ICSE 2025 EXAMINATION

Sample Question Paper - 5

BIOLOGY

Time: 2 Hours. **Total Marks: 80**

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.*

Section A *is compulsory. Attempt any* ***four questions*** *from* ***Section B.***
The intended marks for questions or parts of questions are given in brackets [ ]

SECTION A

(Attempt all questions from this Section)

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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) **Assertion (A):** The papaya flower is a staminate flower.
Reason (R): It contains only stamens.

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

(ii) *Vallisneria* is pollinated by

1. Water
2. Air
3. Insects
4. Bats

(iii) Whole grains and rice are the sources of vitamin

1. B_2
2. B_1
3. B_4
4. B_6

(iv) An animal of Phylum Coelenterata is

1. *Hydra*
2. *Fasciola*
3. *Ascaris*
4. Starfish

(v) Chlorenchyma is modified

1. Parenchyma
2. Collenchyma
3. Sclerenchyma
4. Aerenchyma

(vi) Ribosomes assist in

1. Protein packaging
2. Protein synthesis
3. Cell division
4. Intracellular digestion

(vii) **Assertion (A):** Hepatitis is a bacterial infection of the liver causing its inflammation.
Reason (R): Hepatitis A virus is transmitted through contaminated syringes and blood transfusions.

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

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(viii) The following two chemical reactions are supposed to indicate a certain process occurring in the green plants under two different conditions:

A $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 38\ ATP$

B $C_6H_{12}O_6 \rightarrow C_2H_5OH + 2CO_2 + 2\ ATP$

Identify A and B.

1. A – Aerobic respiration, B – Anaerobic respiration
2. A – Anaerobic respiration, B – Aerobic respiration
3. A – Aerobic respiration, B – Combustion
4. A – Combustion, B – Anaerobic respiration

(ix) Incomplete breakdown of organic matter by bacteria is called

1. Fermentation
2. Intracellular digestion
3. Decomposition
4. Putrefaction

(x) **Assertion (A):** Absorption of digested food mainly occurs in the stomach.
Reason (R): Stomach produces the hormone secretin and the intrinsic factor and it liquifies the ingested food

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

(xi) Although Rakesh and Suresh are real brothers, Rakesh has black hair while Suresh has brown hair. Their father and mother both have grey hair. These differences in the colour of the hair are due to varying quantities of

1. Keratin
2. Melanin
3. Rhodopsin
4. Lutein

(xii) Which of the following involves the arrangement of sepals in a flower?

1. Polyadelphous
2. Diadelphous
3. Polysepalous
4. Monadelphous

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(xiii) Seema had gone for trekking to the Himalayas with her friends. As she climbed higher and higher, she began to experience headache, dizziness, and shortness of breath. Which of the following could be the reason for this condition?

1. Asphyxiation
2. Hypoxia
3. Claustrophobia
4. Leukaemia

(xiv) **Assertion (A):** Development of immunity to chickenpox is considered as acquired immunity.
Reason (R): Immunity that is inherited from parents is considered as acquired immunity.

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) The bone not associated with the chest cavity is the

1. Sternum
2. Rib
3. Cartilage
4. Femur

Question 2

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

(a) The outermost hard, brownish layer of the seed coat.
(b) The sense organ which belongs to the integumentary system of our body.
(c) The biological energy currency of the cell.
(d) The diseases which are present at birth.
(e) The undigested fibrous material present in food.

(ii) Match the following: **[5]**

Common name	Scientific name
1. Honeybee	a. *Allium cepa*
2. Cobra	b. *Hibiscus rosa sinensis*
3. Onion	c. *Apis indica*
4. China rose	d. *Pavo cristatus*
5. Peacock	e. *Naja naja*

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(iii) State whether the following statements are True or False. Correct and rewrite the false statements. **[5]**

(a) Cross pollination requires abiotic and biotic agents.
(b) Fungi reproduce by producing spores.
(c) Enzymes are pH sensitive.
(d) Sulphonamides are effective in treating fungal diseases.
(e) DDT is a biodegradable waste.

(iv) State one point of difference between the following pairs on the basis of what is indicated in the brackets. **[5]**

(a) Annelids and molluscs [mode of respiration]
(b) Ciliated epithelium and columnar epithelium [location]
(c) Jaundice and mumps [mode of transmission]
(d) Premolars and incisors [function]
(e) Air-borne disease and water-borne disease [example]

(v) Given below is an example of a certain structure and its special function. Based on a similar pattern, fill in the given blanks: **[5]**

E.g., Chloroplast – Photosynthesis

(a) Ribosome	
(b) Centrosome	
(c) Haustoria	
(d) Epiglottis	
(e) Glenoid cavity	

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SECTION B

(Attempt any four questions from this section.)

