

The Council has released specimen papers for March 2023 examination. A new examination pattern has been proposed wherein 40 marks are allotted to Section A and 40 marks to Section B. Please note the suggested changes in the number of questions and their marks in the solved specimen paper given below as well as in the Model Question Papers given ahead.

ICSE 2023 EXAMINATION
SPECIMEN QUESTION PAPER
BIOLOGY
(SCIENCE PAPER - 3)

Maximum Marks: 80

Time allowed: Two hours

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 I I.

SECTION A

*(Attempt **all** questions from this Section.)*

QUESTION 1

Select the correct answers to the questions from the given options. (Do not copy the question. Write the correct answer only) : **[15]**

(i) A muscular wall is absent in :

- (a) Capillary (b) Arteriole (c) Venule (d) Vein

Ans. (a) Capillary

(ii) On which day of the menstrual cycle does ovulation take place ?

- (a) 1st day (b) 5th day (c) 14th day (d) 28th day

Ans. (c) 14th day

(iii) Ganong's Potometer is used to study :

- (a) Photosynthesis (b) Rate of uptake of water (c) Exosmosis (d) Guttation

Ans. (b) Rate of uptake of water

(iv) The number of chromosomes in a human skin cell are :

- (a) 22 (b) 23 (c) 44 (d) 46

Ans. (d) 46

(v) Cretinism and Myxoedema are due to :

- (a) Hypersecretion of thyroxine (b) Hypersecretion of growth hormone
(c) Hyposecretion of thyroxine (d) Hyposecretion of growth hormone

Ans. (c) Hyposecretion of thyroxine

(vi) Light dependent phase of photosynthesis in green leaves takes place in :

- (a) Grana of chloroplast (b) Stroma of chloroplast
(c) Nucleus of palisade cells (d) Cytoplasm of palisade cells

Ans. (a) Grana of chloroplast

(vii) An example of a biodegradable substance is :

- (a) Aluminium (b) Paper (c) Plastic (d) Steel

Ans. (b) Paper

(viii) The part that is cut in Vasectomy is :

- (a) Urethra (b) Oviduct (c) Fallopian tube (d) Vas deferens

Ans. (d) Vas deferens

(ix) Gestation period of human foetus is :

- (a) 40 days (b) 280 days (c) 280 weeks (d) 40 months

Ans. (b) 280 days

(x) The part of the human eye where the rods and cones are located is :

- (a) Iris (b) Retina (c) Sclera (d) Choroid

Ans. (b) Retina

(xi) Organ of Corti is present in :

- (a) Utriculus (b) Sacculus (c) Cochlea (d) Incus

Ans. (c) Cochlea

(xii) The outermost covering of the brain is :

- (a) Arachnoid (b) Piamater (c) Pericardium (d) Duramater

Ans. (d) Duramater

(xiii) Cytokinins are predominantly present in :

- (a) Meristematic tissues (b) Permanent tissues (c) Endodermis (d) Epidermis

Ans. (a) Meristematic tissues

(xiv) Marine fish when placed in tap water bursts because of :

- (a) Diffusion (b) Plasmolysis (c) Endosmosis (d) Exosmosis

Ans. (c) Endosmosis

(xv) Urine is carried from kidney to urinary bladder by :

- (a) Uterus (b) Urethra (c) Umbilical cord (d) Ureter

Ans. (d) Ureter

QUESTION 2

(i) Name the following :

[5]

- (a) The suppressed allele of a gene.

Ans. Recessive gene

- (b) The knot like mass of blood capillaries in Bowman's capsule.

Ans. Glomerulus

- (c) The mineral element required for the synthesis of thyroxine.

Ans. Iodine

- (d) One gaseous compound that depletes the ozone layer.

Ans. Chlorofluorocarbons (CFCs)

- (e) The statistical study of human population.

