

# ICSE 2025 EXAMINATION

## Sample Question Paper - 5

### Biology

**Time Allowed: 2 hours**

**Maximum Marks: 80**

**General Instructions:**

- Answers to this Paper must be written on the paper provided separately.
- You will not be allowed to write during first 15 minutes.
- This time is to be spent in reading the question paper.
- 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

1. **Question 1: Choose the correct answers to the questions from the given options. [15]**  
**(Do not copy the question, write the correct answers only.)**

(i) Which one of the following will not directly affect transpiration? [1]

- |               |                                  |
|---------------|----------------------------------|
| a) Wind speed | b) Temperature                   |
| c) Light      | d) Chlorophyll content of leaves |

(ii) Among the statements given below, select the most correct option associated with a cell [1]

- The smallest entity of the living organism
- The structural and functional unit of life
- The macroscopic unit of life
- Both (a) and (b)

- |               |               |
|---------------|---------------|
| a) Option (c) | b) Option (d) |
| c) Option (b) | d) Option (a) |

(iii) A reflex arc in man is best described as movement of stimuli from [1]

- a) receptor cell, spinal cord, motor neuron, relaying neuron      b) receptor cell, efferent nerve, relaying neuron, muscles of the body
- c) receptor cell, sensory neuron, relaying neuron, effector muscles      d) receptor cell, synapse, motor neuron, relaying neuron
- (iv) Compressed Natural Gas (CNG) is [1]
- a) butane      b) methane
- c) propane      d) ethane
- (v) Pulse wave is mainly caused by the [1]
- a) systole of the left ventricle      b) systole of atria
- c) diastole of atria      d) systole of the right ventricle
- (vi) **Assertion (A):** Ozone is both beneficial and damaging. [1]  
**Reason (R):** Stop the release of chlorofluorocarbons to protect the ozone.
- a) Both A and R are true and R is the correct explanation of A.      b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.      d) A is false but R is true.
- (vii) Which of the following is not a problem due to urbanisation? [1]
- a) Sanitation and sewage      b) Pollution
- c) Mental health diseases      d) Illiteracy
- (viii) The proximal convoluted tubule of a nephron is present in [1]
- a) Vasa recta      b) medulla
- c) ureter      d) cortex
- (ix) Among the following given options, which one should not act as a limiting factor for photosynthesis? [1]



- i. The process of uptake of mineral ions against the concentration gradient using energy from the cell. [1]
- ii. The waxy layer on the epidermis of the leaf meant to reduce transpiration. [1]
- iii. Lenticels and stomata (which one remains open always) [1]
- iv. A condition that results in abnormally long bones, long lower jaw bone due to the hypersecretion of a pituitary hormone. [1]
- v. Hormones that regulate the secretion of other endocrine glands. [1]

(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.**

- i. The statement given below is incorrect. Rewrite the correct statement by changing the underlined words of the statement. [1]  
The Graafian follicle, after ovulation turns into a hormone producing tissue called corpus callosum.
- ii. Deafness is caused due to the rupturing of the pinna. [1]
- iii. Soil water → root hair → cells of cortex → epidermis → xylem [1]
- iv. The cell sap of root hair is Hypotonic. [1]
- v. Cytoplasm : Cytokinesis : : Nucleus : \_\_\_\_\_ [1]

(iii) **Fill in the blanks with suitable words:**

- i. Copy and complete the following by filling in the blanks 1 to 5 with appropriate words. [5]

The human female gonads are ovaries. A maturing egg in the ovary is present in a sac of cells called (i)\_\_\_\_\_. As the egg grows larger, the follicle enlarges and gets filled with a fluid and is now called the (ii)\_\_\_\_\_ follicle. The process of releasing the egg from the ovary is called (iii)\_\_\_\_\_. The ovum is picked up by the oviduct funnel and fertilization takes place in the (iv)\_\_\_\_\_. In about a week the blastocyst gets fixed in the endometrium of the uterus and this process is called (v)\_\_\_\_\_.