Question 3

(i) What happens to the energy liberated during respiration? [1]

(ii) It is said that protoplasm cannot be analysed chemically. Why? [2]

(iii) Can you consider a cluster of eggs as a tissue? Why? [2]

(iv) What are the advantages of the following in the flower? [2]

(a) Long and feathery stigma

(b) Smooth and light pollen

(v) Answer the following questions:

(a) Germinated grams are considered highly nutritive. What is the reason?

(b) Sometimes the potatoes kept in a basket during the late rainy season start giving out small shoots. Is it germination? If yes, give reason. [3]

Question 4

(i) Rearrange the following categories of classification in their proper sequence starting with the highest. [1]

Species, Family, Genus, Class, Order, Phylum

(ii) Why is spore formation in bacteria not considered as a form of reproduction? [2]

(iii) Define the terms:

(a) Balanced diet [2]

(b) Malnutrition

(iv) How is thorough chewing of food helpful in digestion? [2]

(v) What are antagonistic muscles? Describe briefly. [3]

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Question 5

(i) Name one modified sweat gland and any one modified sebaceous gland. [1]

(ii) Why is it important to know how the germs leave the body of an infected person? [2]

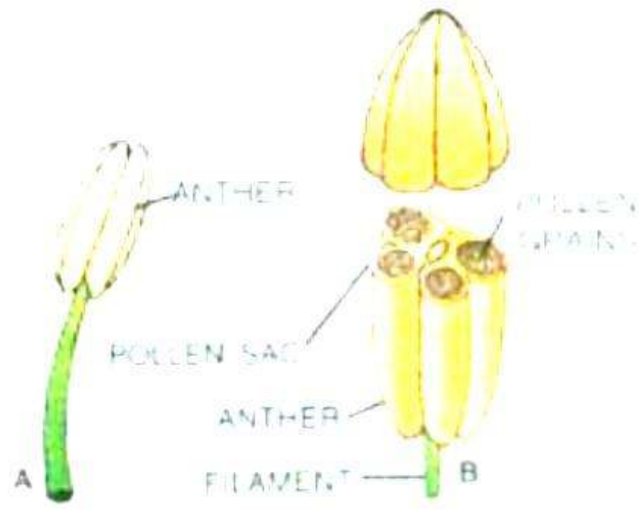
(iii) What are the group names for the following categories of animals? [2]

(a) Animals with a hairy skin

(b) Animals with feathers

(iv) Name one body part where ciliated epithelium is found in humans. What is its function? [2]

(v) Observe the figure given below and answer the questions based on it. [3]



(a) Which major organ of the flower does the figure A represent?
(b) What do the contents of the pollen sacs in figure B represent?
(c) How will the contents of the pollen sacs come out?

Question 6

(i) Why does gaseous exchange continue in the lungs even during expiration? [1]
(ii) How does the skin protect the body against excessive loss of heat in severe cold? [2]
(iii) Do the muscles pull the structures or push them? Explain. [2]
(iv) What is roughage? Give two examples. [2]
(v) Give any three roles of microorganisms in industrial production. [3]

Question 7

(i) One should breathe by nose and never by mouth. Give reason. [1]
(ii) Mention any three ways by which potable water can be contaminated. [2]
(iii) Name any three vaccines and the diseases for which they provide immunity. [2]
(iv) State two functions of World Health Organisation. [2]
(v) Describe the usefulness of incineration of waste along with the safety precautions required for it. [3]

Question 8

(i) Give the scientific name of man. [1]
(ii) Why is it usually difficult to demonstrate respiration in green plants? [2]
(iii) What is goose flesh? How is it brought about? [2]
(iv) Mention two ways in which the ileum of the mammal is adapted for the absorption of digested food. [2]
(v) Describe the advantages and disadvantages of cross-pollination to the plant. [3]

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Solution

SECTION A

Solution 1

(i) Both A and R are true
(ii) Water
(iii) B_1
(iv) *Hydra*
(v) Parenchyma
(vi) Protein synthesis
(vii) Both A and R are false
(viii) A – Aerobic respiration, B – Anaerobic respiration
(ix) Putrefaction
(x) Both A and R are false
(xi) Melanin
(xii) Polysepalous
(xiii) Hypoxia
(xiv) A is true and R is false
(xv) Femur

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Solution 2

(i)

(a) Testa
(b) Skin
(c) ATP
(d) Congenital diseases
(e) Roughage

(ii)

Common name	Scientific name
1. Honeybee	c. *Apis indica*
2. Cobra	e. *Naja naja*
3. Onion	a. *Allium cepa*
4. China rose	b. *Hibiscus rosa sinensis*
5. Peacock	d. *Pavo cristatus*

(iii)

(a) True.
(b) True.
(c) True.
(d) False. (Sulphonamides are effective in treating bacterial diseases.)
(e) False. (DDT is a non-biodegradable waste.)