Ans. Demography

(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) Soil water, Xylem, Root hair, Cortex

Ans. Soil water → Root hair → Cortex → Xylem



(b) Tympanum, Incus, Malleus, Stapes

Ans. Tympanum → Malleus → Incus → Stapes

(c) Pulmonary Vein, Left Ventricle, Aorta, Left auricle

Ans. Pulmonary Vein → Left auricle → Left Ventricle → Aorta

(d) Sperm, Urethra, Sperm duct, Epididymis

Ans. Sperm → Epididymis → Sperm duct → Urethra

(e) Aqueous humour, Optic nerve, Retina, Lens

Ans. Aqueous humour → Lens → Retina → Optic nerve

(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) Natality	1. DDT
(b) Soil pollutant	2. Death rate
(c) Starch test	3. Carbon monoxide
(d) Mortality	4. Iodine solution
(e) Air pollutant	5. Lime water
	6. Birth rate
	7. Growth rate

Ans. (a)—6, (b)—1, (c)—4, (d)—2, (e)—3

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

(a) Thyroid gland, Lacrimal gland, Pituitary gland, Adrenal gland.

Ans. *Odd one* : Lacrimal gland ; *Category* : Endocrine glands

(b) Detergents, Sewage, X-rays, Oil spills

Ans. *Odd one* : X-rays ; *Category* : Water pollutants

(c) Spinal cord, Cerebrum, Pons, Cerebellum

Ans. *Odd one* : Spinal cord ; *Category* : Parts of brain

(d) Chloroplast, Cell wall, Large vacuoles, Centrosome.

Ans. *Odd one* : Centrosome ; *Category* : Parts of plant cell

(e) Auxin, Oxytocin, Gibberellin, Cytokinin

Ans. *Odd one* : Oxytocin ; *Category* : Phytohormones

(v) State the exact location of the following structures : [5]

(a) Thylakoids

Ans. **Thylakoids** : These are located inside the chloroplast of the plant cells, especially in leaves.

(b) Corpus callosum

Ans. **Corpus callosum** : This fibrous sheet is located between two cerebral hemispheres of the brain.

(c) Chordae tendinae

Ans. **Chordae tendinae** : These are located near the right atrio-ventricular valve, arising from the muscular projections of the right ventricular wall.

(d) Prostate gland

Ans. Prostate gland : It is located around the urethra, close to its origin from the urinary bladder of human males.

(e) Adrenal glands

Ans. Adrenal glands : These are located on the top of each kidney like caps.

SECTION B

(Attempt **any four** questions from this Section.)

QUESTION 3

(i) Define Guttation.

[1]

Ans. Guttation : It is a kind of exudation during which the leaves of certain plants ooze out droplets of water along their margins. These droplets of water are released through the special pore-bearing structures, known as hydathodes. It happens in some plants like banana, *Nasturtium*, strawberry, etc.

(ii) Give one difference between Lenticels and Stomata.

[2]

Ans.

Lenticels	Stomata
Lenticels are located on the surface of older, woody stems/barks of the trees.	Stomata are mostly located on the lower surface of the leaves.

(iii) What is Parthenocarpy ? Give one example.

[2]

Ans. The process of development of fruits without fertilization is called parthenocarpy. Example of parthenocarpic fruits are — Papaya, Grapes, Banana, Apple, etc.

(iv) State Mendel's Law of Segregation.

[2]

Ans. Mendel's Law of Segregation : This law states that — the two members of a pair of factors separate during the formation of gametes. They do not blend but segregate or separate into different gametes.

(v) Study the diagram given below and answer the questions that follow :

[3]

(a) Name the process being studied in the above experiment.

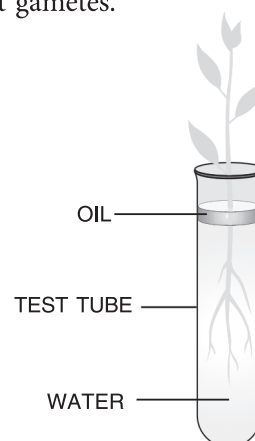
Ans. Transpiration.

