

# ICSE 2025 EXAMINATION

## Sample Question Paper - 3

### BIOLOGY

Time: 2 Hours.

Total Marks: 80

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#### General Instructions:

1. Answers to this paper must be written on the paper provided separately
  2. You will be not allowed to write during first 15 minutes
  3. This time is to be spent in reading the question paper.
  4. The time given at the head of this paper is the time allowed for writing the answers.
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**Section A** is compulsory. Attempt any **four questions** from **Section B**.  
The intended marks for questions or parts of questions are given in brackets [ ]

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#### SECTION A

*(Attempt all questions from this Section.)*

#### Question 1

Choose the correct answers to the questions from the given options.  
(Do not copy the question, write the correct answer only.)

[15]

- (i) While eating her breakfast hurriedly, Nisha started to get hiccups. Hiccups occur when the food particles enter the windpipe instead of the food pipe. Which structure prevents the food from entering the windpipe during swallowing?
1. Epiglottis
  2. Pharynx
  3. Larynx
  4. Salivary gland
- (ii) **Assertion (A):** Lysosomes are also called suicidal bags of the cell.  
**Reason (R):** When the cell gets damaged, lysosomes burst, and their enzymes digest their own cell.
1. Both A and R are true
  2. Both A and R are false
  3. A is true and R is false
  4. A is false and R is true
- (iii) Tendons and ligaments are examples of
1. Fibrous connective tissue
  2. Cartilage
  3. Muscular tissue
  4. Adipose tissue

(iv) Which of the following is a characteristic of self-pollinated flowers?

1. Flowers are large and showy
2. Flowers remain closed and do not open
3. Stigma and anthers mature at the same time
4. Pollen is produced in very large quantities

(v) **Assertion (A):** Carbon dioxide produced during respiration in the leaves serves as a raw material for photosynthesis.

**Reason (R):** During night-time, due to photosynthesis, the leaves produce oxygen.

1. Both A and R are true
2. Both A and R are false
3. A is true and R is false
4. A is false and R is true

(vi) Identify the bacterium.



1. Coccus
2. Spirillum
3. Bacillus
4. Vibrio

(vii) **Assertion (A):** Alveoli of the lungs are lined by epithelial cells.

**Reason (R):** Gas exchange occurs in the lungs.

1. Both A and R are true
2. Both A and R are false
3. A is true and R is false
4. A is false and R is true

(viii) If for some reason, the sebaceous glands fail to function, then

1. The body will not be able to regulate the body temperature
2. The skin will turn darker with more melanin
3. The hair will fail to grow
4. The skin will turn dry and rough

(ix) Which one of the following categories of vertebrae are correctly matched?

1. Cervical - 7
2. Thoracic - 10
3. Lumbar- 4
4. Sacral- 4

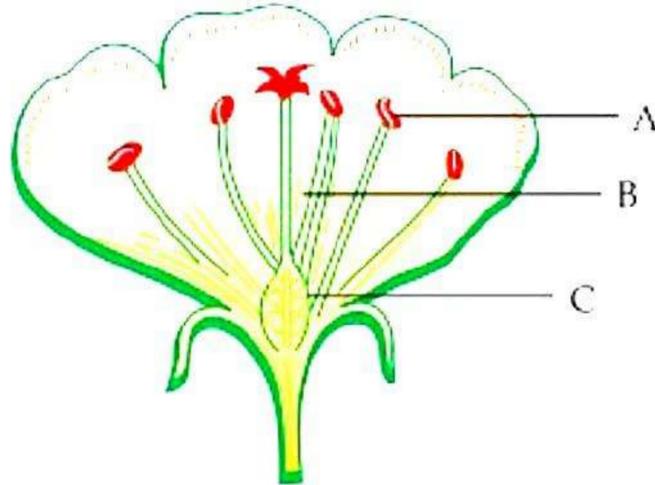
(x) Pylorus is an opening from the

1. Oesophagus into the stomach
2. Mouth cavity into the stomach
3. Stomach into the intestine
4. Intestine into the rectum

(xi) Kishor is three years old. He has a diet poor in proteins. He is underweight and has a protruding belly with oedema of the feet and the face. Which nutritional deficiency disorder is Kishor possibly suffering from?

