ICSE 2025 EXAMINATION

Sample Question Paper - 4

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.)

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) Bacteria are no more classified as plants because

1. They are unicellular
2. They are microscopic
3. Many of them are parasitic
4. They do not have chlorophyll

(ii) **Assertion (A):** Leucoplasts are colourless plastids.
Reason (R): They impart colour to the flowers and fruits.

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) Annual rings are the number of

1. Internodes in a stem
2. Rings of vascular bundles in a monocot stem
3. Bark layers in a woody stem
4. Layers of xylem in a stem

(iv) The part of the flower that give rise to the seed is the

1. Ovary
2. Placenta
3. Ovule
4. Pollen grain

(v) **Assertion (A):** Maize is an albuminous seed.
Reason (R): In albuminous seeds, the endosperm is completely absorbed by its growing embryo.

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) 'X' is a cold-blooded animal. It has a three-chambered heart and horny scales on its skin. 'X' most likely belongs to Class

1. Amphibia
2. Reptilia
3. Pisces
4. Mammalia

(vii) Which of the following are fat-soluble vitamins?

1. A, D and E
2. B, C and D
3. B, D and E
4. A, B and C

(viii) Gastric juice contains

1. HCl and Pepsin
2. Pepsin and Trypsin
3. Trypsin and HCl
4. Amylopsin and Pepsin

(ix) External ear (pinna) is supported by the

1. Bone
2. Cartilage
3. Tendon
4. Capsule

(x) **Assertion (A):** Mammary glands are modified ceruminous glands.
Reason (R): They are present only in females.

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) Given below are few statements which describe a particular process in humans.

I. It is a catabolic process.
II. It results in loss in dry weight.
III. It is carried out by enzymes.

Based on the above description, identify the process.

1. Photosynthesis
2. Combustion
3. Respiration
4. Digestion

(xii) Ranjan has been suffering from vomiting and loose motions. There is very little or no urination due to shortage of water in the body. Which of the following diseases is Ranjan possibly suffering from?

1. Typhoid
2. Malaria
3. Dysentery
4. Cholera

(xiii) World Health Day is celebrated on

1. August 29
2. January 30
3. April 7
4. May 8

(xiv) The headquarters of World Health Organisation are located at

1. Geneva
2. Berlin
3. Paris
4. New York

(xv) **Assertion (A):** Scrubbers are devices used to remove only particulate air pollutants.
Reason (R): The air passing out of the scrubber is dust-free and clean.

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

Question 2

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

(a) A flower which contains all the four whorls.

(b) A plant in which male and female flowers are present on the same plant.

(c) The wax-like substance secreted by the ceruminous glands.

(d) A condition of united sepals.

(e) The cell organelle associated with the synthesis of proteins.

(ii) **Arrange and rewrite the terms in each group in the correct order so as to be in a logical sequence beginning with the term that is underlined.** [5]

(a) <u>Cervical,</u> Lumbar, Sacrum, Thoracic, Coccyx

(b) <u>Nostrils</u>, Alveoli, Larynx, Pharynx, Bronchioles

(c) <u>Pollen grain</u>, Embryo sac, Stigma, Ovary, Pollen tube

(d) <u>Pharynx</u>, Oesophagus, Duodenum, Stomach, Rectum

(e) <u>Cell wall</u>, Cytoplasm, Nucleolus, Cell membrane, Nuclear membrane

(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) Penicillin	1. Animal cells
(b) Cell wall	2. Supporting tissue
(c) Albinism	3. Antibiotic
(d) Centrosome	4. Plant cells
(e) Collenchyma	5. Skin pigmentation
	6. Conducting tissue
	7. Antiseptic

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

(a) Yeast, Rhizopus, Mucor, Spirogyra

(b) Butterfly, Housefly, Ant, Crab

(c) Acne, Black heads, Leukoderma, Pimples

(d) Beriberi, Scurvy, Goitre, Mumps

(e) Mouth, Stomach, Liver, Small intestine

(v) **State one point of difference between each of the following pairs:** [5]

(a) Cold-blooded and warm-blooded animals

(b) Self-pollination and cross-pollination

(c) Snake and earthworm

(d) Infectious and non-infectious diseases

(e) Inspired air and expired air

SECTION B

(Attempt any four questions from this section.)

