horse, human being, etc.

- D. 1.** The process of release of mature ovum from ovary is called ovulation.
- 2.** The expelling of semen from the penis is called ejaculation.
- 3.** The full term of development of baby in the womb of female is called gestation period.
- E. 1.** Sexual reproduction involves the following important events:
- (a) **Gametogenesis:** It is the formation of male gametes (sperm) and female gametes (ova).
- (b) **Fertilisation:** It is the fusion of male and female gametes and formation of zygote.
- (c) **Embryogenesis:** It is the formation of embryo from developing zygote.
- (d) **Development:** It is the growth of embryo into an adult.
- 2.** In human beings, the process of fertilisation occurs in the anterior part of oviduct and zygote is formed.
- 3.** The organs of female reproductive system are ovaries, oviducts or fallopian tubes, uterus and vagina.
- 4.** The attachment of embryo to the wall of uterus by placenta is called implantation.
- F. 1.** False; The first cell of a living organism is **zygote**.
- 2.** True
- 3.** False; The unfertilised egg is called **ovum**. (Or The **fertilised** egg is called zygote).
- G. 1.** Sperm duct; It is a part of male reproductive system, others are parts of female reproductive system.
- 2.** Vagina; It is a part of female reproductive system, others are parts of male reproductive system.
- 3.** Ovary; It is an organ, others are cells.
- 4.** Semen; It is a fluid secreted from male reproductive system, others are sex hormones.
- H. 1.** Testes in mammals are located outside the abdomen to keep their temperature below the normal body temperature because the maturation of sperm requires a temperature 3°C below the body temperature.
- 2.** In human beings, the embryo at two-month stage, starts resembling the human form and therefore, it is called foetus.
- I. 1.**–(d) **2.**–(a) **3.**–(b) **4.**–(c)
- J. 1.** Testes produce male gametes called sperm and male sex hormone testosterone.
- 2.** Fallopian tubes are the site of fertilisation. They transport unfertilised or fertilised ovum towards uterus.
- 3.** Seminal vesicles contribute in the formation of fluid part of semen.

4. Placenta attaches embryo to the wall of uterus and provides support, nutrients and oxygen to the foetus from mother's blood. It also removes CO_2 and excretory products from foetus and releases them into maternal blood stream.

K. 1. Testes 2. Fallopian tubes 3. Uterus 4. Vagina

L. 1. (b) 2. (d) 3. (b) 4. (c)

M. 1. (a) 1. Urinary bladder 2. Sperm duct or vas deferens

3. Epididymis 4. Testis 5. Penis 6. Bulbourethral gland

(b) Vas deferens brings mature sperm from epididymis into the urethra prior to ejaculation.

(c) Testes secrete male hormone testosterone.

(d) Maturation and storage of sperm.

2. (a) 1. Placenta 2. Uterus 3. Cervix 4. Foetus

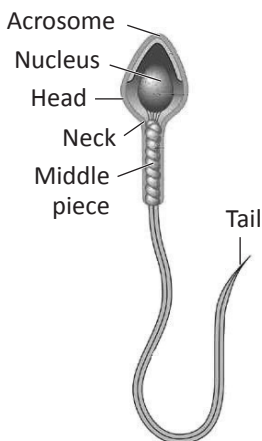
(b) Placenta attaches embryo to the wall of uterus and provides support, nutrients and oxygen to the foetus from mother's blood and removes CO_2 and excretory products from foetus and releases them into maternal blood stream.

(c) (i) The uterine wall has become highly vascular.

(ii) It is thrown into villi for making intimate contact with placental villi.

(d) The foetus remains in uterus for 280 days.

3. A mature human sperm is shown below:



THINK ZONE

In human beings, embryo gets attached to the uterine wall to obtain nutrients and oxygen from mother's blood through placenta and to expel CO_2 and excretory products into the mother's blood till its birth.

CHAPTER 4. Ecosystem

Check Point 1

1. True
2. False
3. True
4. False
5. True

Check Point 2

1. sun
2. secondary
3. food chain
4. interconnected; food web
5. pyramids

Check Point 3

1. lichen
2. endo
3. sun
4. Humidity
5. canopy

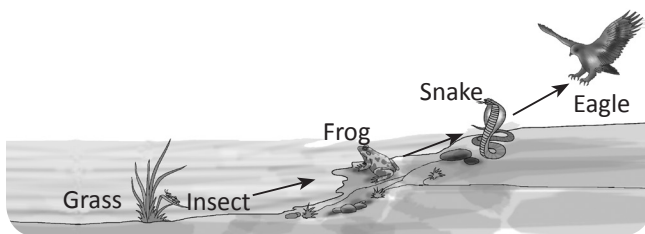
TEST YOURSELF

- A. 1. abiotic 2. green; photosynthetic bacteria 3. decomposers
4. recycling 5. secondary
- B. 1. Symbiosis 2. Food chain 3. Transformers 4. Food chain
5. Ecosystem 6. Food chain 7. Pyramid of number
- C. 1. Parasitism is a negative interaction between organisms of two species in which one organism (usually smaller) lives on or within the body of another organism (larger one) and obtains food and shelter from it. The smaller organism is always benefitted and is called parasite, whereas the larger one which is always harmed or gets no benefit is called host.
2. Primary consumers are the animals which feed upon plants or plant products. They are called herbivores.
3. Scavengers are the animals which feed upon dead animals and left over food by the carnivores.
4. An ecosystem is a community of living organisms in a given area or in a habitat, interacting with each other and with their nonliving environment (weather, sun, water, soil, climate and atmosphere).
- D. 1. Grass → Insects → Frog → Snake → Eagle
2. Grains → Rat → Owl
3. Grass → Goat → Lion
- E. 1. An ecosystem is a community of living organisms in a given area or in a habitat, interacting with each other and with their nonliving environment. It is an open system which requires continuous input of energy and circulation of material for the sustenance between its biotic and abiotic components.
2. The primary source of energy in the ecosystem is the sun.