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

- i. Bile, Urea, Uric acid, Ammonia [1]
- ii. Vasopressin, growth hormone, TSH, ACTH, FSH. [1]
- iii. Exophthalmic Goiter, Simple Goitre, Cretinism, Myxoedema [1]
- iv. Detergents, X-rays, Sewage, Oil spills [1]
- v. Formalin, Iodine, DDT, Lime [1]

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

- i. Match the following columns. [5]

Column I	Column II
(a) Liver	(i) Knot-like tuft of blood capillaries in Bowman's capsule.
(b) Skin	(ii) Breakdown of proteins.
(c) Kidney	(iii) Sweat glands.
(d) Glomerulus	(iv) Bean-shaped excretory organ.

### Section B

Attempt any 4 questions

3. **Question 3** [10]

- (i) The son of a haemophilic man may not get this genetic disorder. Mention the reason. [1]
- (ii) Briefly explain the sex-linked inheritance. [2]
- (iii) Differentiate between S-phase and G<sub>2</sub>-phase. [2]
- (iv) How many alleles of genes for X-linked traits are present in female and male individuals, respectively? [2]
- (v) Draw a well labelled diagram to show the anaphase stage of mitosis in an animal cell having four chromosomes. [3]

4. **Question 4** [10]

- (i) Briefly explain the term reflex action. [1]
- (ii) During a street fight between two individuals, mention the effects on the following organs by the autonomous nervous system, in the table given below (one has been done for you as an example). [2]

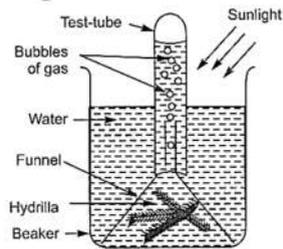
Organs	Sympathetic Nervous System	Parasympathetic Nervous System
Lungs	Dilates bronchi and bronchioles	Constricts bronchi and bronchioles
Pupil of the eye		
Salivary gland		

- (iii) Name the part of human brain which is concerned with the following [2]
- i. Seat of memory
  - ii. Coordinates muscular activity
- (iv) In what way sulci are different from gyri? [2]
- (v) Draw a well labelled diagram of a neuron showing the following parts: Dendrites, axon, node of Ranvier and myelin sheath. [3]

5. **Question 5** [10]

- (i) Name any two plants that do not perform photosynthesis. [1]
- (ii) Plants have several pigments that can catch light energy. Two of these are chlorophyll-a and chlorophyll-b, which harness light of different wavelengths. What advantage does a plant obtain by having molecules that act at different wavelengths? [2]
- (iii) What conditions enable RuBisCO to function as an oxygenase? Explain the ensuring process. [2]
- (iv) Name the end products of light reaction of photosynthesis. Mention the fate of each of them. [2]

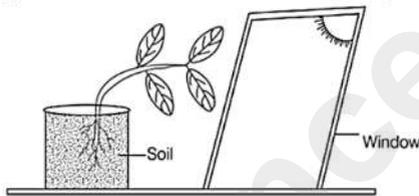
- (v) The figure given represents an experiment setup to study a physiological process in plants. [3]



- Name the physiological process being studied.
- What is the aim of the experiment?
- Give a well balanced equation to represent the process.

6. **Question 6** [10]

- What is the number of chromosomes in the gametes of human beings? [1]
- Differentiate between  $G_1$  and  $G_2$ -phase. [2]
- The diagram given below represents a plant growing in a glass jar. The glass jar is placed near a window. Study the diagram and answer the questions that follows: [3]

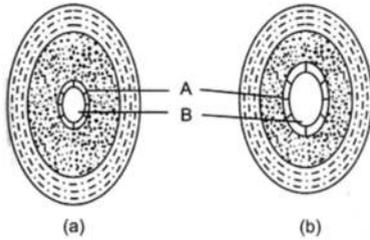


- Name the tropic movements shown by the shoot and roots.
- What is the stimulus that made the shoot bend towards the window?
- Which plant hormone caused the above effect?