Question 3

(i) Is the micropyle important for a seed? Give reason. [1]

(ii) Given below is a table of certain vaccines, the diseases against which they are used and the nature of vaccine. Fill up the gaps 1-4. [2]

Vaccine	**Disease(s)**	**Nature of Vaccine**
1. _____	Typhoid	Killed germs
Salk's vaccine	2. _____	3. _____
BCG	4. _____	Living weakened germs

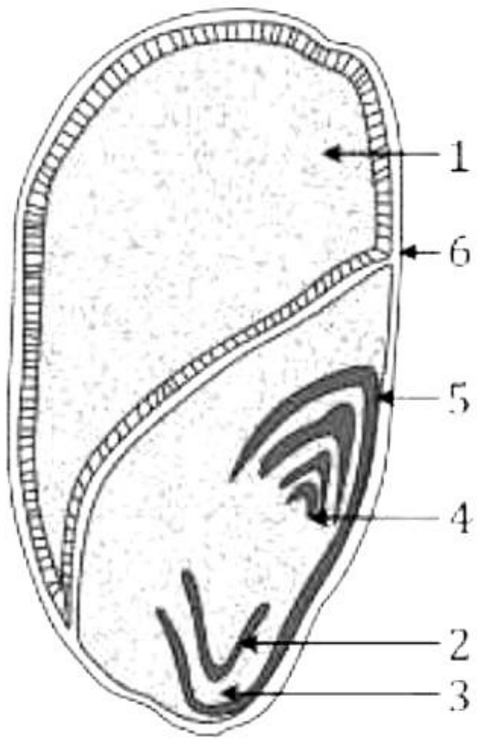
(iii) What are the functions of the following in breathing? [2]

(a) Ribs

(b) Abdominal muscles

(iv) State any two disadvantages of self-pollination. [2]

(v) The given figure shows the structure of a seed. [3]



(a) Label the parts 1-6.

(b) What is the special feature of this seed?

(c) Is it a monocot or a dicot seed? Give reason.

Question 4

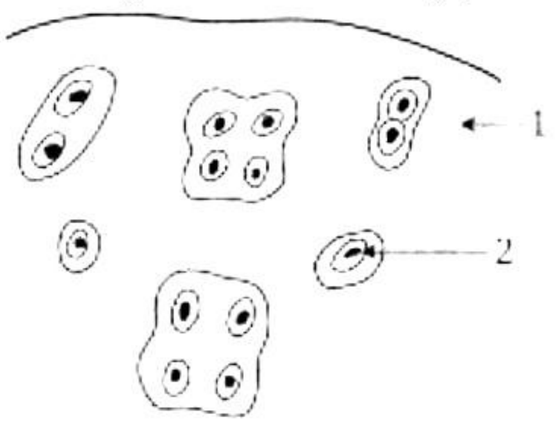
(i) Define incubation period. [1]

(ii) Give reason: Decalcified bones become soft and flexible. [2]

(iii) Why is the fertilisation process in angiosperms known as double fertilisation? [2]

(iv) How is oxygen debt created in the body? [2]

(v) The given figure shows a type of animal tissue. [3]



(a) Name the tissue.

(b) Label the parts 1 and 2.

(c) State the characteristics of this tissue.

Question 5

(i) Name two serum compounds produced by genetically modified bacteria. [1]

(ii) What will happen if the daily intake of food does not provide sufficient calories to a person? [2]

(iii) Draw a neat diagram of the 'Microscopic structure of an intestinal villus' and label the parts given below: [2]

1. Epithelium
2. Capillaries
3. Lacteals

(iv) What does STD stand for? Is syphilis an STD? [2]

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

(a) Label the parts 1-5.

(b) Name the structure shown in the given figure.

(c) Does this structure belong to androecium or gynoecium?