(iv)

(a) Differences between annelids and molluscs [mode of respiration]:

Annelids	Molluscs
Respiration occurs through moist skin.	Respiration occurs through lungs or gills.

(b) Differences between ciliated epithelium and columnar epithelium [location]:

Ciliated epithelium	Columnar epithelium
Present in the windpipe, kidney tubules and oviduct	Found in the inner lining of the stomach and intestine

(c) Differences between jaundice and mumps [mode of transmission]:

Jaundice	Mumps
Spreads through contaminated food and water	Spreads through contact from infected person to a healthy person

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(d) Differences between premolars and incisors [function]:

Premolars	Incisors
Used for masticating food	Used for cutting food

(e) Differences between air-borne and water-borne diseases [example]:

Air-borne disease	Water-borne disease
Tuberculosis	Jaundice

(v)

(a) Ribosome	Synthesis of proteins
(b) Centrosome	Cell division in an animal cell
(c) Haustoria	Absorption of food in parasites
(d) Epiglottis	Closes the glottis while swallowing of food
(e) Glenoid cavity	Articulation of humerus

SECTION B

Answer 3

(i) The energy liberated during respiration is stored in the form of ATP inside the cells. Some part of it is lost as heat to the surroundings.

(ii) Protoplasm cannot be analysed chemically because the chemical composition of protoplasm is very complex. It varies slightly from one cell to another, although the common elements such as carbon, hydrogen, oxygen, nitrogen, sulphur, iron, and phosphorus included in the composition of protoplasm are still the same in all the cells.

(iii) A tissue is a group of similar cells from the same origin that together carry out a specific function in the body. An egg is a zygote or a cell, but a cluster of eggs cannot be considered as a tissue. A group of tissues form an organ. However, a cluster of eggs does not form an organ. Instead, it gives rise to a new organism if the eggs get fertilised. Each egg has an individual function and the cluster of eggs do not function as a group. Therefore, we cannot consider a cluster of eggs as a tissue.

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(iv)

(a) <u>Long and feathery stigma</u> - Allows trapping of dispersed pollen grains in the wind and increases the adhesiveness of the attachment.

(b) <u>Smooth and light pollen</u> - Easily carried by wind and are characteristic of wind-pollinated plants.

(v)

(a) Germinated grams are considered highly nutritive because the cotyledon of the seed absorbs food from the endosperm. It is rich in carbohydrates and proteins in its outermost layer.

(b) Yes, we call it germination because all the changes that lead to the creation of a seedling are referred to as germination. The epicotyl or hypocotyl elongates during germination which is visible in the form of small shoots.

Answer 4

(i) Phylum, Class, Order, Family, Genus, Species

(ii) Spore formation in bacteria is not considered as a form of reproduction because the bacteria reproduce solely asexually through fission or cell division. Spore development is simply a means of evading adverse environment.

(iii)

(a) Balanced diet: A balanced diet is the one which contains all the principal constituents of food in proper quantities for a particular person.

(b) Malnutrition: Malnutrition is the condition in which a person suffers due to an unbalanced diet. It includes both deficiency as well as an excess of nutrients in a person's diet.

(iv) It is critical to thoroughly chew our meals since chewing aids in the breakdown of complex food molecules into simpler molecules. Chewing stimulates the salivary glands to produce saliva. The saliva moistens the food and forms a bolus which can be readily swallowed. Saliva also contains enzymes that aid in the breakdown of carbohydrates.

(v) A structure that has been moved by a muscle cannot be returned to its original place until another muscle acts on it. Such muscles causing opposing movements are called antagonistic muscles.

When you flex your arm above the elbow, the muscle above the upper arm, known as the biceps, can be seen, and felt bulging. As a result of contraction, this muscle shrinks in length, stiffens, and thickens. Biceps contraction pulls the forearm towards the upper arm. However, biceps relaxation cannot return the forearm to its former posture. When the arm is stretched or straightened, the triceps muscle, located near the back of the upper arm, contracts. To bend or flex and straighten the arm at the elbow, the two muscles operate antagonistically or in opposite ways.

Answer 5

(i) Modified sweat gland: Mammary gland

Modified sebaceous gland: Meibomian gland

(ii) It is important to know how the germs leave the body of a patient as there are some diseases and infections which are transmitted through air, water or just by direct contact. Therefore, to take precautions and protect others from further infections, it is important to know how the germs leave the body of an infected person.