7. **Question 7** [10]

- Briefly explain Lamarck's theory of use and disuse of organs. [1]
- Explain Darwin's concept of natural selection. [2]
- Describe Lamarck's theory of evolution. [2]
- Some great authors has said that a population explosion is far more dangerous than an atomic explosion. Justify this statement. [2]

- (v) The diagram given alongside show the cross section of two kinds of blood vessels. [3]

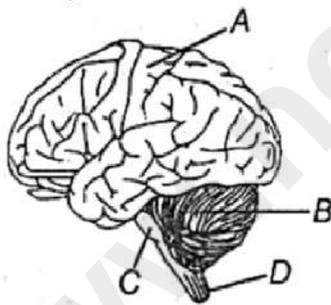


- Identify the blood vessels A and B. In each case give a reason to support your answer.
- Name the parts numbered A and B.
- When are the sound **Lubb** and **Dubb** produced during a heartbeat?

8. **Question 8**

[10]

- State the main function of the lenticel. [1]
- Mention the two fluids that circulate in the body. [2]
- What are the sources of radioactive waste? [2]
- The following diagram represents the human brain as seen in an external view. [3]  
Study the same and then answer the questions that follow:



- Name the part labelled A, B, C and D.
- Mention the difference in the arrangement of the nerve cells in the parts marked A and D.
- Name the sheet of nerve fibres that connect the two halves of the part labelled A.

# Solution

## Section A

1. Question 1: Choose the correct answers to the questions from the given options. (Do not copy the question, write the correct answers only.)

(i) **(d)** Chlorophyll content of leaves

**Explanation:** {

Chlorophyll content of leaves

(ii) **(b)** Option (d)

**Explanation:** {

a. The smallest entity of the living organism

b. The structural and functional unit of life

(iii) **(c)** receptor cell, sensory neuron, relaying neuron, effector muscles

**Explanation:** {

A reflex arc in man is best described as the movement of stimuli from receptor cell, sensory neuron, relaying neuron, effector muscles

(iv) **(b)** methane

**Explanation:** {

methane

(v) **(a)** systole of the left ventricle

**Explanation:** {

systole of the left ventricle

(vi) **(b)** Both A and R are true but R is not the correct explanation of A.

**Explanation:** {

Ozone is damaging as it is a deadly poison. It is beneficial as it shields the surface of the earth from UV radiations of the Sun. We should stop the release of Chlorofluorocarbons (CFCs) to protect the ozone.

(vii) **(c)** Mental health diseases

**Explanation:** {

Mental health diseases

(viii) **(d)** cortex

**Explanation:** {

cortex

(ix)(d) Oxygen

**Explanation:** {

Oxygen

(x) (c) fimbriae

**Explanation:** {

Finger-like projections of the oviduct funnel are called fimbriae.

(xi)(c) 8 chromosomes

**Explanation:** {

8 chromosomes

(xii)(a) growth hormone of adenohypophysis

**Explanation:** {

growth hormone of adenohypophysis

(xiii)(d) DDT

**Explanation:** {

DDT

(xiv)(c) chloroplast

**Explanation:** {

chloroplast

(xv)(a) synapse

**Explanation:** {

Synapse is the point of contact between the terminal branch of the axon of a neuron with the dendrites of other neuron.

## 2. Question 2

(i) Name the following:

i. 1. Active transport

ii. 1. Cuticle

iii. 1. Lenticels

iv.

v. 1. Tropic hormones

(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.

i. The Graafian follicle, after ovulation turns into a hormone producing tissue called Corpus luteum.

ii. Deafness is caused due to the rupturing of the eardrum (tympanic membrane).

iii. **Incorrect term:** Epidermis

**Correct term:** Endodermis

iv. Hypertonic

v. Karyokinesis

(iii) Fill in the blanks with suitable words:

i. (i) follicle, (ii) graafian, (iii) ovulation, (iv) fallopian tube/oviduct/uterine tube, (v) implantation

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

i. **Odd term:** Bile

**Category:** Nitrogenous wastes/Excretory substances

ii. **Odd one:** Vasopressin (Secreted by posterior pituitary).

