

ICSE 2025 EXAMINATION

Sample Question Paper - 3

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 does not affect the rate of transpiration? [1]

a) Humidity

b) Wind

c) Light

d) Age of the plant

(ii) Cells which are not dividing are likely to be at: [1]

a) S phase

b) G₁

c) G₂

d) G₀

(iii) A synapse is found between [1]

a) All of these

b) dendrite and axon terminal

c) dendrite and dendrite

d) axon terminal and axon terminal

(iv) Compressed Natural Gas (CNG) is [1]

a) butane

b) methane

c) propane

d) ethane

(v) A muscular wall is absent in:

[1]

a) Arteriole

b) Capillary

c) Vein

d) Venule

(vi) **Assertion (A):** Ozone is very important layer of atmosphere.

[1]

Reason (R): Ozone protects the living organisms from harmful UV radiation of sun.

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) Surgical method of sterilization in a woman involves cutting and tying of:

[1]

a) Oviduct

b) Uterus

c) Urethra

d) Ureter

(viii) The structural and functional unit of excretion in the human kidney is the:

[1]

a) Nephron

b) Ureter

c) Bowman's capsule

d) Renal pelvis

(ix) A destarched plant is one whose

[1]

a) Plant is free from starch.

b) Leaves are free from chlorophyll

c) Aerial parts are free from starch

d) leaves are free from starch

(x) Fertilisation is the process of fusion of male gamete and the female gamete to produce a/an:

[1]

a) embryo

b) infant

c) child

d) zygote

- (xi) DNA is made up of sugar, mainly [1]
a) fructose b) hexose
c) triose d) pentose
- (xii) Pancreas acts as [1]
a) holocrine gland b) exocrine gland
c) endocrine gland d) Both exocrine and endocrine gland
- (xiii) The prime source of chlorofluorocarbon is [1]
a) Domestic sewage b) Industrial effluents
c) Refrigeration equipments d) Vehicular emission
- (xiv) NADP is expanded as [1]
a) Nicotinamide Adenine Dinucleolus Phosphate b) Nicotinamide Adenosine Dinucleolus Phosphate
c) Nicotinamide Adenosine Dinucleoside Phosphate d) Nicotinamide Adenine Dinucleotide Phosphate
- (xv) Chemicals that are released at the synaptic junction are called [1]
a) cerebrospinal fluid b) hormones
c) neurotransmitters d) lymph

2. **Question 2** [25]

- (i) **Name the following:**
- i. A solution that causes water to move into the cell and swelling up. [1]
- ii. Loss of water as droplets through leaves of an intact plant is termed (bleeding, guttation, transpiration). [1]
- iii. The waxy layer on the epidermis of the leaf meant to reduce transpiration. [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. Given below are sets of five terms each. Rewrite the terms in correct order in a logical sequence beginning with the first word that is underlined: [1]

Conjunctiva, Yellow spot, Pupil, Vitreous Humour, Aqueous Humour.

iii. Osmosis is active transport of molecules in cells. [1]

iv. Soil water → root hair → cells of cortex → epidermis → xylem [1]

v. Adenine : Thymine :: Cytosine : _____ [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. Cortisone, somatotropin, adrenocorticotrophic hormone, vasopressin [1]
- iv. Polythene bag, Crop residue, Animal waste, Decaying vegetable. [1]
- v. Detergents, X-rays, Sewage, Oil spills [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 sex of the child depends upon its father. Explain. [1]
- (ii) In a cross between a pure breed, red-eyed female fruitfly and a white-eyed male, what percentage of the male offsprings will have white eyes? (White eyes are X-linked, recessive). [2]
- (iii) Mention the differences between mitosis and meiosis with reference to [2]
 - i. Number of daughter cells formed at the end of cell division.
 - ii. The number of chromosome received
- (iv) Explain briefly: [2]
 - i. Mutation
 - ii. Homologous chromosomes
 - iii. Alleles

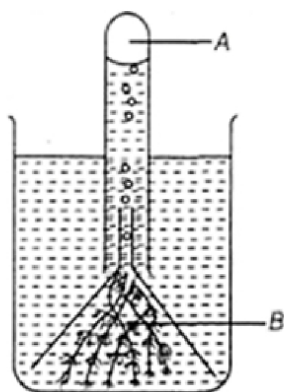
- (v) Draw a well labelled diagram to show the anaphase stage of mitosis in an animal cell having four chromosomes. [3]