(b) What will you observe with regard to the level of water when this setup is placed in bright sunlight ?

Ans. The level of water will decrease in the test tube.

(c) Mention one adaptation found in plants to overcome the process mentioned in (a).

Ans. Sunken stomata / thick cuticle.



QUESTION 4

(i) Expand the abbreviation — ATP.

[1]

Ans. ATP — Adenosine Triphosphate.

(ii) Name any two nitrogenous bases.

[2]

Ans. Adenine, Guanine.

(iii) Addition of salt to pickles prevents the growth of bacteria. Explain by giving two suitable reasons.

[2]

Ans. (a) Addition of salt to pickles makes the solution hypertonic as compared to the cytoplasm of the bacterial cell.



(b) The bacterial cell will undergo exosmosis and hence bacteria will be plasmolysed and destroyed. In this way, pickles are preserved by the addition of salt.

(iv) Mention two adaptations in leaves to perform Photosynthesis. [2]

Ans. (a) Large surface area for maximum light absorption.

(b) Transparent and waterproof cuticle and upper epidermis to allow light to enter freely.

(v) Given below is a diagram representing a stage during the mitotic cell division. Answer the following questions : [3]

(a) Identify the stage.

Ans. Prophase.

(b) Give a suitable reason for your answer in (a).

Ans. (i) Nucleolus and Nuclear membrane start disappearing.

(ii) The chromosomes have duplicated to form paired chromatids.

(iii) The centrioles have duplicated and they start moving apart.

(c) Name the stage that follows the one shown in the diagram.

Ans. Metaphase.



QUESTION 5

(i) Define — Excretion. [1]

Ans. The process of removal of harmful and unwanted nitrogenous waste products from the body of a living organism is termed as excretion.

(ii) What is the significance of Hepatic Portal vein ? [2]

Ans. Significance of hepatic portal vein :

(a) It supplies nutrient-rich blood from the gastrointestinal tract to the liver first instead of the heart.

(b) It ensures that the possible toxins that may have been ingested are processed and detoxified first before they are released into the systemic circulation.

(iii) State two functions of vitreous humour. [2]

Ans. Functions of vitreous humour :

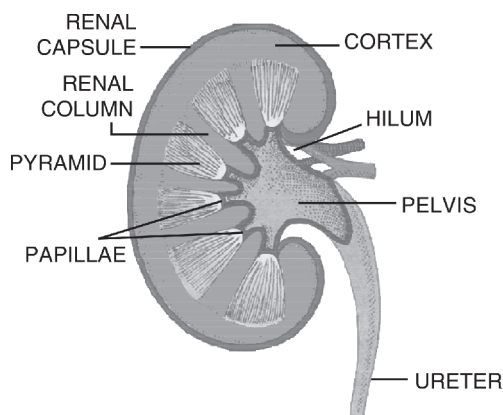
(a) It helps in maintaining the shape of the eye balls.

(b) It protects the retina and its nerve endings.

(iv) Which gland secretes Glucagon? What is its effect on blood sugar level? [2]

Ans. Pancreas secretes glucagon. It stimulates the breakdown of glycogen in the liver to glucose (glycogenolysis). Thus it raises the sugar level in the blood.

(v) Draw a neat labelled diagram to show the internal structure of a human kidney. [3]



QUESTION 6

(i) Define — Gene. [1]

Ans. **Genes** are the basic unit of heredity. They are specific sequences of nucleotides on a chromosome which determine a particular feature of the body.

(ii) Differentiate between Cell wall and Cell membrane with reference to permeability. [2]

Ans.	Cell wall	Cell membrane
	Cell wall is freely permeable, allowing all substances to enter or leave the cell without any hindrance.	Cell membrane is semi-permeable, allowing only certain substances to pass through it and preventing others.