1. Marasmus
2. Kwashiorkor
3. Rickets
4. Beriberi

(xii) Which of these parts assist in the production of pollen grains?



1. A only
2. B only
3. A and B only
4. B and C only

(xiii) Which of the following plant parts is correctly matched with one of its stated characteristics?

1. Mango seed - Aleurone layer
2. Bean seed - Endosperm
3. Maize grain - Coleoptile
4. Wheat grain - Exalbuminous

(xiv) **Assertion (A):** The Red Cross Society was founded in 1948.

**Reason (R):** The function of Red Cross Society is to educate people in accident prevention.

1. Both A and R are true
2. Both A and R are false
3. A is true and R is false
4. A is false and R is true

(xv) Given below are few statements which describe a particular disease in humans.

- I. It is caused by *Wuchereria bancrofti*.
- II. It is transmitted through the bite of the *Culex* mosquito.
- III. It is also referred to as 'Elephantiasis'.

Which of the following diseases is being described above?

1. Taeniasis
2. Filariasis
3. Ascariasis
4. Amoebiasis

## Question 2

(i) **Name the following.** [5]

- (a) The sweet fragrant liquid of flowers.
- (b) The causative agent of AIDS.
- (c) The space present between the incisors and the premolars.
- (d) The bacterium which causes cholera.
- (e) A measure taken to maintain health and prevent the spread of a disease.

(ii) **State whether the following statements are True or False.** [5]

- (a) Double coconut is the largest seed.
- (b) Insects have two pairs of legs.
- (c) Fungi reproduce by producing spores.
- (d) Intercostal muscles help in internal respiration.
- (e) Keratin protects us from ultraviolet rays.

(iii) **Match the items given in Column I with the most appropriate ones in Column II and rewrite the correct matching pairs.** [5]

Column I	Column II
(a) Ribosomes	1. Cell division
(b) Vacuoles	2. Protein synthesis
(c) Cell membrane	3. Regulates growth of the cell
(d) Centrioles	4. Store excess water
(e) Nucleus	5. Entry and exit of substances in and out of the cell
	6. Respiration of the cell
	7. Turgidity to the cell

(iv) **Choose the odd one out from the following terms and name the category to which the others belong:** [5]

- (a) Frog, Lizard, Snake, Tortoise
- (b) Chloroplast, Centrosome, Cell wall, Endoplasmic reticulum
- (c) Collenchyma, Sclerenchyma, Parenchyma, Cartilage
- (d) Lysol, Carboic acid, Benzoic acid, Formalin
- (e) Pine, *Chlamydomonas*, *Amoeba*, *Paramecium*

(v) **State two differences between each of the following pairs.** [5]

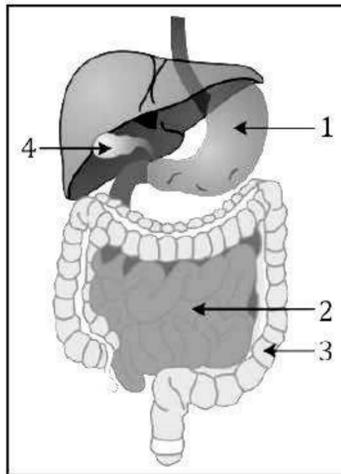
- (a) Prokaryotic and Eukaryotic cell
- (b) Respiration and Breathing
- (c) Parenchyma and Sclerenchyma
- (d) Striated and Unstriated muscles
- (e) Active immunity and Passive Immunity

## SECTION B

(Attempt any four questions from this section.)