Question 6

(i) List the five derivatives of the skin. [1]

(ii) Identify the deficiency diseases with the help of the clues given below: [2]

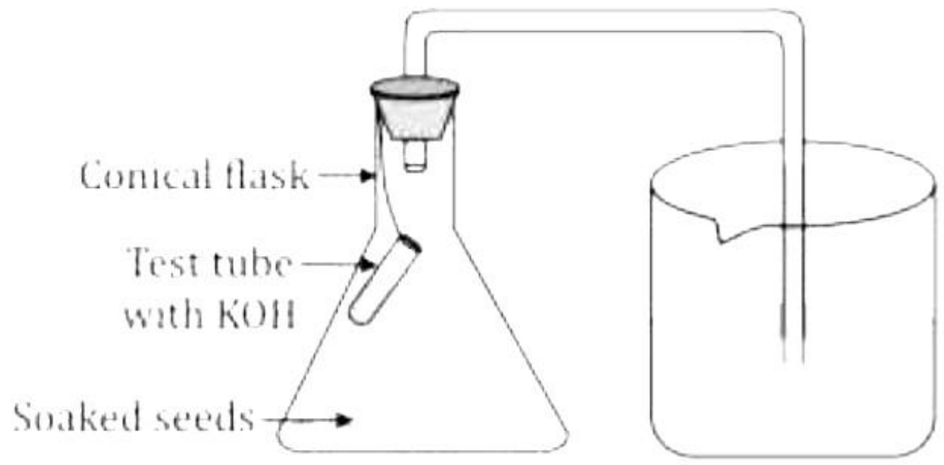
(a) Swelling of the thyroid gland in the neck region

(b) Dryness of the cornea and ulceration in the eye

(iii) What is the role of fats in our body? [2]

(iv) State two salient features of Phylum Protozoa. [2]

(v) The given figure represents an experimental set-up. [3]



(a) What is the aim of the given experiment?

(b) Why does water rise in the tube?

(c) Is there any control for this experiment? If so, mention it.

Question 7

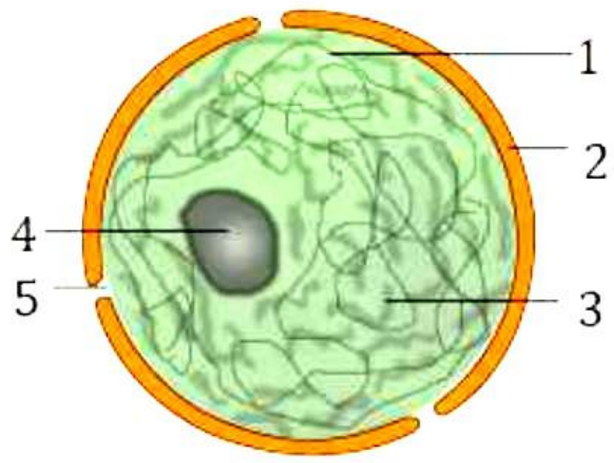
(i) Where is the least specialized tissue located in plants? [1]

(ii) List any two harmful effects of bacteria. [2]

(iii) State two functions of the mammalian skin other than those concerned with heat regulation. [2]

(iv) Why is public cleanliness important for individual health? [2]

(v) Study the given figure and answer the questions based on it: [3]



(a) Identify the organelle shown in the above figure.

(b) Label parts 1 - 5.

(c) List two functions of this organelle.

Question 8

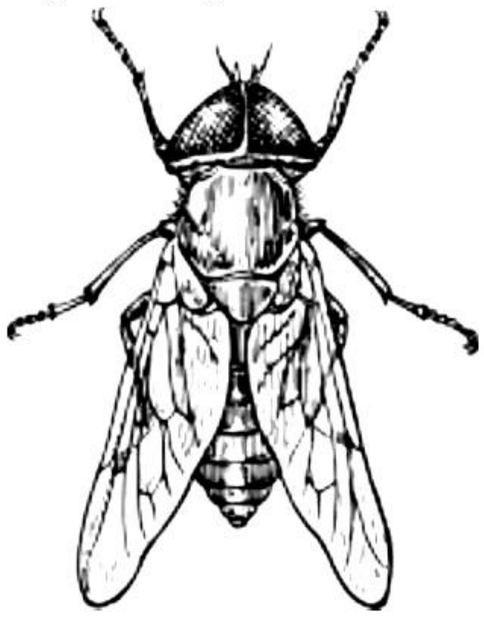
(i) Name the bones present in the arm. [1]

