

**ICSE Board  
Class IX Biology  
Paper – 1 Solution**

---

**SECTION-I**

**Answer 1**

**(a)**

- (i) Hydrolytic
- (ii) B/C
- (iii) Amino acids
- (iv) Virus
- (v) Glycogen

**(b)**

- (i) True
- (ii) True
- (iii) False. (DDT is a non-biodegradable waste.)
- (iv) True
- (v) False. (Coconut is a fleshy fruit. )

**(Explanation provided in the bracket is for your learning. You may not be required to write an explanation in your answer to this question)**

**(c)**

- (i) Cell
- (ii) HIV (Human immunodeficiency virus)
- (iii) Mussel
- (iv) Serum
- (v) Fungi

**(d)**

- (i) Ulna (The rest are the bones of the hind limb, while Ulna is a bone of the forelimb)
- (ii) *Spirogyra* (The rest are fungi, while *Spirogyra* is an alga)
- (iii) Crab (The rest belong to Class Insecta, while Crab belongs to Class Crustacea)
- (iv) Nymph (The rest are the stages of life history of insects, while Nymph is an immature form of insects)
- (v) Mumps (The rest are non-infectious diseases, while Mumps is an infectious disease)

**(Explanation provided in the brackets is for your learning. You may not be required to write an explanation in your answer to this question)**

**(e)**

- (i) Enzymes are biocatalysts, which alter the rate of biochemical reactions. They are pH sensitive. E.g. Pepsin.
- (ii) Germination is the process in which the inactive embryo becomes active and changes into a seedling.
- (iii) Hygiene is the science and practice of maintaining good health.
- (iv) Plasmasol is the inner zone of granular cytoplasm in amoeba.
- (v) Pollination is the process of transfer of pollen grains from the anther to the stigma of a flower.

**(f)**

Name of the disease	Causative agent	Preventive measure
1. Whooping cough	<i>Haemophilus pertussis</i>	DPT vaccine
2. Tetanus	<i>Clostridium tetani</i>	DPT vaccine
3. Malaria	<i>Plasmodium</i>	Destruction of mosquitoes
4. AIDS	HIV (Human immunodeficiency virus)	Avoid sexual contact with an infected person
5. Diphtheria	<i>Corynebacterium diphtheriae</i>	DPT vaccine

**(g)**

- (i) Seeds without a distinct region of food storage are called **non-endospermic** seeds.
- (ii) The housefly transmits **typhoid** germs.
- (iii) **Lipase** is a fat-digesting enzyme.
- (iv) Ribosomes help in **protein synthesis**.
- (v) The opening through which water enters into a seed is called the **micropyle**.

**(h)**

- (i) 1: Dorsal fin; 2: Pectoral fin; 3: Pelvic fin; 4: Anal fin; 5: Operculum
- (ii) Part 5 i.e. operculum protects the gills.
- (iii) The given organism breathes with the help of gills.
- (iv) Ectothermal means cold-blooded. Animals, which cannot change their body temperature, and their body temperature fluctuates according to the surrounding temperature are called ectothermal animals.

## SECTION-II

### Answer 2

(a)

(i) Structure of the bone:

- The outer surface of the bone is called periosteum. Periosteum is a thin, dense membrane that consists of an outer fibrous and an inner cellular layer, nerves and blood vessels that nourish the bone.
- The next layer is made up of compact bone. This part is highly calcified, very hard and rigid connective tissue. This tissue gives bones a smooth, white and solid appearance. The middle layer of bone consists of bone cells called osteocytes, which are arranged in the form of concentric rings. They are embedded in a hard matrix made up of collagen fibre and mineral deposits.
- The innermost hollow cavity of long bones contains the bone marrow, which produces blood cells. Red bone marrow is present at the ends of the bone and produces the majority of red blood cells, platelets and most of the white blood cells. Yellow bone marrow contains a higher amount of fat cells than red marrow and helps in the production of some white blood cells.