4. Question 4 [10]

- (i) Explain how the human eye adapts itself to bright light and dim light. [1]
- (ii) Explain, what does nervous system consist of? [2]
- (iii) Explain the mechanism of focusing the image of a distant object in our eye when we raise our head after reading a book. [2]
- (iv) Compare the Central Neural System (CNS) and Peripheral Neural System (PNS). [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) Give one example of the following: [1]
An aquatic plant used in the lab to demonstrate oxygen liberation during photosynthesis.
- (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) Draw a simple labelled diagram of a stomatal apparatus as seen in surface view. [2]
- (v) The following diagram demonstrates a physiological process taking place in green plants. The whole set-up was placed in bright sunlight for several hours. [3]



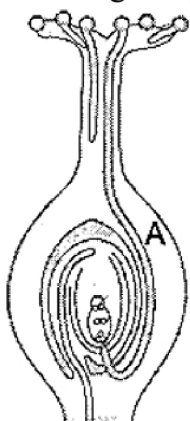
Study the diagram and answer the questions that follows:

- What aspect of the physiological process is being examined?
- Label the parts A and B in the diagram.
- Write a well-balanced chemical equation for the physiological process explained in (b) above.

6. Question 6

[10]

- Write the number of chromosomes present in a nerve cell of a human being. [1]
- What happens when a normal cell turns into a malignant cell? [2]
- The diagram given below represents a plant movement. [3]



- Explain the tropic movement mentioned in (a).
- Name the tropic movement shown in the diagram.
- Label the part marked A.

7. Question 7

[10]

- Given below are two stages in the evolution of man. Study them and answer the questions that follow: [1]

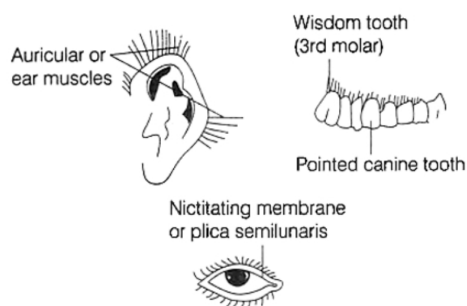


Identify Australopithecus and Neanderthal man from the above pictures.

(ii) Name the ancestors of man based on the features given below [2]

- i. Human-like meat eater with 900 cc brain, lived in Java.
- ii. More human with brain size 1400 cc, lived in Central Asia, used hides and buried their dead.
- iii. Human-like, vegetarian, with brain capacity between 650 cc and 800 cc.

(iii) Given below are the few structures of human body. [2]

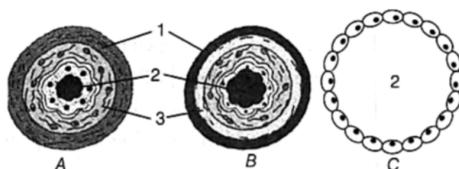


- i. What do these structures called?
- ii. Give any two characteristics of these structures.

(iv) List the effects of following on human population of an area [2]

- i. Immigration
- ii. Emmigration

(v) The diagrams given below are cross-sections of blood vessels [3]

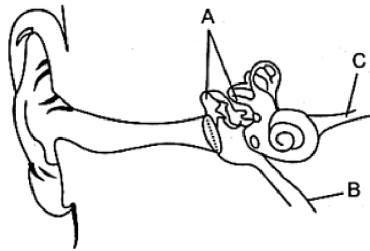


- a. Identify the blood vessels A, B and C.
- b. Name the parts labelled 1 to 3.

c. Mention one structural difference between A and B.

8. **Question 8** [10]

- (i) How does most of the water move within the root? [1]
- (ii) What is the significance of time gap in the passage of impulse from sino-atrial node to the ventricle? [2]
- (iii) A village is located near a bank of river. There an industrial setup started in village near river. After the industrial setup, the health of people becomes low. Why? Please explain. [2]
- (iv) Given below is the diagram of the human ear. Study the same and answer the questions that follow: [3]



- a. Name the part labelled **B** and state its function.
- b. Name the part labelled **C** and state its function.
- c. Give the function of ear wax.