### Question 3

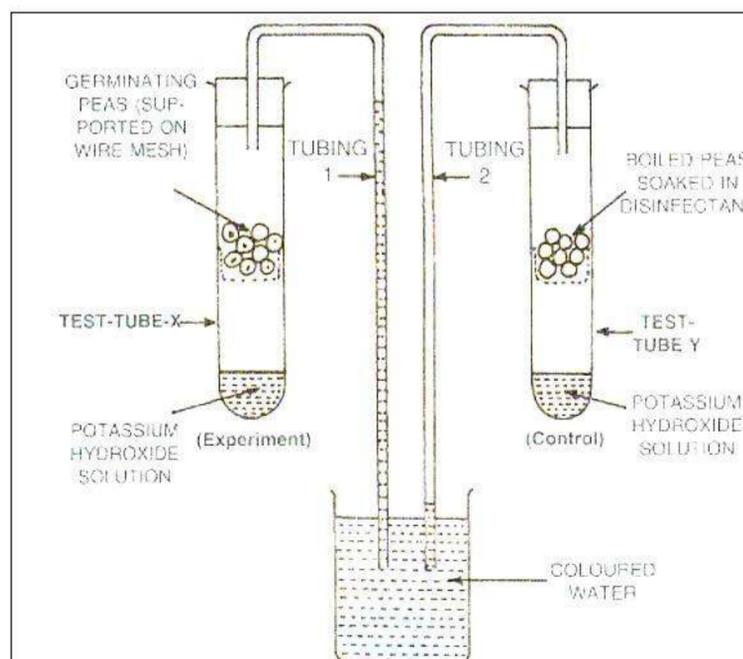
- (i) What is incineration? [1]
- (ii) State the functions of: [2]
  - (a) Stigma
  - (b) Hypocotyl
- (iii) Draw a neat and a labelled diagram of a mature bean seed. [2]
- (iv) Give reason: The vertebral column is curved. [2]
- (v) The given figure shows the human alimentary canal. [3]



- (a) Label the parts 1-4.
- (b) What is the function of part 3?
- (c) What are the steps of nutrition in humans?

### Question 4

- (i) Define tidal volume. [1]
- (ii) Write the expanded form of: [2]
  - (a) ICMR
  - (b) ZIG
- (iii) What is the function of the non-essential whorls in a flower? [2]
- (iv) A doctor advises a patient with bone problems to include more milk and milk products in his daily diet. What could be the reason? [2]
- (v) The following diagram refers to an apparatus which is used to demonstrate a physiological process: [3]



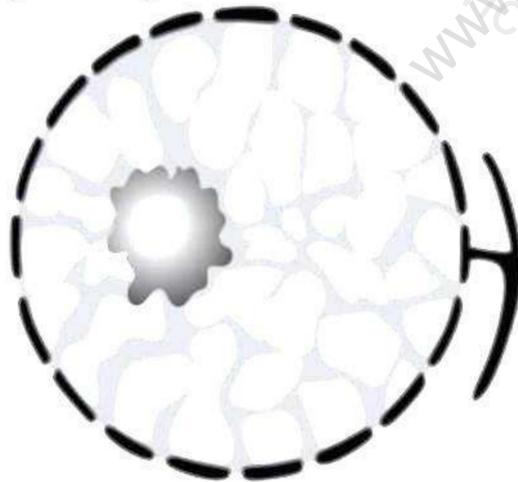
- (a) What is the purpose of keeping potassium hydroxide solution in test tubes X and Y?
- (b) Why has the coloured water risen in tubing 1?
- (c) What is the purpose of keeping boiled peas soaked in a disinfectant in test tube Y?

**Question 5**

- (i) Give two examples of monocot albuminous seeds. [1]
- (ii) Mention two essential functions of the nucleus. [2]
- (iii) Name the kind of epithelium found in the following places: [2]
  - (a) Salivary gland
  - (b) Inner lining of the windpipe
- (iv) Draw a neat and a labelled diagram of the structure of a pollen grain. [2]
- (v) What are lichens? Explain phycobiont and mycobiont. [3]