(ii) Differences between self-pollination and cross-pollination:

Self-pollination	Cross-pollination
1. It is the transfer of pollen grains from the anther to the stigma of the same flower.	1. It is the transfer of pollen grains, from the anther of one flower, to the stigma of another flower of a different plant of the same species.
2. It does not require any external agent like wind, water and insects to carry out pollination.	2. It requires an external agent for pollination to occur.
3. It can take place even when the flower is closed.	3. It can occur only when the flower is open.
4. In self-pollinated flowers, the anther and stigma mature at the same time.	4. In cross-pollinated flowers, the anther and stigma mature at different times.
5. New varieties are not possible	5. New varieties can be produced

**(b)**

(i) Adaptations of fruits and seeds dispersed by animals:

1. Fruits contain fleshy pulp.
2. Seeds may contain hooks or spines to stick to the body of animals.
3. Some seeds have sticky glandular hair.

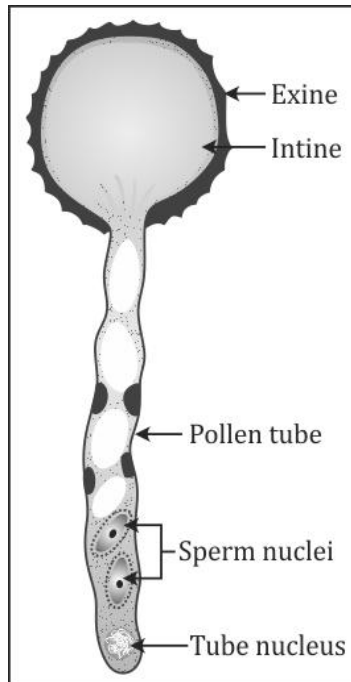
(ii) Propagation methods:

1. Sugarcane: By stem cutting.
2. Ginger: By underground stems called rhizomes.
3. Banana: By suckers.
4. Potato: By tubers.

### Answer 3

(a)

(i)



(ii) Fertilisation in an ovule takes place by two sets of gametes. One of the male nucleus combines with the egg to form the zygote and changes into an embryo. The other male nucleus fuses with the polar nuclei forming the endosperm nucleus, which later changes into an endosperm. This process is called double fertilisation.

**(b) Methods of Food Preservation**

<b>METHOD</b>	<b>PRINCIPLE</b>	<b>PRESERVED FOOD MATERIALS</b>
Boiling	Boiling water kills all bacteria. Higher temperatures (110°C) kill spores.	Fruits
Salting	Biodegradation is prevented under normal conditions.	Pickles
Dehydration (Drying)	Inhibits the growth of microbes.	Grains
Irradiation	Radioactive or ultraviolet radiation kills microorganisms.	Bakery products
Pasteurisation	Heating to temperatures of about 60°C for 30 min and then chilling, kills bacteria.	Milk
Refrigeration	Inhibits growth and multiplication of microbes.	Vegetables
Chemical preservatives	Example: Sodium benzoate increases the concentration of solutes and causes plasmolysis and death of bacteria and moulds.	Jams

#### **Answer 4**

- (i) In hilly areas, the iodine content in the food is less. Iodine is needed for the proper functioning of the thyroid gland. Lack of iodine in the diet causes goitre, which is manifested in the form of a swollen neck. Therefore, people living in hilly regions have swollen neck.
- (ii) The housefly feeds on garbage. When it sits on uncovered food, it transfers the disease-causing germs to the food items, and spreads diseases like, cholera. Therefore, the housefly is called 'Public Enemy No. 1'.
- (iii) Enzymes are specific in their action. Some enzymes work in acidic medium, e.g., pepsin, while others work in an alkaline medium, e.g., trypsin. This is why, enzymes are said to be pH sensitive.
- (iv) In each trophic level, energy is lost in the form of heat. Therefore, the amount of usable energy transferred to the next level is less. This is why, most of the food chains contain four to five trophic levels.
- (v) The pancreas contains both an exocrine and an endocrine part. The exocrine part produces pancreatic juice, which helps in digestion, while the endocrine part produces the hormone insulin.

#### **Answer 5**

##### **(a)**

- (i) Functions of the skin:
  - 1. It protects the internal organs and also protects the body from bacterial invasion.
  - 2. It regulates body temperature.
  - 3. It synthesizes Vitamin D.
  - 4. It acts as a sense organ for touch, pain, pressure, temperature, etc.
- (ii) Fermentation is the process by which micro-organisms convert glucose into ethyl alcohol and carbon dioxide. e.g., curdling of milk.