3. Sunlight, temperature, pressure, humidity and wind are climatic factors of abiotic ecological component.
4. The association of deer and tiger is called predator-prey association.
5. Herbivorous consumers form the second trophic level in the food chain.
6. Plants are called producers because they produce food for themselves and for all other members of ecosystem by capturing the energy of the sun during photosynthesis and converting it into organic food.
7. Deer and rabbit are primary consumers.
8. Two types of food chains are terrestrial food chain and aquatic food chain:

(a) In a terrestrial food chain,

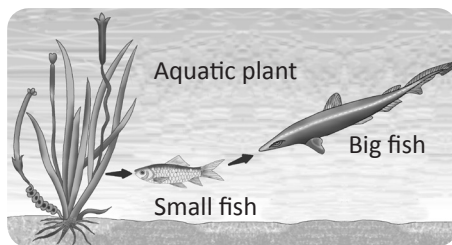
- Producers are green plants such as trees, grasses, herbs, etc.
- Primary consumers are herbivores– plant-eating insects, rabbits, etc.
- Secondary consumers are carnivores– Frog, cat, dog, fox, wolf, etc.
- Tertiary consumers are carnivores– Snakes, etc.
- Top consumers are also carnivores– Eagle, lion, etc.



A terrestrial food chain

(b) In an aquatic food chain,

- Producers are aquatic plants– *Vallisneria*, *Hydrilla*, etc.
- Primary consumers are herbivores– Small fishes
- Secondary consumers are carnivores– Big fishes



An aquatic food chain

9. Animals are called consumers because they cannot prepare their own food. They eat plants, plant products or other animals as food.

Consumers are categorised on the basis of the type of food they eat.

- Herbivores—Also called primary consumers, they feed on plants, e.g., deer, cow, etc.

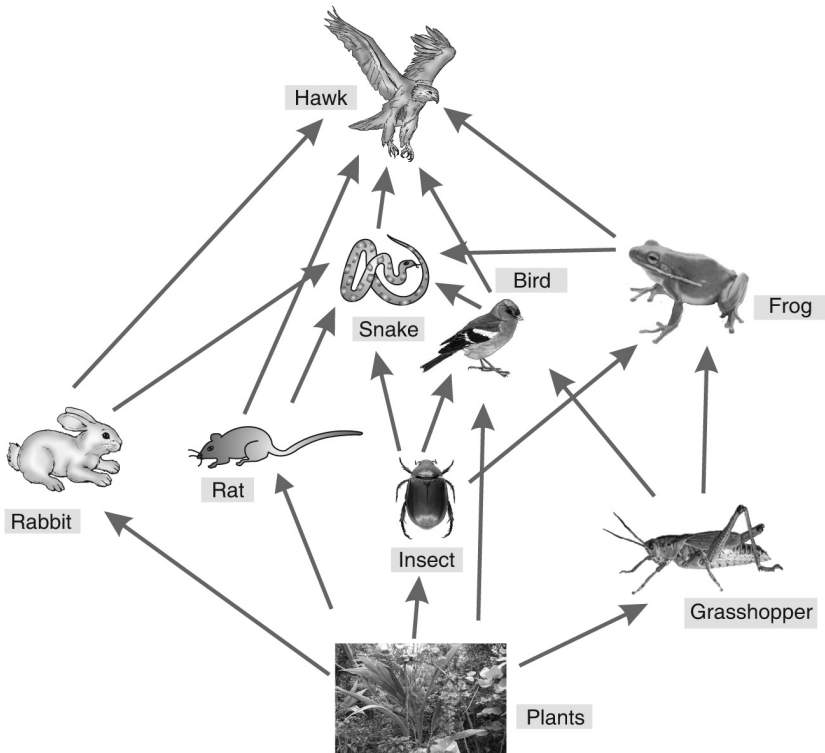
- Carnivores—Also called secondary consumers, they prey upon herbivorous animals, e.g., lion, tiger, wolf, etc.

Carnivores that prey upon other carnivores are called tertiary consumers, e.g., snake.

- Omnivores—They feed on both plants and animals, e.g., man, crow, bear, etc.

10. Decomposers break down the bodies of dead and decaying organisms and release nutrients into the environment. These nutrients are reused by the plants. In this way, they help in the recycling of nutrients in nature.

11. Food web in a forest



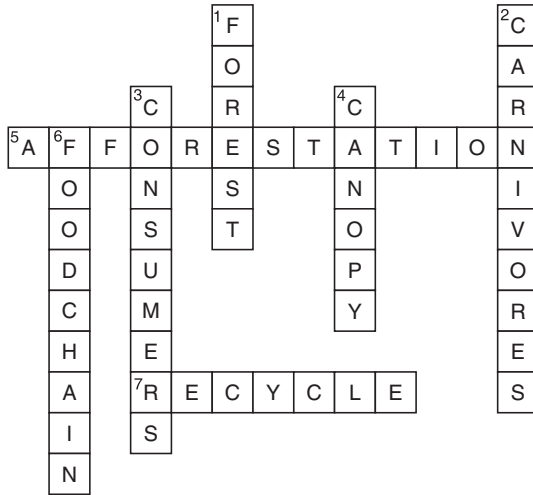
12. Plants are essential for animals for following reasons:
- Animals obtain food from plants.
 - Animals obtain oxygen from plants for respiration.
 - Animals get shade and protection from trees.
 - Plants clean our atmosphere by utilizing CO_2 and releasing oxygen.
 - Plants help in recycling of matter by obtaining nutrients from dead and decaying matter and decaying excreta of animals.
- F. 1. False; Conservation of forests **is required** to maintain balance in nature.
- False; **Biotic** components include plants and animals.
 - True
 - False; Plants are **producers** because they **produce food by trapping solar energy**.
 - True
 - True
- G. 1. (d) 2. (a) 3. (f) 4. (e) 5. (b) 6. (c)
- H. 1. **Decomposers** are the microorganisms which break down complex organic compounds from the dead and decaying remains of plants and animals into simple inorganic substance, whereas **scavengers** are the animals which feed upon dead animals and left over food by the carnivores.
- A **food chain** is an unidirectional flow of energy in the form of food from one organism to another, whereas a **food web** is a network of several interlinked food chains.
 - Herbivore** is an animal which feeds on green plants and their parts, e.g., cow, elephant, deer, rabbit, etc., whereas **carnivore** is an animal which eats other animals, e.g., lion, tiger, wolf, etc.
 - Predation** is an interaction between organisms of two species in which one organism called predator hunts and feeds on the other organism called prey, whereas in **parasitism**, one organism called parasite lives on or in the body of other organism called host and gets benefit from it.
 - The organisms which produce food themselves are called **producers**, e.g., green plants and photosynthetic bacteria, whereas the organisms which depend directly or indirectly on producers for food are called **consumers**, e.g., all animals and nongreen plants.
 - Primary consumers** are herbivores which feed on plants and plant parts, e.g., a cow eats grass.