**Question 6**

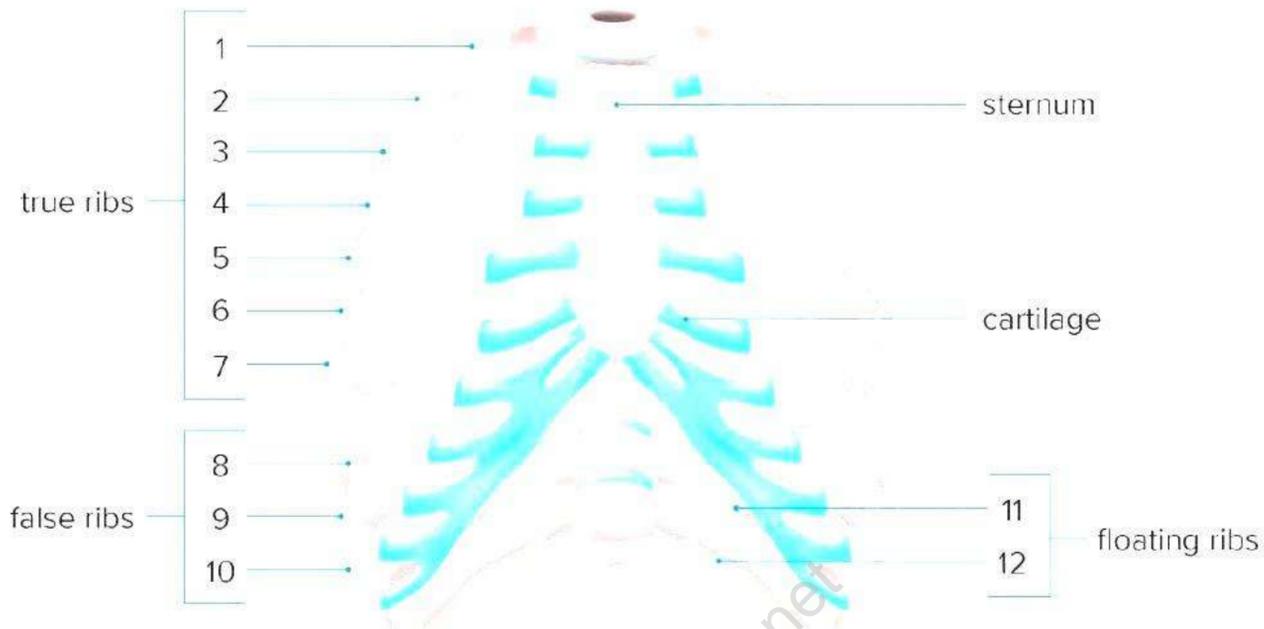
- (i) Mention the role of the pleural fluid. [1]
- (ii) What are the two kinds of fibrous connective tissue? Write one important function of each. [2]
- (iii) If we cut the bile duct, how will it affect the process of digestion? [2]
- (iv) Write *any two* important preventive measures advised by WHO to minimise the chances of getting COVID-19. [2]
- (v) The given figure shows a certain structure of a cell. [3]



- (a) Name the structure.
- (b) State the key role of this structure.
- (c) Is this structure present in all cells? If not, mention the cell that lacks this structure.

### Question 7

- (i) Explain - 'Cell inclusions.' [1]
- (ii) State two differences between self-pollination and cross-pollination. [2]
- (iii) State one example of carelessness in disposing research and laboratory waste. [2]
- (iv) What are bracts? State their function. [2]
- (v) Study the diagram below and explain the types of ribs in the human body. [3]



### Question 8

- (i) What are the causative agents of whooping cough and tetanus? [1]
- (ii) Explain the following terms: [2]
  - (a) Residual air
  - (b) Dead air space
- (iii) Briefly describe the action of hypothalamus in heat regulation. [2]
- (iv) What are antibodies? When are they produced in the body? [2]
- (v) How does spore formation take place in fungi? Explain with the help of a diagram. [3]

# Solution

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## SECTION A

### Answer 1

- (i) Epiglottis
- (ii) Both A and R are true
- (iii) Fibrous connective tissue
- (iv) Stigma and anthers mature at the same time
- (v) A is true and R is false
- (vi) Bacillus
- (vii) Both A and R are true
- (viii) The skin will turn dry and rough
- (ix) Cervical- 7
- (x) Stomach into the intestine
- (xi) Kwashiorkor
- (xii) A only
- (xiii) Maize grain - Coleoptile
- (xiv) A is false and R is true
- (xv) Filariasis

### Answer 2

- (i)
  - (a) Nectar
  - (b) Human Immunodeficiency Virus (HIV)
  - (c) Diastema
  - (d) *Vibrio cholerae*
  - (e) Prophylaxis
  
- (ii)
  - (a) True.
  - (b) False. (Insects have three pairs of legs.)
  - (c) True
  - (d) False. (Intercostal muscles help in external respiration or breathing.)
  - (e) False. (Melanin protects us from ultraviolet rays.)