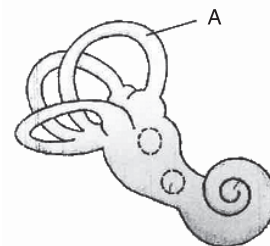
(iii) State the function of Medulla Oblongata with a suitable example. [2]

Ans. **Medulla oblongata** controls the activities of internal organs like peristaltic movements of the alimentary canal.

(iv) Colour blindness is generally seen in males. Explain. [2]

Ans. Colour blindness is an X-linked disease and it is generally seen in males because males have only one X-chromosome and if they have a defective gene on it, they will become colour blind. In case of females, if one X-chromosome has a defective gene, the other X-chromosome will retain the normal vision. Therefore, women can be carriers but not colour blind.

(v) Study the diagram given below and answer the questions that follow : [3]



(a) Identify the structure.

Ans. Membranous labyrinth / inner ear.

(b) In which part of the ear is it located ?

Ans. Internal ear.

(c) What is the function of the part marked A ?

Ans. Part marked A is semi-circular canal. These are concerned with dynamic equilibrium of the body.

QUESTION 7

(i) Explain — Accommodation of eye. [1]

Ans. The process of focusing the eye to see objects at different distances is called the accommodation of eye.

(ii) Give two reasons for a sharp rise in world human population. [2]

Ans. (a) Better health care for all age groups and advanced vaccination programmes, thereby reducing the death rate.

(b) Improved nutrition.

(iii) Mention two functions of Amniotic fluid. [2]

Ans. Functions of amniotic fluid :

(a) Protects the embryo from physical damage by jerks or mechanical shocks; for example, when the mother falls over.

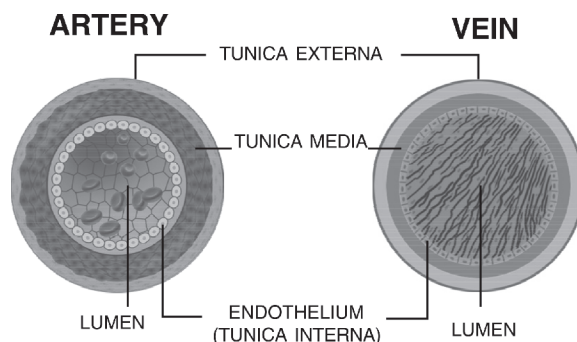
(b) Keeps an even pressure all around the embryo.

(iv) What is the difference between Phenotype and Genotype? [2]

Ans.	Phenotype	Genotype
	The observable characteristic features of the living organisms which are genetically controlled are termed as phenotype.	The set of genes present in the cells of an organism is termed as genotype.

(v) Draw neat labelled diagrams showing the cross sections of an Artery and a Vein. [3]

Ans.



QUESTION 8

(i) Define — Pollution. [1]

Ans. The addition of any such contaminant or pollutant to air, water or land which deteriorates the natural quality of the environment is termed as pollution.

(ii) Plants droop on a hot day even though the soil is well watered. Explain. [2]

Ans. Plants droop on a hot day even though the soil is well watered because the rate of transpiration exceeds the rate of absorption of water due to high temperatures and so the plants become less turgid.

(iii) Differentiate between Menarche and Menopause. [2]

Ans.

Menarche	Menopause
Menarche is the onset of menstruation in a young female at about the age of 13 years.	Menopause is the permanent stoppage of menstruation in females at about the age of 45 years.

(iv) State two harmful effects of acid rain. [2]

Ans. **Harmful effects of acid rain :**

- Damage to vegetation by pollution of the soil.
- Decay of building material and paints leading to the damage of ancient monuments.

(v) The diagram given below shows a type of tropism. Answer the questions that follow : [3]

(a) Name the type of tropism.

Ans. Chemotropism.

(b) Define the above mentioned tropism.

Ans. **Chemotropism** is a kind of tropic movement in plants, in which parts of the plant/plant organs grow in response to chemicals.

(c) Give an example of a stimulant that helps in the growth of the part marked – A.

Ans. The chemical stimulant can be sugars/peptones, which help in the growth of the part marked A, i.e. pollen grains.