Secondary consumers are the carnivores which feed on herbivores, e.g., a frog eats an insect.

Tertiary consumers are the carnivores which prey upon secondary consumers, e.g., a snake eats a frog.

- I. 1. (d) 2. (d) 3. (a) 4. (b) 5. (c) 6. (a) 7. (c)

J.



THINK ZONE

If the decomposers are destroyed from the forest, the decomposition of waste and dead matter will not take place. It will accumulate and forest would get converted into a heap of dead and waste matter.

CHAPTER 5. Endocrine System

Check Point 1

1. Pituitary gland
2. Endocrine glands
3. Adrenaline
4. Corticoid (=Cortical) hormones

Check Point 2

1. True 2. True 3. False 4. False 5. True

TEST YOURSELF

- A. 1. endocrine system/hormones 2. chemical 3. endocrine glands
4. Islets of Langerhans 5. pituitary 6. thyroid

- B. 1. Hormones 2. Cretinism 3. Pituitary gland 4. Adrenaline
5. Adolescence 6. Estrogen**
- C. 1. Glands without ducts that pour their secretion directly into the blood are called endocrine glands.**
2. Hormones are also called chemical messenger because they bring about chemical coordination by circulating throughout the body and influencing the functioning of their target organs.
3. The hormones which control the activities of other endocrine glands are called tropic hormones. They are secreted by pituitary gland.
4. Stress is a state of mental or emotional strain and is the feeling of being under pressure. It causes the release of certain hormones which make heart to beat faster, breathe faster and provide burst of energy to react.
5. Puberty is the period during adolescence when a boy or girl becomes sexually mature and capable of reproduction.
6. Adolescence is the period of growth and physical differentiation in boys and girls. It begins around the age of 11–12 years and lasts up to 18–19 years of age.
- D. 1. The glands which pour their secretions directly into the blood are called **endocrine glands**, whereas the glands which pour their secretions into some cavity through their ducts are called **exocrine glands**.**
2. **Hyposecretion of thyroxine** in childhood causes cretinism and in adults, causes myxoedema and simple goitre. On the other hand, **hypersecretion of thyroxine** causes increased metabolism, faster heartbeat, increased pulse rate, restlessness, nervousness and bulging eyes.
3. The coordination in the functioning of body organs by means of hormones secreted by endocrine glands is called **chemical coordination**. On the other hand, coordination by means of nerve impulses is called **neural coordination**.
- E. 1. False; Pituitary gland is called master gland of the body because it **controls functioning of all other endocrine glands of the body**.**
2. False; Hormone thyroxine is secreted by **thyroid** gland.
3. True
4. True
5. True
6. False; Emotional stability is attained during **adulthood**.

F. 1. Thyroxine

2. Insulin and Glucagon

3. Corticoids

4. Oxytocin, vasopressin

G. 1. (a) Glucagon (b) Adrenaline (c) Vasopressin (ADH)
(d) Oxytocin

2. Adrenal glands are located on the top of kidneys like a cap.

3. The hypoactivity of thyroid gland during childhood leads to cretinism, whereas in adults, it leads to myxoedema and goitre.

4. (a) Hyposecretion of Growth hormone

(b) Hyposecretion of Vasopressin

(c) Hyposecretion of Thyroxine

(d) Hypersecretion of Corticoids

5. Pituitary gland is called the master gland because its hormones regulate the functioning of all the other endocrine glands of the body.

6. The external features in which boys and girls differ from each other are called secondary sexual characters. For example, presence of beard and moustaches in boys, breasts in girls, etc. Secondary sexual characters appear during adolescence by the activity of sex hormones.

7.

	Gland	Hormone	Effect
1.	Pancreas	Insulin	Lowers glucose level in blood
2.	Thyroid	Thyroxine	On general metabolism
3.	Pituitary	Growth hormone	Essential for normal growth
4.	Pancreas	Glucagon	Conversion of glycogen into glucose

H. 1. -(c) 2.-(e) 3.-(d) 4.-(a) 5.-(b)

I. 1. (a) 2. (b) 3. (c) 4. (b) 5. (a) 6. (c) 7. (c) 8. (a)

THINK ZONE

- During adolescence, the voice box in boys grows and protrudes out. This develops hoarse voice in boys.
- Adolescents are called teenagers because adolescent period covers the teens, i.e., 13 to 18 or 19 years of age.