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)** Age of the plant

Explanation: {

Age of the plant

(ii) **(d)** G_0

Explanation: {

G_0 phase or quiescent stage. It occurs due to the non-availability of nitrogen and energy-rich compounds.

(iii) **(b)** dendrite and axon terminal

Explanation: {

Synapse, also called neuronal junction, is the site of transmission of electric nerve impulses from between the dendrite and axon terminal.

(iv) **(b)** methane

Explanation: {

methane

(v) **(b)** Capillary

Explanation: {

Capillary

(vi) **(a)** Both A and R are true and R is the correct explanation of A.

Explanation: {

Both A and R are true and R is the correct explanation of A.

(vii) **(a)** Oviduct

Explanation: {

The surgical procedure is tubal ligation, in which the oviduct (fallopian tube) is cut or sealed.

(viii) **(a)** Nephron

Explanation: {

Nephron

(ix)(d) leaves are free from starch

Explanation: {

leaves are free from starch

(x) (d) zygote

Explanation: {

zygote form by fusion of male and female gamete.

(xi)(d) pentose

Explanation: {

pentose

(xii)(d) Both exocrine and endocrine gland

Explanation: {

Both exocrine and endocrine gland

(xiii)(c) Refrigeration equipments

Explanation: {

Refrigeration equipments

(xiv)(d) Nicotinamide Adenine Dinucleotide Phosphate

Explanation: {

Nicotinamide Adenine Dinucleotide Phosphate

(xv)(c) neurotransmitters

Explanation: {

Chemicals that are released at the synaptic junction are called **neurotransmitters**. A synapse is a junction present between two neurons.

2. Question 2

(i) Name the following:

i. 1. Hypotonic

ii. 1. Guttation

iii. 1. Cuticle

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. Conjunctiva, Pupil, Aqueous Humor, Vitreous Humor, Yellow Spot

iii. Osmosis is passive transport of molecules in cells.

iv. **Incorrect term:** Epidermis

Correct term: Endodermis

v. Guanine

(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** - Cortisone

Category - Pituitary hormone.

iv. Odd term - Polythene bag

Category - Biodegradable wastes

v. Odd Term : X-rays

Category: Water pollutants

(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) Sex chromosomes of female are homozygous (XX) while in male it is heterozygous (XY).

If a sperm bearing X-chromosome fertilizes with the ovum, XX zygote formed is a female child. If a sperm bearing Y-chromosome fertilizes with the ovum, XY zygote formed is a male child. So the sex of a child depends upon its father.

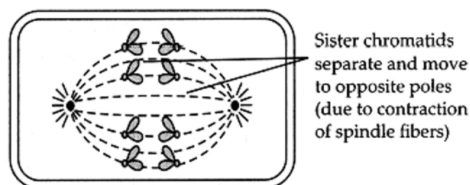
(ii) 0%. All the males and females will be red-eyed. Pure breed female (XX) is homozygous for normal X-chromosome. White-eyed male (X^oY) is hemizygous for X-chromosome with a white eye mutation.

		Sperm	
		X ^o	Y
Egg	X	XX ^o	XY
	x	XX ^o	XY

Both male and female offsprings will inherit a normal X-chromosome from the female.

(iii)	i.	Mitosis	Meiosis
		Two daughter cells are produced at the end of cell division	Four daughter cells are produced at the end of cell division.
ii.		Mitosis	Meiosis
		Daughter cells receive full set of chromosomes, i.e. diploid (2n) number of chromosomes.	Daughter cells receive only half the number of chromosomes, i.e. haploid (n) number of chromosomes.

- (iv) i. Mutation is a rare, random, discontinuous inheritable change in the genetic material of an organism.
- ii. A pair of chromosomes of the same size and shape bearing corresponding genes governing the same set of traits.
- iii. Alleles or allelomorphs are various forms of gene or mendelian factor which occurs on the same locus on homologous chromosomes and control the same character. They control different expressions or traits of the same character (e.g., tallness and dwarfness in Pea).
- (v) Anaphase stage of mitosis in animal cell is given below:



4. Question 4

- (i) **Bright light:** Pupils constrict, Rhodopsin is bleached.
Dim light: Pupils dilate, Rhodopsin is regenerated.
- (ii) The nervous system consists of
- Central Nervous System (CNS):** It comprises brain and spinal cord.
 - Peripheral Nervous System (PNS):** It comprises cranial and spinal nerves.