(ii) Can a cell survive if its cytoplasm is removed? Give reason for your answer. [2]

(iii) What is fly ash? State its importance. [2]

(iv) Give reason: A bat can fly, yet it is not a bird. [2]

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



(a) Name the insect.

(b) Name *any one* disease spread by this insect.

(c) How does it spread diseases?

Solution

SECTION A

Solution 1

(i) They do not have chlorophyll
(ii) A is true and R is false
(iii) Rings of vascular bundles in a monocot stem
(iv) Ovule
(v) A is true and R is false
(vi) Reptilia
(vii) A, D and E
(viii) HCl and Pepsin
(ix) Cartilage
(x) Both A and R are false
(xi) Respiration
(xii) Cholera
(xiii) April 7
(xiv) Geneva
(xv) A is false and R is true

Solution 2

(i)

(a) Complete/Perfect flower
(b) Monoecious plant
(c) Cerumen/Earwax
(d) Gamosepalous
(e) Ribosomes

(ii)

(a) Cervical, Thoracic, Lumbar, Sacrum, Coccyx
(b) Nostrils, Pharynx, Larynx, Bronchioles, Alveoli
(c) Pollen grains, Stigma, Pollen tube, Ovary, Embryo sac
(d) Pharynx, Oesophagus, Stomach, Duodenum, Rectum
(e) Cell wall, Cell membrane, Cytoplasm, Nuclear membrane, Nucleolus

(iii)

Column I	Column II
(a) Penicillin	3. Antibiotic
(b) Cell wall	4. Plant cells
(c) Albinism	5. Skin pigmentation
(d) Centrosome	1. Animal cells
(e) Collenchyma	2. Supporting tissue

(iv)

(a) Spirogyra (Rest are fungi)
(b) Crab (Rest belong to Class Insecta)
(c) Leukoderma (Rest are problems related to sebaceous glands)
(d) Mumps (Rest are non-infectious diseases)
(e) Liver (Rest are parts of the alimentary canal)

(v)

(a) Differences between cold-blooded and warm-blooded animals:

Cold-blooded animals	Warm-blooded animals
• Body temperature changes according to the surrounding temperature.	• Body temperature remains constant irrespective of the surrounding temperature.

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

Self-pollination	Cross-pollination
• Occurs within a single flower or between two flowers of the same plant.	• Occurs between two flowers of two different plants.

(c) Differences between snake and earthworm:

Snake	Earthworm
• Body covered with white scaly exoskeleton.	• Body is soft and made up of segments.

(d) Differences between infectious and non-infectious diseases:

Infectious diseases	Non-infectious diseases
• Can be transmitted from one person to another.	• Cannot be transmitted from one person to another.

(e) Differences between inspired air and expired air:

Inspired air	Expired air
• Contains more O_2.	• Contains more CO_2.

SECTION B

Solution 3

(i) Yes, the micropyle is important for the seed as the seeds obtain water and oxygen for germination through the micropyle.

(ii)

Vaccine	**Disease(s)**	**Nature of Vaccine**
1. TAB	Typhoid	Killed germs
Salk's vaccine	2. Poliomyelitis	3. Killed germs
BCG	4. Tuberculosis	Living weakened germs

(iii)

(a) Ribs: The ribs move inwards and outwards by the muscles stretched between them, thus enlarging the chest cavity all around.

(b) Abdominal muscles: Abdominal muscles help to increase the size of the thoracic cavity by the movement of the diaphragm and therefore, aid in inspiration.

(iv) Disadvantages of self-pollination: *(Any two)*

1. Continued self-pollination, generation after generation, may lead to the weakening of the variety or the species.
2. The weaker or defective characters of the variety or breed cannot be eliminated.
3. It does not yield new varieties.

