

ICSE 2023, EXAMINATION

Sample Question Paper-1

(Specimen paper issued by CISCE dated 12th July 2022 for 2023 Exam)

BIOLOGY (SCIENCE PAPER-3)

Class-10th

SOLVED

Time Allowed: 2 hours

Maximum Marks: 80

Answers of this paper must be written on the paper provided separately.

You will not be allowed to write during the 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

(Attempt all questions from this section)

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 |
- (ii) On which day of the menstrual cycle does ovulation take place?
- | | |
|--------------------------|--------------------------|
| (a) 1 st day | (b) 5 th day |
| (c) 14 th day | (d) 28 th day |
- (iii) Ganong's Potometer is used to study:
- | | |
|--------------------|-----------------------------|
| (a) Photosynthesis | (b) Rate of uptake of water |
| (c) Exosmosis | (d) Guttation |
- (iv) The number of chromosomes in a human skin cell are:
- | | |
|--------|--------|
| (a) 22 | (b) 23 |
| (c) 44 | (d) 46 |
- (v) Cretinism and Myxedema are due to:
- | | |
|---------------------------------|--------------------------------------|
| (a) Hypersecretion of thyroxine | (b) Hypersecretion of growth hormone |
| (c) Hyposecretion of thyroxine | (d) Hypersecretion of growth hormone |
- (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 |
- (vii) An example of a biodegradable substance is:
- | | |
|---------------|-----------|
| (a) Aluminium | (b) Paper |
| (c) Plastic | (d) Steel |

- (viii) The part that is cut in Vasectomy is:
- (a) Urethra (b) Oviduct
(c) Fallopian tube (d) Vas deferens
- (ix) Gestation period of human foetus is:
- (a) 40 days (b) 280 days
(c) 280 weeks (d) 40 months
- (x) The part of the human eye where the rods and cones are located is:
- (a) Iris (b) Retina
(c) Sclera (d) Choroid
- (xi) Organ of Corti is present in:
- (a) Utriculus (b) Sacculus
(c) Cochlea (d) Incus
- (xii) The outermost covering of the brain is:
- (a) Arachnoid (b) Pia mater
(c) Pericardium (d) Dura mater
- (xiii) Cytokinins are predominantly present in:
- (a) Meristematic tissues (b) Permanent tissues
(c) Endodermis (d) Epidermis
- (xiv) Marine fish when placed in tap water bursts because of:
- (a) Diffusion (b) Plasmolysis
(c) Endosmosis (d) Exosmosis
- (xv) Urine is carried from kidney to urinary bladder by:
- (a) Uterus (b) Urethra
(c) Umbilical cord (d) Ureter

2. (i) Name the following:

- (a) The suppressed allele of a gene.
(b) The knot like mass of blood capillaries in Bowman's capsule.
(c) The mineral element required for the synthesis of thyroxine.
(d) One gaseous compound that depletes the ozone layer.
(e) The statistical study of human population. [5]

(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.

- (a) Soil water, Xylem, Root hair, Cortex
(b) Tympanum, Incus, Malleus, Stapes
(c) Pulmonary Vein, Left Ventricle, Aorta, Left auricle
(d) Sperm, Urethra, Sperm duct, Epididymis
(e) Aqueous humour, Optic nerve, Retina, Lens [5]

(iii) Match the items given in Column I with the most appropriate ones in Column II and rewrite the correct matching pairs. [5]

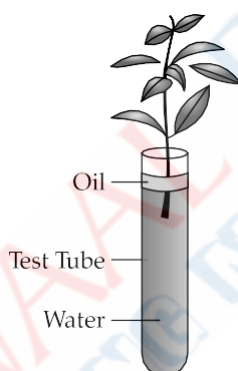
	Column I		Column II
(a)	Natality	1.	DDT
(b)	Soil pollutant	2.	Death rate
(c)	Starch test	3.	Carbon monoxide
(d)	Mortality	4.	Iodine solution
(e)	Air pollutant	5.	Lime water
		6.	Birth rate
		7.	Growth rate

- (iv) Choose the odd one out from the following terms and name the category to which the others belong: [5]
- Thyroid gland, Lacrimal gland, Pituitary gland, Adrenal gland.
 - Detergents, Sewage, X-rays, Oil spills
 - Spinal cord, Cerebrum, Pons, Cerebellum
 - Chloroplast, Cell wall, Large Vacuoles, Centrosome.
 - Auxin, Oxytocin, Gibberellin, Cytokinin
- (v) State the exact location of the following structures: [5]
- Thylakoids
 - Corpus callosum
 - Chordae tendinae
 - Prostate gland
 - Adrenal glands

SECTION-B

(Attempt any four questions from this Section)

3. (i) Define Guttation. [1]
 (ii) Give one difference between Lenticels and Stomata. [2]
 (iii) What is Parthenocarpy? Give one example. [2]
 (iv) State Mendel's Law of Segregation. [2]
 (v) Study the diagram given below and answer the questions that follow: [3]