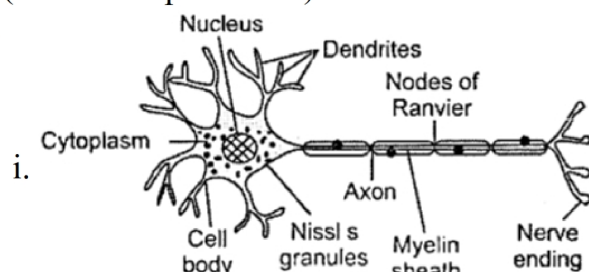
iii. **Autonomic Nervous System (ANS):** It comprises parasympathetic and sympathetic nerves.

(iii) While reading a book (near by vision), the lens of our eye is more convex or rounded but when we focus our eye on a distant object, the ciliary muscles are relaxed.

The lens becomes concave or flattened. This accommodation power of eye enables us to have a clear vision of objects at varying distances.

(iv) The CNS includes the brain and the spinal cord and is the site of information processing and control. The PNS comprises of all the nerves of the body associated with the CNS (brain and spinal cord).

(v)



Structure of a typical neuron

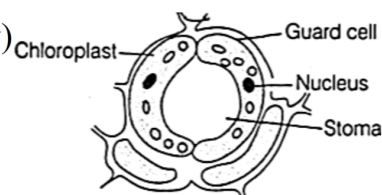
5. Question 5

(i) Hydrilla.

(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 CO₂ 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.

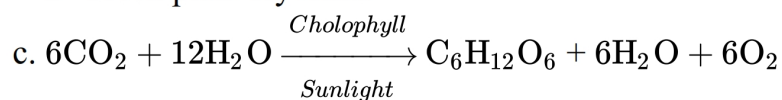
(iv)



(v) a. Release of O₂ in photosynthesis is being examined in the experiment.

b. A-Oxygen in a test tube.

B-Green plant Hydrilla.



6. Question 6

- (i) All the cells of the body except gamete cells contain 46 (23 pairs) of chromosome. The nerve cell of human beings are somatic cells and hence contain 46 chromosome.
- (ii) Cells usually stop dividing after certain number of divisions. In malignant or cancerous cells this automatic stoppage of cell division does not work. As a result malignant cells keep on dividing endlessly causing tumour or the cancerous growth.
- (iii) a. The tropic movement mention in (a) is Chemotropism.
 - b. The growth or movement of a plant or part of plant in response to a chemical stimulus is called chemotropism.
 - c. The part marked A is Pollen tube.

7. Question 7

- (i) a. Australopithecus
 - b. Neanderthal man
- (ii) i. Homo erectus
 - ii. Neanderthal man
 - iii. Homo habilis
- (iii) i. These structure are called vestigial organs.
 - ii. These are present in reduced or ruminant form in human body. They do not perform any function.
- (iv) i. Immigration is the permanent movement of people from outside to an area thus, it increases the population.
 - ii. Emmigration involves permanent movement of people from one area to another. It has negative (decreasing) impact on population.
- (v) a. The blood vessel A, B and C are
 - A - Artery
 - B - Vein
 - C - Capillary
- b. 1 - Tunica adventitia
 - 2- Lumen
 - 3 - Tunica media
- c. The structural difference between A and B is

A (Artery)	B (Vein)
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They have narrow lumen and valves are absent.	They have widen lumen and valves are present.
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8. Question 8

- (i) By transpiration pull, cohesion and adhesion property of water molecules.
- (ii) The time gap in the passage of impulse from sino-atrial node to the ventricles allows ventricles to relax. Fall in the ventricular pressure, results in the closing of semilunar valves which prevents the backflow of blood into the ventricles.
- (iii) Industrial setup near bank of river disposes its wastes. These wastes are accumulated in aquatic animals which are later eaten up by humans. Thus, the health of such humans becomes degraded and they may suffer from severe nervous system problems.
- (iv) a. Part 'B' is called a eustachian tube which acts as a ventilator to equalize the pressure of air on both sides of the tympanic membrane that forms the outer boundary of the middle ear.
 - b. Part 'C' is the auditory nerve (vestibular and cochlear nerve) which carries hearing impulses to the brain.
 - c. Ear wax helps to lubricate the tympanum for proper functioning.