CHAPTER 6. Circulatory System

Check Point 1

1. Stethoscope
2. Pulmonary aorta and aorta
3. Systole and diastole
4. Tricuspid valve
5. William Harvey
6. Pulmonary circulation

Check Point 2

1. False
2. True
3. True
4. False
5. False

Check Point 3

1. Palpitation
2. hypertension
3. lymphatics
4. Lacteal

TEST YOURSELF

- A. 1. 140/90; hypertension 2. Sphygmomanometer 3. Pulmonary
4. Arteries 5. Karl Landsteiner 6. capillaries 7. blood transfusion
- B. 1. Cuspid valves 2. Cardiac arrest 3. Left auricle
4. Pulmonary arteries 5. Inferior vena cava
6. Sino-atrial or sino-auricular (SAN) node or SA node (pacemaker)
7. Antigen A and Antigen B
- C. 1. Contraction and relaxation of heart chambers that occur during one heartbeat from a cardiac cycle.
2. The rhythmic contraction and relaxation of auricles and ventricles is termed as heartbeat.
3. Glycoprotein present on the surface of RBC is called antigen.
4. Gamma globulin proteins present in blood plasma are called antibodies.
5. The circulation of blood twice through the heart in one cardiac cycle is called double circulation.
6. A condition in which blood pressure in arteries remains above 140/90 mm Hg on the regular basis is called hypertension.
- D. 1. True
2. True
3. False; Impure blood from different parts of the body returns to the **right** auricle.
4. False; Valves in the veins open on **one side only**.
5. False; Heart is enclosed in a thin pericardium formed of **two** pericardial membranes.
6. True
- E. 1. -(e) 2. -(a) 3. -(f) 4. -(b) 5. -(c) 6. -(d)

F. 1. Differences between Artery and Vein

Artery	Vein
1. Artery is thick-walled blood vessel with narrow lumen (cavity).	Vein is thin-walled blood vessel with wide lumen.
2. It does not have valves.	It has valves to prevent backflow of blood.
3. Through artery, blood flows from heart to other body parts.	Through vein, blood flows from body organs to the heart.
4. Supplies blood from heart to body organs.	Collects blood from body organs and brings it back to heart.
5. Carries oxygenated blood (except pulmonary arteries).	Carries deoxygenated blood (except pulmonary veins).

2. The blood which contains more oxygen to be supplied to the body cells is called **oxygenated** blood, whereas the blood which contains less oxygen and more carbon dioxide is called **deoxygenated** blood.
3. A person with blood group O is called **universal donor**, whereas a person with blood group AB is called **universal acceptor**.
4. **Cardiac arrest** is sudden failure of heart to pump blood while **heart attack** is the decrease in the blood supply to heart muscles by coronary artery due to clotting or blockage in it.
5. The pressure exerted by blood on the wall of arteries when ventricles contract and pump blood into the arteries is called **systolic pressure**. It is 120 mm Hg. On the other hand, the pressure of blood in arteries when ventricles relax is called **diastolic pressure**. It is 80 mm Hg.

- G. 1.** Vena cava; It is the largest vein, others are chambers of the heart.
2. Phloem vessels; They are conducting vessels found in plants, others are blood vessels found in animals.
 3. Urine; It is an excretory waste, others are parts of circulatory system.

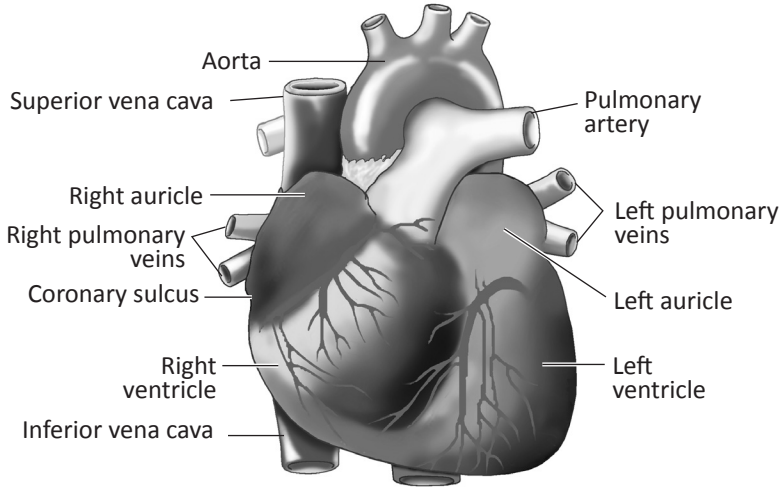
- H. 1.** As ventricles pump blood into blood vessels with force, they need thick and muscular walls.
2. Valves are found at the opening of auricles into ventricles to prevent backflow of blood from ventricles into the auricles when ventricles contract to pump blood into aortas.
 3. Arteries have thick walls to withstand high blood pressure with which the blood flows through them.

4. In arteries, blood flows under pressure but in veins, it flows passively from body to heart. So, to prevent backward flow of blood, valves are present in veins.
 5. Persons of blood group O are universal donors because their red blood cells have no antigens to react with the recipient's antibodies. Due to which blood of group O can be given to any other blood group.
- I.
1. The pumping chambers of the heart are called ventricles.
 2. Left half of human heart has oxygenated blood.
 3. Lymph is called filtered blood because it is without blood proteins and RBCs.
 4. The complete separation of oxygenated and deoxygenated blood in human heart resulted in two independent circulations which are pulmonary and systemic circulations. Due to this reason, supply of oxygen to body cells has become more efficient.
 5. The blood is oxygenated in lungs.
 6. The pericardial fluid is found in the space between the two pericardial membranes of pericardium. It prevents friction between pericardial membranes which protect heart from injury.
 7. Cuspid valves guard the opening of auricles into their respective ventricles and prevent the backflow of blood from ventricles into auricles.
 8. The circulation of blood twice through the heart in one cardiac cycle is called double circulation. It includes two independent circulations which are pulmonary and systemic circulations.
9. (a) **Blood vessels bringing blood to heart**
- (i) Anterior or superior vena cava (or precaval) bring deoxygenated blood from head and upper parts of the body to the right auricle.
 - (ii) Posterior or inferior vena cava or postcaval brings deoxygenated blood from lower parts of the body to the right auricle.
 - (iii) Two pairs of pulmonary veins bring oxygenated blood from lungs to left auricle.
- (b) **Blood vessels carrying blood away from heart**
- (i) Pulmonary aorta carries deoxygenated blood from right ventricle to lungs.
 - (ii) Aorta carries oxygenated blood from left ventricle to various parts of the body.