**Category:** All other hormones are secreted by anterior lobe of pituitary gland.

iii. **Odd term:** Exophthalmic Goiter

**Category:** Hypothyroidism: Under secretion of thyroxine causes these diseases.

iv. **Odd Term :** X-rays

**Category:** Water pollutants

v. **Odd term:** Iodine

**Category:** Disinfectants

(v) Match the items given in Column I with the most appropriate ones in Column II and rewrite the correct matching pairs.

i. (a) - (iii), (b) - (iv), (c) - (v), (d) - (ii)

### Section B

3. Question 3

(i) The gene responsible for haemophilia is located on X-chromosome and males have only single copy of X-chromosome with no alternative normal allele. That's why the son of a haemophilic man may not get this genetic disorder.

(ii) Sex-linked inheritance is the appearance of a trait which is due to the presence of an allele exclusively located on X-chromosome or Y-chromosome. This can be classified into two types X-linked inheritance and Y-linked inheritance.

(iii)

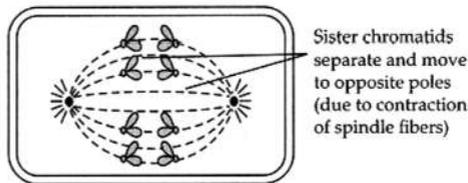
<b>S-phase</b>	<b>G<sub>2</sub>-phase</b>
It is called a synthetic phase.	It is called the pre-mitotic phase.

Replication of DNA occurs.	RNA of all three types and proteins precursors of asters and spindle are synthesised in it.
It lasts for 6-8 hours	It lasts for 2-5 years.

(iv) For each gene corresponding to X-linked traits, females always have two alleles since they have two X-chromosomes.

Males only have one allele of genes related to X-linked traits, since they have only one X-chromosome.

(v) Anaphase stage of mitosis in animal cell is given below:



#### 4. Question 4

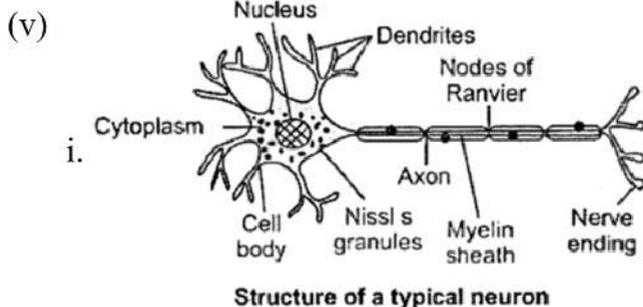
(i) Reflex action is the spontaneous, automatic, involuntary response to a stimulus.

Organs	Sympathetic Nervous System	Parasympathetic Nervous System
Lungs	Dilates bronchi and bronchioles	Constricts bronchi and bronchioles
Pupil of the eye	Dilates Pupil	Constricts Pupil
Salivary gland	Inhibits salivary glands and digestive glands	Stimulate salivary glands and digestive glands

(iii) i. Part associated with seat of memory is cerebrum of the brain.

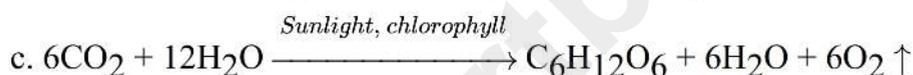
ii. The part that coordinates muscular activity is cerebellum of the brain.

(iv) The cortex of the cerebrum is covered by a number of small, deep and shallow folds called sulci whereas, the convolutions of the brain, i.e. larger grooves (folds) that cover the cortex of the cerebrum is called gyri.