##### **(b)**

- (i)
  - 1. Animals belonging to Phylum Mollusca are mostly aquatic.
  - 2. They possess bilateral symmetry.
  - 3. Animals have soft and unsegmented body.
- (ii)
  - 1. Liverfluke
  - 2. It belongs to Phylum Platyhelminthes.

## Answer 6

(a)

(i) Disadvantages of vegetative propagation:

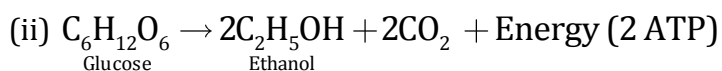
- The same variety is produced year after year.
- Undesirable characters get transmitted from one generation to another.
- The offspring produced are susceptible to the same diseases.

(ii) Differences between earthworm and roundworm:

Earthworm	Roundworm
1. It belongs to Phylum Platyhelminthes.	1. It belongs to Phylum Annelida.
2. It has a segmented body.	2. It has a cylindrical body.
3. It has a true body cavity.	3. It does not have a true body cavity, but possesses pseudocoel

(b)

(i) Anaerobic respiration is a type of respiration in which oxygen is not used.

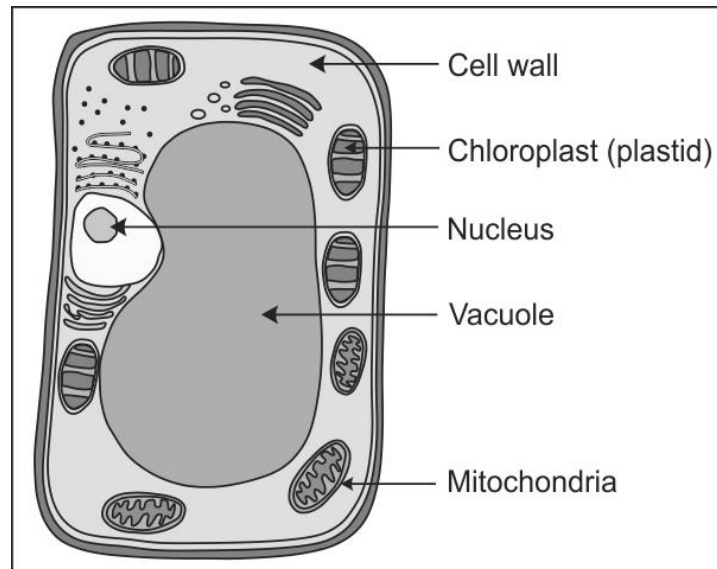


(iii) Air breathed in and out, in normal quiet breathing is called tidal volume. It is approximately 500 mL per inspiration.



## Answer 7

**(a)** Structure of a plant cell:



**(b)**

**(i)** Grafting is joining a part (stem or bud) of a living plant to another, causing it to grow as a part of another plant.

Method of grafting:

1. Two related plants or trees are chosen, one receiving the bud or shoot (stock), and the other as a twig (scion) to be fixed on it.
2. A branch or stem of the scion is removed by making a slanting cut.
3. The stem of the stock is also cut in a slanting way.
4. The scion is placed over the stock and both the cut surfaces are fitted together and then, bound together tightly with a piece of cloth.
5. As the cambium promotes growth, ensure that the cambium layer of the scion is in contact with the cambium layer of the stock.
6. The joint is then covered with a polythene sheet to prevent it from getting infected by harmful bacteria, fungus and other disease causing germs. It also prevents dehydration or loss of water and plant sap from the cut and joined ends of the stock and scion.
7. Once the cut or the union of the scion and stock heals, the two plants grow together and become a single plant.

**(ii) Test for the presence of proteins:**

**Procedure:**

1. Take a piece of hardboiled egg white in a test tube.
2. Add few drops of dilute nitric acid to it.
3. Heat the test tube gently.
4. Rinse off the acid with water and add few drops of ammonium hydroxide to it.

**Observation and Inference:**

The colour of the solution changes, first from colourless to yellow and then from yellow to orange red, indicating the presence of proteins.