10. Following are the risk factors of cardiac arrest:

- Family history
- Smoking
- Use of drugs
- Overweight
- High blood pressure
- High blood cholesterol
- Diabetes

11. The structure of human heart is shown below.



J. 1. (d) 2. (b) 3. (a) 4. (c) 5. (b) 6. (b) 7. (a)

CHAPTER 7. Nervous System

Check Point

1. True 2. False 3. True 4. False 5. True 6. False

TEST YOURSELF

- A. 1. nervous, endocrine 2. cerebrum 3. neuron 4. skin
- B. 1. Medulla oblongata 2. Gray matter 3. Sensory fibres
4. Reflex action 5. Cerebral hemispheres 6. Cranial nerves
7. Cerebellum 8. Mixed nerve 9. Medulla oblongata 10. Axon
- C. 1. Stimulus is any change in the environment of an organism that evokes a response in the body.
2. Receptors are nerve cells or sensory cells that are stimulated by changes in the surroundings and generate sensory nerve impulse.
3. Neuron is the structural and functional unit of nervous system.
4. Synapse is a point of contact between terminal branches of axon and dendrites of adjacent neuron.

5. Myelin sheath is a spirally-coiled insulating sheath of fatty substance formed by the Schwann cells around the axon.
6. A sudden and quick response to a stimulus without thinking is called reflex action.

D. 1.

Cerebrum	Cerebellum
1. It is the largest and the most highly developed part of the brain.	1. It is much smaller than cerebrum and is called little brain.
2. It is the seat of intelligence, memory, thinking, learning, instincts, feelings, etc.	2. It coordinates voluntary movements and balance of the body during walking, swimming, jumping, etc.

2.

Gray matter	White matter
1. Gray matter is grayish in colour.	1. White matter is glistening white in colour.
2. Gray matter forms the outer layer of brain and is centrally located in H-shaped region in spinal cord.	2. White matter forms the inner layer of brain and the peripheral layer in spinal cord.
3. Gray matter is mainly formed of cell bodies of neurons.	3. White matter is formed of axons which join to form nerves.

3.

Sensory nerve	Motor nerve
1. Sensory nerves are formed of sensory nerve fibres.	1. Motor nerves are formed of motor nerve fibres.
2. Sensory nerve brings sensory impulses or stimuli from sense organs or receptors to the brain and spinal cord.	2. Motor nerves carry impulses from brain and spinal cord to the effector organ.

3.

Voluntary action	Reflex action
Voluntary action is a response to a stimulus under the control of cerebrum.	Reflex action is a sudden and quick response to a stimulus without thinking.

- E. 1. Following are the three functions of brain:
- (a) Brain controls reasoning, thinking, learning, memorising, breathing, etc.
 - (b) It is responsible for sensory perception of sight, hearing, taste, smell, pain, pressure, etc.
 - (c) It coordinates the voluntary movements of the body.

2. Nerves are the bundles of nerve fibres wrapped in a sheath of connective tissue. They conduct nerve impulses from sense organs to brain and spinal cord, and from brain and spinal cord to effector organs.
3. The types of nerves based on impulses they conduct are:
 - (a) **Sensory nerves:** They conduct impulses from sense organs to brain or spinal cord.
 - (b) **Motor nerves:** They conduct impulses from brain or spinal cord to effector organs like muscles or glands.
 - (c) **Mixed nerves:** They conduct sensory as well as motor impulses.
4. Reflex arc consists of
 - (a) Receptors
 - (b) Sensory nerve fibres
 - (c) Interneurons
 - (d) Motor nerve fibres
 - (e) Effector organ
5. Cerebrum controls reasoning, thinking, learning, memory, etc. It is also responsible for sensory perceptions such as hearing, sight, taste, smell, pain, touch, etc.
6. Reflex action is an automatic response to any stimulus without thinking. For example, when our finger touches a hot object, we withdraw our finger (hand) immediately.

The path of impulse during reflex action is as follows:

Stimulus → Receptor or Sense organ → Sensory neurons →
Interneurons → Motor neurons → Effector organ

- F. 1.** –(b) **2.** –(a) **3.** –(d) **4.** –(e) **5.** –(c)
- G. 1.** False; Cranial nerves are **12** pairs of nerves in human beings.
2. False; All voluntary actions are controlled by **the brain**.
3. True
4. False; Spinal cord is part of **central** nervous system.
5. False; Gray matter is formed of **cyton** or **cell bodies** of nerve cells.
6. False; Response to a stimulus is reflected by an **effector**.
- H. 1.** Receptor; It refers to a sensory neuron or a sense organ, others are parts of a neuron.
2. Axon; It is a part of neuron, others are parts of brain.
3. Breathing; It is an involuntary action, others are reflex actions.

- I. 1. Medulla oblongata regulates breathing movements. So, injury to medulla leads to immediate death.
2. As a result of reflex action, the hand moves away to avoid the pinch.
3. Salivation on seeing tasty food is a reflex action in which we respond unconsciously. Here, food is the stimulus which evokes the reflex, i.e., salivation. Therefore, we salivate on seeing tasty food.
- J. 1. (c) 2. (d) 3. (b) 4. (b) 5. (a) 6. (a) 7. (a)

THINK ZONE

- A drunk person walks clumsily because of the effect of alcohol. Due to alcohol, cerebellum is unable to coordinate the movements of voluntary muscles. This leads to uncoordinated movements and produces jittery gait.
- Hanging causes injury to medulla which regulates breathing movements and beating of heart. As a result, the involuntary actions of breathing and heartbeat are stopped causing instantaneous death.