(v)

(a) 1 – Endosperm
2 – Radicle
3 - Coleorhiza
4 – Plumule
5 – Coleoptile
6 - Aleurone layer

(b) The seed coat and the pericarp are fused together in the maize seed.

(c) It is a monocot seed. It contains only one scutellum.

Solution 4

(i) The period between the entry of germs into the body and the appearance of the first symptoms of a disease is called the incubation period.

(ii) A bone consists of both organic as well as inorganic constituents. Almost two-third of the entire bone mass is made of calcium and phosphorus. It gives strength and hardness to bones. When a bone is treated with weak hydrochloric acid, the inorganic salts in the bone get dissolved, and the organic framework is left behind. Such a bone is called decalcified bone. It is soft and flexible and can even be tied into a knot.

(iii) In angiosperms, one male nucleus (sperm nucleus) fuses with the polar nuclei to form the endosperm. The other male nucleus fuses with the egg nucleus to form an embryo. Since the process of fertilisation occurs twice, it is called double fertilisation.

(iv) During strenuous physical exercise, energy requirements exceed the supply of oxygen. Therefore, the muscles start respiring anaerobically and lactic acid is produced. Accumulation of lactic acid guides the feeling of fatigue. This condition is called 'oxygen debt'.

(v)

(a) Cartilage

(b) 1 – Matrix

2 - Chondroblast/Chondrocyte

(c) Cartilage is an elastic tissue. It supports the external ear and the nose.

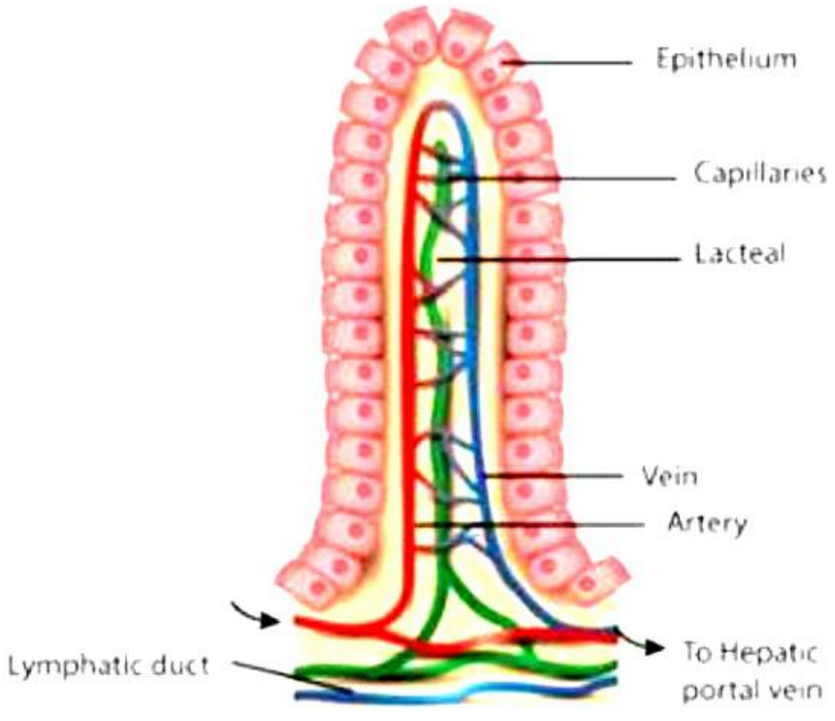
Solution 5

(i) <u>Two serum compounds produced by genetically modified bacteria:</u>

1. Blood clotting factor VIII for the treatment of Haemophilia A
2. Factor IX for the treatment of Haemophilia B

(ii) If the daily intake of food does not provide sufficient calories, a person would lose weight. In that situation, the existing food stores of the body would be oxidised and the capacity to do work would be reduced.

(iii) Microscopic structure of an intestinal villus:



(iv) 'STD' stands for Sexually Transmitted Disease. The causative organism of syphilis is *Treponema*. It grows in the genital tubes and causes a pus-like discharge. It spreads through sexual intercourse. Therefore, syphilis is an STD.