(iii)

Column I	Column II
(a) Ribosomes	2. Protein synthesis
(b) Vacuoles	4. Store excess water
(c) Cell membrane	5. Entry and exit of substances in and out of the cell
(d) Centriole	1. Cell division
(e) Nucleus	3. Regulates growth of the cell

(iv)

- (a) Frog (Rest are reptiles)
- (b) Centrosome (Rest are present in a plant cell)
- (c) Cartilage (Rest are plant tissues)
- (d) Formalin (Rest are examples of antiseptics)
- (e) Pine (Rest belong to Kingdom Protista)

(v)

(a) Differences between prokaryotic and eukaryotic cell:

Prokaryotic cell	Eukaryotic cell
1. Lack a well-defined nucleus.	1. Possess a well-defined nucleus.
2. Presence of a single chromosome.	2. Presence of more than one chromosome.

(b) Differences between respiration and breathing:

Respiration	Breathing
1. Involves oxidation of glucose.	1. Involves taking in of O <sub>2</sub> and giving out CO <sub>2</sub> .
2. Liberates energy.	2. Does not liberate energy.

(c) Differences between parenchyma and sclerenchyma:

Parenchyma	Sclerenchyma
1. Cells are oval or spherical.	1. Cells are angular.
2. Nucleus is present.	2. Nucleus is absent.

(d) Differences between striated muscles and unstriated muscles:

Striated muscles	Unstriated muscles
1. Myofibrils with alternate light and dark bands.	1. Myofibrils without alternate light and dark bands.
2. Control voluntary actions.	2. Control involuntary actions.

(e) Differences between active immunity and passive immunity:

<b>Active Immunity</b>	<b>Passive Immunity</b>
1. Produced by one's own body.	1. Received from an outside source.
2. Provides effective and long-lasting protection	2. Protection is less effective and does not ensure protection against subsequent infections.

## SECTION B

### Solution 3

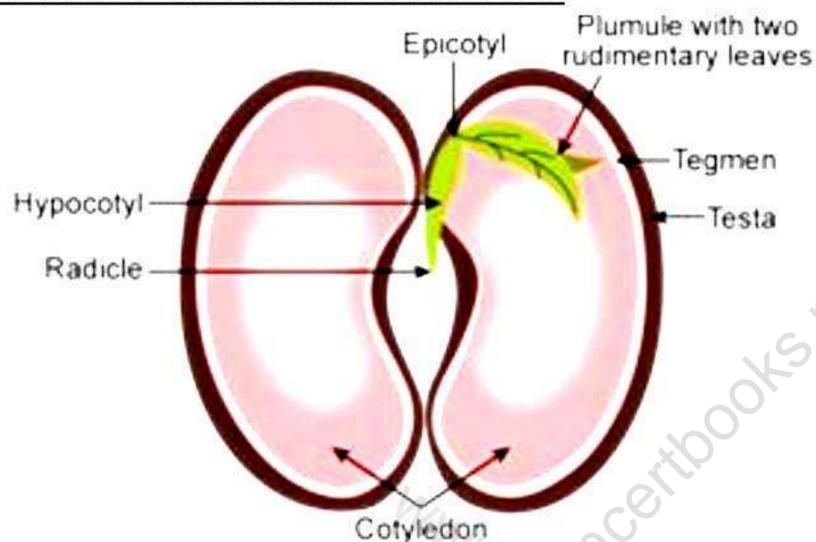
(i) Incineration is a waste disposal process that involves the combustion of organic substances contained in waste materials at very high temperatures.