(iii)

(a) Mammals

(b) Aves

(iv) Ciliated columnar epithelium is found in the tracheal lining. The free ends of this epithelium have thread-like extensions called cilia. The cilia are constantly lashing out and moving the materials that enter the trachea.

(v)

(a) Stamen (male reproductive part of the flower)
(b) Contents of the pollen sacs in figure B represent the male gametes.
(c) The contents of the pollen sacs would come out through agents like air, wind, and insects leading to pollination in flowers.

Answer 6

(i) Gaseous exchange continues in the lungs even during expiration because expiration is caused by the reverse motions of the ribs and the diaphragm. The thoracic cavity is reduced, and the lungs are squeezed because of rib and diaphragm motions, forcing air out into the atmosphere.

(ii) The skin limits energy loss from the body. It conserves body heat in cold weather and promotes heat loss in hot weather.

(iii) Muscles pull the structures together. A muscle has two ends - a fixed end that originates the muscle and a moveable end that pulls on another section. The movable end is drawn out to produce a robust structure linked to the bone known as a tendon. When a nerve stimulates a muscle, it contracts and gets shorter and thicker, pulling the bone at its movable end. Muscles can only contract and relax; they do not have the ability to lengthen.

(iv) Roughage is a type of dietary fibre that is mostly made up of cellulose. It cannot be digested by our bodies because it lacks cellulose-digesting enzymes.
Fruits and green leafy vegetables contain roughage.

(v) <u>Role of microorganisms in industrial production:</u>

a) Bacteria are used in the production of vinegar as well as processing of coffee, tobacco, and other products.
b) Certain microorganisms produce different flavours of tea, coffee, and other beverages.
c) Bacteria are utilised to produce antibiotics, enzymes, hormones, serum, vaccines, and toxoids on a massive scale.

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Answer 7

(i) Because the nose includes hair and mucous that trap dust and microorganisms, breathing through the nose rather than the mouth ensures that the inhaled air is pure, and the respiratory passage is free of dust and microorganisms.

(ii) Potable water can be contaminated in the following ways: *(Any two)*

1. Improper disposal of sewage
2. Defecation and urination near lakes, rivers, or ponds
3. Drainage of animal wastes and washings from dairies and poultries into water bodies

(iii)

Vaccines	**Diseases**
TAB vaccine	Typhoid
BCG vaccine	Measles
DPT vaccine	Diphtheria, Tetanus, and Pertussis (whooping cough)

(iv) Functions of World Health Organisation: *(Any two)*

1. To promote and support projects for research on diseases such as cancer.
2. To collect and supply information about the occurrence of epidemic diseases such as cholera, plague, typhoid, and yellow fever.
3. To suggest quarantine measures to prevent the spread of diseases to others.
4. To lay pharmaceutical standards for important drugs, to ensure purity and size of the dose.

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(v) Usefulness of waste incineration:

a) It minimises the weight of the waste.
b) It decreases the amount of garbage.
c) It converts harmful waste into less toxic or non-toxic waste.

Incineration safety precautions:

a) It should be done at extremely high temperatures.
b) It should be outfitted with pollution-control equipment.
c) It should be placed in an area away from residential zones.

Answer 8

(i) *Homo sapiens*

(ii) Both photosynthesis and respiration occur in green plants during the day. CO_2 evolution is used to show respiration in living organisms. CO_2 produced during plant respiration is consumed during photosynthesis, hence there is no CO_2 evolution. As a result, demonstrating respiration in green plants is challenging because there is no CO_2 evolution throughout the day.

(iii) Goose flesh is a distinctive roughness of the skin caused by cold or fear, in which the hair follicles rise erect, and form bumps on the skin.
Goose flesh develops when the erectors or arrector muscles at the base of the hair contract. The erector muscles are positioned obliquely between the hair follicle and the dermal layer. These are smooth muscles required for hair movement. The erector muscle contracts, pulling the hair vertical and depressing the skin, resulting in goose flesh.

(iv) <u>Adaptations in ileum for the absorption of digested food:</u>

- It is long to give additional surface area for absorption.
- It shows a large number of villi which increases the surface area even further.

(v) <u>Advantages of cross-pollination:</u>

- The offspring are healthier.
- The seeds that are generated are abundant and fertile.
- Cross-pollinating two different kinds of the same species might result in the production of new variations.

<u>Disadvantages of cross-pollination:</u>

- Pollination is not always guaranteed.
- Pollen must be produced in large quantities.
- The procedure is uneconomical for the plant because the flowers must be huge, colourful, fragrant, and generate nectar to attract pollinators.

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