CHAPTER 8. Health and Hygiene

Check Point 1

1. Pathogens or germs
2. Communicable or infectious diseases
3. Dengue
4. HIV (Human Immunodeficiency Virus)
5. Chloroquine

Check Point 2

1. to trap dust particles and microbes from inhaled air.
2. lymphocytes.
3. Bacillus of Calmette-Guérin.
4. the toxins made harmless but retain the capacity to produce antitoxins and cannot produce the disease.

Check Point 3

1. tobacco; oral
2. Fractured leg
3. Blisters
4. Antihistamine

TEST YOURSELF

- A. 1. measles
2. pathogens or germs

3. Vaccine
4. vector
5. air-borne
6. antibodies

B. 1. Salk vaccine

2. Communicable or Infectious diseases
3. MMR Vaccine (**Hint:** Rubella is also called German measles).
4. Narcotic or psychotropic drugs
5. HIV (Human Immunodeficiency Virus)

C. 1. Immunity is the power provided by the immune system of the body to resist and overcome infections.

2. Pathogens are disease-causing microorganisms.
3. Vector is an animal which transmits pathogens from one host to another.
4. Immunisation is the vaccination at community level (large-scale vaccination) to eradicate a certain disease.
5. Vaccination is the introduction of a vaccine into the body of a person to develop resistance to a particular disease.
6. Antibodies are a type of proteins called immunoglobulins made by the body to destroy the antigens of pathogens.

D. 1.

Communicable diseases	Noncommunicable diseases
1. Communicable diseases spread from diseased persons to healthy ones.	1. Noncommunicable diseases do not spread from patient to healthy person.
2. These are also called infectious diseases or contagious diseases.	2. These are also called noninfectious diseases.
3. These are caused due to infection with microorganisms (viruses, bacteria, fungi, protozoa and worms).	3. These may be caused due to nutritional deficiency, old age, malfunctioning of an organ, allergy, pollution or genetic disorders.
4. Some spreading agent is needed to spread the microbes or pathogens.	4. No spreading agent is needed.
Examples: Smallpox, chickenpox, pneumonia, common cold, influenza, dysentery, cholera, typhoid, tuberculosis, etc.	Examples: Marasmus, kwashiorkor, anaemia, rickets, scurvy, goitre, haemophilia, thalassaemia, blood pressure, heart diseases, arthritis, allergy, etc.

2. **Health** is a state of person's physical, mental and social well being, whereas **disease** is any deviation from the normal functioning of any organ or part of an individual's body.
 3. **HIV** (Human Immunodeficiency Virus) is the causative agent of AIDS, whereas **AIDS** is Acquired Immune Deficiency Syndrome in which immune system of the body gets destroyed by HIV.
 4. **First degree burns** affect only the top layer of skin, whereas **third degree burns** reach up to the deepest layer of skin and the skin may have charred appearance.
- E. 1.** (a) Diseases may be caused by viruses, bacteria, fungi, protozoa and helminthes.
- (b) Some diseases are caused by nutritional deficiency, genetic disorders, allergy, pollution, unhygienic habits and malfunctioning of some body organ.
2. The diseases which are transmitted from an infected person to a healthy person are called communicable diseases.
- Communicable diseases are transmitted by:
- (a) Direct contact, e.g., smallpox, mumps, measles, etc.
 - (b) Contaminated air, e.g., influenza, pneumonia, polio, tuberculosis, etc.
 - (c) Contaminated water, e.g., cholera, jaundice, hepatitis, etc.
 - (d) Contaminated food, e.g., cholera, diarrhoea, etc.
 - (e) Vectors, e.g., malaria, typhoid, sleeping sickness, dengue, etc.
 - (f) Animal bite, e.g., rabies.
 - (g) Unhygienic habits, e.g., typhoid, diarrhoea, dysentery, etc.
 - (h) Contact with soil, e.g., tetanus.
3. To lead a healthy life, one needs to
- (a) eat a balanced diet.
 - (b) do physical exercise regularly.
 - (c) take adequate sleep.
 - (d) take care of personal and domestic hygiene.
 - (e) drink clean and purified water and eat fresh food.
 - (f) breathe in fresh and clean air.
 - (g) keep away from tobacco, alcohol and drugs.
 - (h) take proper care of sense organs.
 - (i) visit a doctor regularly to follow regular check ups.
 - (j) get regular vaccinations.

4. Vaccination is the introduction of vaccine in the body of a person to develop resistance to a particular disease.
Following are the four ways in which vaccines are produced:
- (a) by killing germs.
 - (b) from weakened germs.
 - (c) from toxoids made from toxins released by bacteria.
 - (d) from attenuated viruses.
5. Emergency care for burns:
- (a) In case of superficial burns, i.e., first and second degree burns, place the burnt part immediately in cold water or put some ice cubes on it to reduce burning sensation and formation of blisters. Blot the affected area and apply turmeric (haldi) powder or heena (mehandi). Apply a soothing cream like burnol.
 - (b) In case of deep burns or third degree burns, never use water. Apply burnol or some other ointment. Wrap the wound with a clean sheet or towel and rush to a doctor.
 - (c) In case of chemical burns, wash the burnt area immediately with large amount of cold water for at least 10 minutes. Cover the burnt part with sterile dressing.
6. The diseases can be prevented and controlled by:
- (a) adopting healthy lifestyle and healthy food habits.
 - (b) keeping surroundings clean.
 - (c) maintaining personal hygiene.
 - (d) maintaining public hygiene.
 - (e) promoting vaccination and immunisation.
 - (f) providing health education in schools.
 - (g) establishing health centres at various localities in the cities and in villages.
7. (a) In case of swallowing of some poison, make the victim to drink large quantity of salt water to induce vomiting.
- (b) **First aid in case of wasp sting:**
 - (i) first of all remove the sting.
 - (ii) wash the wound and then apply limewater or ammonia.
 - (iii) apply ice cubes or cold water to reduce pain and swelling.
 - (iv) apply some antihistamine cream.
 - (c) **First aid in case of snake bite:**
 - (i) make the victim lie down to rest.