(ii)

(a) Stigma: Receives pollen grains from the anther during germination.

(b) Hypocotyl: Upon germination, the hypocotyl pushes the cotyledons above the ground to develop.

(iii) Structure of a mature bean seed



(iv) The vertebral column is curved to maintain the balance of the body in an erect position. The curve absorbs pressure and shock while walking, running and protects the vertebral column from breaking.

(v)

- (a) 1 - Stomach  
2 - Small intestine  
3 - Large intestine  
4 - Gall bladder

(b) The major function of the large intestine (part 3) is to absorb water from the digested food and eliminate the undigested waste from the body.

(c) Steps of nutrition in humans:

Ingestion → Digestion → Absorption → Assimilation → Excretion

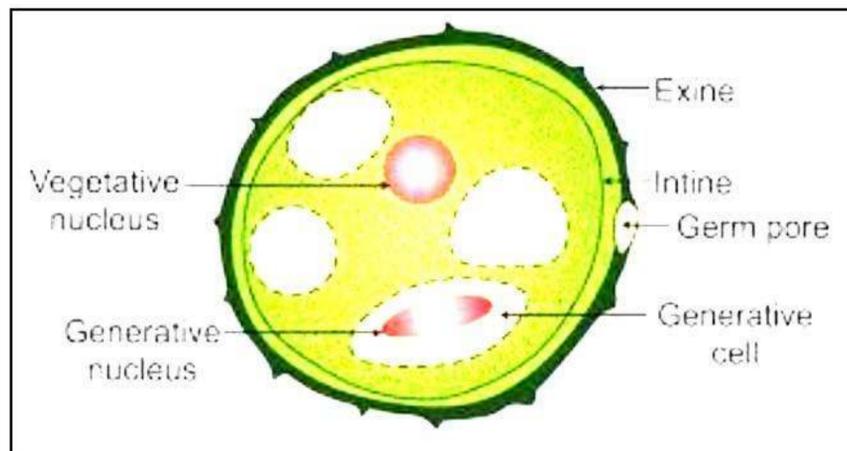
#### **Solution 4**

- (i) Tidal volume is the volume of air inspired or expired during normal breathing. It is about 500 mL.
- (ii)
- (a) ICMR: Indian Council of Medical Research  
(b) ZIG: Zoster Immune Globulin
- (iii) Non-essential whorls (sepals and petals) in a flower are also called non-reproductive or accessory whorls. They are the helping parts of a flower which either protect the reproductive parts of the flower or make the flower attractive for pollination.
- (iv) Milk and milk products are rich in calcium, phosphorus and vitamin A. Calcium and phosphorus are necessary for strengthening the bones and the teeth. To make the bones and teeth strong, the doctor advises a patient with bone problems to include more milk and milk products in his daily diet. Milk also prevents the oxidation of Vitamin A. Calcium present in the milk even helps in clotting of blood.
- (v)
- (a) Potassium hydroxide (KOH) solution is kept in test tubes X and Y to check the presence of CO<sub>2</sub>, as KOH can absorb CO<sub>2</sub>, if it is produced.
- (b) When the process of respiration takes place in test tube X, the O<sub>2</sub> present in the test tube is consumed. The CO<sub>2</sub> produced due to respiration is absorbed by the KOH present in the test tube. Hence, a space is developed due to the consumption of O<sub>2</sub> and therefore, the coloured water rises in tubing 1.
- (c) Boiled peas soaked in a disinfectant are kept in test tube Y because the boiled seeds are dead and cannot respire. Therefore, the process of respiration does not take place in test tube Y. It acts as a control for the experiment.

#### **Solution 5**

- (i) Bamboo and wheat.
- (ii) Functions of the nucleus:
- It controls all the life processes taking place inside the cell.
  - It helps in the transmission of hereditary characteristics from one generation to another.
- (iii)
- (a) Cuboidal epithelium  
(b) Ciliated columnar epithelium

(iv) Structure of a pollen grain



- (v) Lichens are the symbiotic association of blue-green algae and fungi. The fungi absorb water and mineral matter and supplies it to the algae which in turn prepares food and supplies it to the fungi. Phycobiont is the algal component of lichen and mycobiont is the fungal component.