(v)

(a) 1 – Stigma
2 – Style
3 – Ovary
4 – Ovule
5 - Thalamus

(b) Carpel or pistil

(c) Gynoecium

Solution 6

(i) Derivatives of the skin:

1. Hair
2. Nails
3. Sebaceous glands
4. Sweat glands
5. Mammary glands

(ii)

(a) Goitre

(b) Xerophthalmia

(iii) Role of fats in our body:

- They help in the formation of the cell membrane.
- They help in absorption of fat-soluble vitamins.
- The layer of adipose tissue forms a shock absorbing structure around the organs.

(iv) Salient features of Phylum Protozoa: (*Any two)*

- They have a unicellular level of organisation.
- They are mostly aquatic (freshwater or marine).
- Their mode of nutrition is heterotrophic.
- They can be solitary, colonial, free-living, parasitic, or symbiotic.
- Their body shape can be irregular, spherical, oval, elongated or flattened.
- Their mode of locomotion can be with the help of pseudopodia, flagella, or cilia.

(v)

(a) The given experiment aims to show that respiration takes place in germinating seeds.

(b) Seeds use oxygen for respiration and a vacuum is created in the tube. As a result, the water rises in the tube.

(c) Yes. Another conical flask with the same experimental set-up can be used. But we must use boiled seeds, instead of germinating seeds.

Solution 7

(i) The least specialized tissue in plants is parenchyma. It is located in the stem, roots, and fruits of the plant.

(ii) <u>Harmful effects of bacteria:</u> *(Any two)*

1. Spoilage of food.
2. Causes several diseases in animals, humans, and plants.
3. Reduces soil fertility.

(iii) <u>Functions of the mammalian skin other than heat regulation:</u>

1. <u>Storage of food</u>: Skin acts as a storehouse of energy by storing reserve food in the form of fats in the hypodermis.
2. <u>Synthesis of Vitamin D</u>: Skin has the ability to synthesise small quantity of Vitamin D in the presence of sunlight.

(iv) Public cleanliness helps in preventing several deadly diseases which are quite common under unhygienic conditions. Public cleanliness should be practised everywhere including schools, workplaces, industries, and homes.

In addition to frequent hand washing, schools should instruct teachers to educate the students on the following hygiene practices:

- Cover the mouth and the nose with a tissue while coughing or sneezing.
- Cough or sneeze into your sleeve when a tissue is unavailable.
- Dispose of used tissues properly.
- Wash hands regularly and thoroughly.

(v)

(a) Nucleus

(b) 1 - Chromatin
2 – Nuclear membrane
3 - Nucleoplasm
4 – Nucleolus
5 – Nuclear pore

(c) <u>Functions of the nucleus:</u>
1. Regulates cell functions.
2. Contains chromosomes which contain genes that control hereditary characters.

Solution 8

(i) Humerus, radius, ulna, carpals, metacarpals, and phalanges are the six different types of bones present in the arm.

(ii) No, a cell cannot survive, if its cytoplasm is removed. This is because the cytoplasm is the site of many important chemical reactions. Different cell organelles are also embedded in the cytoplasm. So, if the cytoplasm is removed, organelles will not be able to function, and the cell will ultimately die.

(iii) Gaseous waste produced in cement industries consists of fly ash. It consists of fine solid particles of non-combustible ash carried out of a bed of solid fuel by a draft. It can be used for making a variety of building materials like bricks, concrete and roofing sheets.

(iv) A bat is a mammal. It is viviparous. It has mammary glands. It has external ears, and its body is covered with hair. On the other hand, birds are oviparous. Their body is covered with feathers. This is why although a bat can fly it is not a bird.

(v)

(a) Housefly

(b) Cholera

(c) The housefly sits on garbage or decaying organic matter. The disease-causing germs get transferred to the body of the fly. When the fly sits on eatables, germs spread to the eatables and when the eatables are consumed by man, they enter his body. In this way, the housefly spreads several infectious diseases.