- (ii) do not allow him/her to move or run.
 - (iii) place the bitten part below the level of heart.
 - (iv) tie a band of cloth at the joint next to the point of bite, and another band between the heart and wound, to check the flow of poison towards heart.
 - (v) wash the wound with soap and water and take medical help as early as possible.
- (d) In case of severe bleeding, make the victim to lie still till an ambulance arrives.
8. The nonsmokers sitting with or in contact with active smokers inhale some smoke and become prone to develop ill health or such effects as seen in active smokers. This is called passive smoking.
9. (a) **Pneumonia:** It is caused by *Streptococcus pneumoniae* or *Diplococcus pneumoniae*.
Symptoms: Infection of lungs and high fever.
- (b) **Cholera:** It is caused by *Vibrio cholerae*.
Symptoms: Loose motions, vomiting causing dehydration.
10. **Vector:** Female *Aedes aegypti* and *A. albopictus* mosquito.
Pathogen: Alpha virus or chikungunya virus.
11. (a) Smallpox is an infectious viral disease. It spreads by droplet infection through coughing and sneezing by patient, through contact and use of personal articles of the patient. Its symptoms are fever, headache and nausea. Rashes develop on the skin that change into pustules filled with water and leave pitted scars on the skin on drying. They may even lead to blindness. It is cured by vaccination with cowpox virus. However, a world over vaccination has completely eliminated smallpox.
- (b) Measles is an infectious viral disease. It is caused by *Rubella* virus. It spreads by droplet infection through sneezing and coughing by patient. Its symptoms are cold, sore throat followed by high fever (up to 106°F) and pink rashes on body. It is cured by vaccination which gives life-long immunity.
12. Rabies is transmitted by the bite of rabid animals like dog, monkey, cat, etc.
13. (a) **Harmful effects of taking alcohol:**
- (i) It causes damage to the liver and nervous system.
 - (ii) It leads to slow response, reduces self-control, impairs judgement and causes disorientation.

- (iii) It affects neuro-muscular coordination of the body leading to accidents.
- (b) **Harmful effects of taking narcotic drugs:**
 - (i) They damage the nervous system.
 - (ii) They have adverse effects on respiratory and cardiovascular systems.
 - (iii) They increase chances of heart attack and cardiac failure.
 - (iv) They cause hallucination and illusions, which affect vision and hearing.
 - (v) They reduce appetite which leads to general weakness and anaemia and pale skin.
 - (vi) By sharing the same needle for injecting drug, drug addicts spread AIDS in the community.

F. 1. –(d) 2.–(e) 3.–(a) 4.–(b) 5.–(c)

G. 1. True

2. False; **Malaria** is treated by chloroquine.

3. False; Polio is a **viral** disease.

4. True

5. True

H. 1. Cancer; It is a disease, others are related to immunity.

2. Diphtheria; It is an air-borne disease, others are food and water-borne diseases.

3. Malaria; It is a protozoan disease, others are viral diseases.

4. Phagocytosis; It is a mode of ingestion of food by animal cell, others are related to immune system of the body.

I. 1. Cut fruits from roadside vendors are exposed to dust and flies which carry disease-causing germs. So, they are contaminated and should not be eaten.

2. Cold and influenza are air-borne diseases. Their viruses spread by sneezing and coughing. In public places, the air is contaminated with such viruses and causes infection when inhaled.

3. Cigarette smoking is injurious to health because it causes inflammation and irritation of the mucous lining of nose, throat, trachea and lungs. It increases chances of cancer, heart attack and increased blood pressure due to hardening of the wall of blood vessels.

4. Alcohol affects the functioning of cerebellum due to which, cerebellum cannot coordinate the movements of voluntary

muscles. Also, alcohol slows down the response, reduces self-control, impairs judgement and affects neuromuscular coordination. These cause poor manipulation leading to accident while driving.

J. 1. (d) 2. (d) 3. (d) 4. (d) 5. (d) 6. (a) 7. (a) 8. (a)

THINK ZONE

- We should cover our nose and mouth while sneezing to prevent droplet infection of viral diseases such as cold, flu, chickenpox, smallpox, etc.
- Passive smokers also inhale smoke released by active smokers. The cigarette smoke contains a large number of cancer-causing substances. Therefore, passive smokers are also at the risk of cancer.
- Vaccination is important because it provides resistance to body against various infectious diseases.

CHAPTER 9. Food Production

Check Point 1

1. *Lactobacillus* bacterium
2. alcoholic beverages
3. Lactic acid
4. yeast
5. mushrooms

Check Point 2

1. cash
2. agriculture
3. Horticulture
4. kharif
5. October/November; March/April
6. rainy; kharif crops

Check Point 3

1. Green revolution is the great improvement in the production of foodgrains and other agricultural produce in India during the period 1960–80.
2. During the period 1960–80, there was a great improvement in the production of food grains and other agricultural produce that made our country self-sufficient in food production. Therefore, it is known as the golden era of Indian agriculture.
3. (a) High-yielding varieties
(b) Benzene hexachloride
(c) Farmyard manure
4. Crop rotation helps in restoring mineral content of the soil. When different crops are grown alternately, the minerals used by one crop are replenished by the successive crop.

5. **Farmyard manure** is prepared by the decomposition of farm waste such as cattle dung, straw, leaves, etc. by the soil bacteria and fungi, whereas **compost** is prepared by the decomposition of organic part of domestic waste such as food refuse, kitchen waste, sewage sludge, etc. in confined area, under controlled conditions.