**Solution 6**

- (i) The pleural fluid provides lubrication for free movement of the expanding and contracting lungs.
- (ii) Two kinds of fibrous connective tissue are tendons and ligaments. Tendons connects muscles to bones whereas ligaments connect bone to bone and hold them in position.
- (iii) Liver releases bile juice into the duodenum through the bile duct. Bile contains sodium carbonate, which neutralises the acid content of the food received from the stomach and makes it alkaline to enable the action of pancreatic and intestinal enzymes. Thus, if the bile duct is cut, the stomach acidity would increase making the environment unsuitable for the action of pancreatic and intestinal enzymes.
- (iv) Preventive measures advised by WHO to minimise the chances of getting COVID-19:  
(Any two)
1. Stay at home.
  2. Wash hands regularly with soap and water.
  3. Avoid crowded places.
  4. Wear masks in public places and maintain social distancing.
  5. Get vaccinated.
- (v)
- (a) Nucleus
- (b) The nucleus is the control centre of the cell. It regulates all metabolic activities of the cell. It also transfers hereditary characteristics from the parents to the offspring.
- (c) The nucleus is not present in all cells. Human RBCs do not contain a nucleus.

### Solution 7

(i) Cell inclusions are non-living intracellular components of the cytoplasm, which are not bound by any membranes and do not carry out any metabolic activity.

Example: Glycogen granules.

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

<b>Self-pollination</b>	<b>Cross-pollination</b>
1. Transfer of pollen grains from the anther to the stigma of the same flower.	1. 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. Does not require any external agent to carry out pollination.	2. Requires an external agent such as wind, water, or insects for pollination to occur.
3. In self-pollinated flowers, the anther and the stigma mature at the same time.	3. In cross-pollinated flowers, the anther and the stigma mature at different times.
4. New varieties are not possible.	4. New varieties can be produced.

(iii) An example of carelessness while disposing of research waste was seen in Delhi, where radioactive Cobalt-60 was given to waste dealers, who dumped it in the well of a housing colony. Several people were badly affected and suffered a lot due to this kind of dumping.

(iv) When a flower arises in the axil of a leaf-like structure, this structure is known as bract. Because bracts are large and brightly coloured structures, they are often mistaken for petals. This helps to attract insects for pollination.

(v) Types of ribs in the human body:

- There are twelve pairs of ribs in the human body.
- The first seven (7) pairs of ribs are attached with the sternum. They are called true ribs.
- The next three (3) pairs are connected to the 7<sup>th</sup> pair of ribs. They are called false ribs.
- The last two (2) pairs are free (not attached to the sternum). They are called floating ribs.

## Solution 8

(i) Causative agents

- Whooping cough: *Haemophilus pertussis*
- Tetanus: *Clostridium tetani*

(ii)

(a) Residual air: Some air is always left in the lungs even after forcibly breathing out. This is the left over or residual air. This volume is 1500 mL.

(b) Dead air space: Some tidal air is left in the respiratory passages such as trachea and bronchi, where no diffusion of gases can occur. This volume is called dead air space. It is 150 mL.

(iii) The hypothalamus acts like a thermostat. When the body tends to cool below the normal temperature, it switches on or speeds up the heat-producing process. When the body tends to get overheated, it accelerates the cooling process and switches off the heat-producing process. In this way, the hypothalamus assists in heat regulation of the body.

(iv) Antibodies are immunoglobulins (a type of protein) which act against germs or their secretion and destroy them. Antibodies are produced by a type of specialised lymphocytes on exposure to antigens.

(v) In the process of spore formation in fungi, several nuclei along with the cytoplasm are transferred to the tip of the sporangiophore. The tip is then partitioned off from the main hypha. It swells to form the sporangium. The protoplasm inside the sporangium breaks up into minute pieces, each of which contains several nuclei. Each piece surrounds itself with a wall and becomes a spore.