### 5. Question 5

- (i) Cuscuta and Mushroom.
- (ii) Chlorophyll has various pigments like a and b. These pigments have a tendency to absorb different light or different wavelengths. Thus, this characteristic feature of various pigments of chlorophyll makes them most effective for photosynthesis.
- (iii) Carboxylation is the most crucial step of the Calvin cycle, where CO<sub>2</sub> is utilised for the carboxylation of RuBisCO. This reaction is catalysed by the enzyme RuBP carboxylase which results in the formation of 2 molecules of 3PGA. Since, this enzyme also has an oxygenation activity, it would be more correct to call it RuBP carboxylase-oxygenase or RubBisCO.
- (iv) ATP, NADPH, and oxygen are the products of the light reaction of photosynthesis. ATP and NADPH are used in the reduction step of biosynthetic phase of photosynthesis. Oxygen is liberated into the atmosphere.
- (v) a. The process being studied in the above experiment is photosynthesis.  
b. The aim of this experiment is to prove that oxygen is released during photosynthesis.



### 6. Question 6

(i) 23

(ii)	<b>G<sub>1</sub>-phase</b>	<b>G<sub>2</sub>-phase</b>
	It is called the first growth period.	It is a post-synthetic phase.
	Its duration is variable.	It lasts for 2-5 years.
	Cells grow in size.	Cell prepares to go into the mitotic phase.

- (iii) a. The tropic movements are phototropism by shoots and geotropism by roots.  
b. Light is the stimulus that made the shoot bend towards the window.  
c. Auxin causes the above effect.

### 7. Question 7

- (i) If an organ is constantly used it would be better developed whereas disuse of organ results in its degeneration.
- (ii) According to Darwin's concept of natural selection, the organisms, which are provided with favourable variations would survive because they are fittest to face their surrounding,

while the organisms, which are unfit for surrounding variations are destroyed.

- (iii) **Lamarck's Theory:** It is known as theory of inheritance of acquired characters. According to this theory, organisms undergo certain changes to adapt themselves to the environment. These characters acquired by an organism during its lifetime, are passed on to the progeny, e.g. the long neck of giraffe was explained by Lamarck, as an outcome of these animals having to stretch their necks constantly to eat the leaves on the upper branches of the trees.
- (iv) Population explosion leads to the depletion of natural resources and per capita income, fall in general health and many other problems. Therefore, the authors are justified in saying that a population explosion is far more dangerous than an atomic explosion.
- (v) a. Blood vessel labelled A is the artery because it has a narrow lumen and thick muscular wall and the blood vessel labelled B is vein because it has wide lumen and thin muscular wall.
- b. The parts labelled A and B are endothelium and lumen respectively.
- c. Lubb sound is produced when tricuspid and mitral valves get closed while Dubb sound is produced when pulmonary and aortic semilunar valves get closed.

#### 8. Question 8

- (i) They allow diffusion of gases for respiration and photosynthesis. / diffusion of  $O_2$  /  $CO_2$ .
- (ii) Two fluids that circulate in the body are
- Blood is a fluid connective tissue which is found circulating inside the body. It is bright red in colour.
  - Lymph is the tissue fluid, that flows in the lymph vessels. It is a colourless fluid.
- (iii) Sources of radioactive waste are as follows
- Accidental leakage of nuclear material or radiations from nuclear power plants.
  - Improper disposal of nuclear or radioactive waste.
- (iv) a. Parts labelled from A to D are as follows:
- A - Cerebrum
  - B - Cerebellum
  - C - Medulla oblongata
  - D - Spinal cord.
- b. In part, A(cerebrum) -Grey matter found outside and white matter is inside.  
In part D(spinal cord) -white matter is outside and grey matter is inside.
- c. Corpus callosum is the bundle of nerve fibres that connect the two halves of the parts labelled A (cerebral hemispheres).