Check Point 4

1. Jersey, Brown Swiss
2. Cowpox, Foot and mouth disease
3. Murrah, Surti
4. Horse, Bullock

Check Point 5

1. True 2. False 3. False 4. False

TEST YOURSELF

A. 1. edible

2. broiler

3. hybridisation or cross-breeding

4. crop rotation, mixed cropping; intercropping

5. orchards

B. 1. Yeast

2. *Lactobacillus*

3. Fermentation

4. Organic farming

5. Draught animals

6. Pisciculture

C. 1. **Exotic breed** is the variety which is introduced to a place from some other country or place by man.

2. Birds like chicken, hen, duck, goose, turkey, etc. which are used or raised for eggs and meat are called **poultry**.

3. **Hybridisation** is the cross-breeding or crossing between plants or animals of two different varieties to obtain a new hybrid variety with desired characteristics.

4. Milk-yielding female cattle such as cows, buffaloes, goats, etc. are called **milch breeds**.

5. **Organic farming** is the practice of raising crops using organic manures, different patterns of cropping, mechanical and manual methods of weeding and biopesticides instead of chemical fertilisers and pesticides.

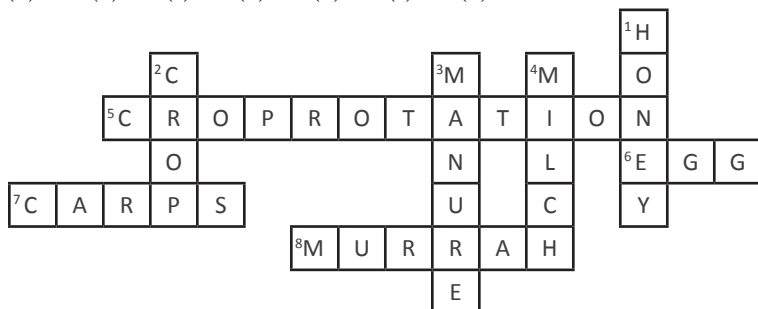
6. **Crop rotation** (rotation of crop) is the practice of growing different types of crops in succession on the same piece of land.
 7. **Green revolution** is the great improvement in the production of foodgrains and other agricultural produce in India during the period 1960–80.
 8. **Biofertilisers** are the organisms which increase soil fertility. They are nitrogen-fixing bacteria, *Azotobacter*, mycorrhiza, etc.
- D.**
1. False; White revolution in India was the result of efforts made by **Dr. V. Kurien**. (Or **Green revolution** in India was the result of efforts made by Dr. Swaminathan).
 2. False; Murrah is a dairy breed of **buffaloes** from Punjab.
 3. True
 4. False; Viral haemorrhagic septicemia is a viral disease of **fish farming**.
 5. False; Excessive use of fertilisers **damages the crop plants**.
 6. True
 7. True
- E.**
1. –(b) 2.–(c) 3.–(d) 4.–(e) 5.–(a)
- F.**
1. Yeast; It is a microorganism, others are products produced by the action of microorganisms.
 2. Murrah; It is a breed of buffalo, others are breeds of cow.
 3. Cocoon; It is a protective case around a pupa of silk moth, others are members of the colony of honeybees.
 4. Groundnut; It is a cash crop (oilseeds), others are food crops (cereals).
- G.**
1. **Farmyard manure** is prepared by the decomposition of farm waste such as cattle dung, straw, leaves, etc. by the soil bacteria and fungi, whereas **vermicompost** is prepared by decomposition of organic matter in confined area, under controlled conditions by introducing earthworms in the heap of organic matter.
 2. Crop grown for obtaining vegetables, fruits and flowers is called **horticulture crop**, whereas crop grown for commercial purposes to earn money rather than to be used by the grower is called **commercial crop**.
 3. The crop grown for the purpose of food is called **food crop**, whereas crop grown for commercial purposes to earn money rather than to be used by the grower is called **cash crop**.
 4. **Aquaculture** is the rearing and breeding of food fishes like prawns, crabs, etc. in ponds, lakes, rivers, estuaries and lagoons,

whereas **pisciculture** is the production and management of fishes which includes farming of both marine and freshwater fishes.

5. **Exotic breed** is the variety which is introduced to a place from some other country or place by man, whereas **indigenous** breed is the variety which is native to a place and occur there naturally.
 6. Milk-yielding female cattle such as cows, buffaloes, goats, etc. are called **milch breeds**, whereas males of livestock such as bullocks, horses, mules, etc. used for agricultural work are called **draught breeds**.
- H. 1. Yeast cells break the sugar and produce alcohol and carbon dioxide. Bubbles of carbon dioxide gas fill the spaces in dough and make it rise.
2. During Green Revolution, high-yielding dwarf varieties of wheat were introduced from Mexico and Australia, and new varieties of wheat with desirable characteristics were developed by cross-breeding methods. Also, high-yielding varieties of rice, maize, bajra, sugarcane, etc. were developed by our scientists. This made our country self-sufficient in food production.
 3. Manure is considered better than chemical fertilisers because:
 - (a) It is made by the decomposition of kitchen waste, animal waste, farm litter, etc., by microorganisms. This utilises the waste.
 - (b) It provides humus to the soil which improves physical and chemical properties of soil.
 - (c) It improves water-holding capacity of soil and makes it porous and airy.
 - (d) It provides the soil with all the nutrients.
- On the other hand, chemical fertilisers cause soil and water pollution, and their excessive use can damage the crop plants.

I. 1. (d) 2. (b) 3. (c) 4. (b) 5. (d) 6. (c) 7. (b)

J.



THINK ZONE

- Chemical fertilisers make the soil more acidic or alkaline and hence, deform the nature of soil.
- Crop rotation helps in restoring mineral content of the soil because the minerals used by one crop are replenished by the successive crop. On the other hand, addition of fertilisers makes soil more acidic or alkaline and hence, deforms the nature of soil.
- Paddy needs a large amount of water to grow but in this condition, its seed cannot germinate. They germinate only in optimum conditions of temperature and moisture. Once the seeds germinate and acquire a certain height, they are transplanted in waterbeds. On the other hand, wheat needs much less water. So, it is grown directly by sowing the seeds.