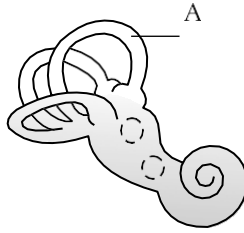
- Name process being studied in the above experiment.
 - What will you observe with regard to the level of water when this setup is placed in bright sunlight.
 - Mention one adaptation found in plants to overcome the process mentioned in (i).
4. (i) Expand the abbreviation- ATP. [1]
 (ii) Name any two nitrogenous bases. [2]
 (iii) Addition of salt to pickles prevents the growth of bacteria. Explain by giving two suitable reasons. [2]
 (iv) Mention two adaptations in leaves to perform Photosynthesis. [2]
 (v) Given below is a diagram representing a stage during the mitotic cell division. [3]



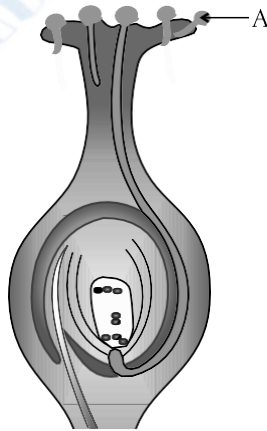
Answer the following questions:

- Identify the stage.
- Give a suitable reason for your answer in (a).
- Name the stage that follows the one shown in the diagram.

5. (i) Define- Excretion. [1]
 (ii) What is the significance of Hepatic Portal Vein? [2]
 (iii) State two functions of vitreous humour. [2]
 (iv) Which gland secretes Glucagon? What is its effect on blood sugar level? [2]
 (v) Draw a neat labelled diagram to show the internal structure of a human kidney. [3]
6. (i) Define- Gene. [1]
 (ii) Differentiate between Cell wall and Cell membrane with reference to permeability. [2]
 (iii) State the function of Medulla Oblongata with a suitable example. [2]
 (iv) Colour blindness is generally seen in males. Explain. [2]
 (v) Study the diagram given below and answer the questions that follow:



- (a) Identify the structure.
 (b) In which part of the ear is it located?
 (c) What is the function of the part marked A?
7. (i) Explain - Accommodation of eye. [1]
 (ii) Give two reasons for a sharp rise in world human population. [2]
 (iii) Mention two functions of Amniotic fluid. [2]
 (iv) What is the difference between Phenotype and Genotype? [2]
 (v) Draw neat labelled diagrams showing the cross sections of an Artery and a Vein. [3]
8. (i) Define - Pollution. [1]
 (ii) Plants droop on a hot day even though the soil is well watered. Explain. [2]
 (iii) Differentiate between Menarche and Menopause. [2]
 (iv) State two harmful effects of acid rain. [2]
 (v) The diagram given below shows a type of tropism. Answer the questions that follow: [3]



- (a) Name the type of tropism.
 (b) Define the above mentioned tropism.
 (c) Give an example of a stimulant that helps in the growth of the part marked- A.

SOLUTIONS

Sample Question Paper-1

BIOLOGY (SCIENCE PAPER-3)

SECTION-A

1. (i) Option (a) is correct

Explanation: Capillary: It is made of single layer of squamous epithelium, hence it does not contain any muscular wall

- (ii) Option (c) is correct

Explanation: 14th Day: In an average 28-day menstrual cycle, ovulation typically occurs about 14 days before the start of the next menstrual period.

- (iii) Option (b) is correct

Explanation: Rate of uptake of water: Ganong's Potometer is used to measure the transpiration rate (water uptake by the plant shoot) in a laboratory.

- (iv) Option (d) is correct

Explanation: 46: All the cells are made of pair of 23 chromosomes. It means, humans have 46 chromosomes in total.

- (v) Option (c) is correct

Explanation: Hyposecretion of thyroxine: The cause for cretinism and myxedema is due to the hyposecretion of the thyroid hormones. The deficient secretion of thyroxine is due to underactivity of the thyroid gland.

- (vi) Option (a) is correct

Explanation: Grana of chloroplast: The reactions of light-dependent phase of photosynthesis takes place with the thylakoids. The green-coloured pigment, chlorophyll, captures the energy from the sun of the breakdown of water molecules.

- (vii) Option (b) is correct

Explanation: Paper: Biodegradable material can be decomposed by the activity of micro-organisms which includes animal and human waste, plant products such as wood, paper, etc.

- (viii) Option (d) is correct

Explanation: Vas deferens: The vas deferens is cut and a small piece may be removed, leaving a short gap between the two ends.

- (ix) Option (b) is correct

Explanation: 280 days: The average length of human gestation is 280 days, or 40 weeks, from the first day of the woman's last menstrual period.

- (x) Option (b) is correct

- (xi) Option (c) is correct

Explanation: Cochlea: The Organ of Corti contributes to the audition and it is an organ of the inner ear located within the cochlea.

- (xii) Option (d) is correct

Explanation: Dura mater: The tough outer layer is called dura mater. This tissue separates the cranial cavity into compartments and protects the brain from displacement.

- (xiii) Option (a) is correct

Explanation: Meristematic tissue: Cytokinin is predominantly present in Meristematic tissue.

- (xiv) Option (c) is correct

Explanation: Endosmosis: Marine fish when thrown under tap water bursts because of Endosmosis.

- (xv) Option (d) is correct

Explanation: Ureter: When urine is formed, tubes called ureters transport it to the urinary bladder, where it is stored and excreted via the urethra.

2. (i) (a) Recessive allele

(b) Glomerulus

(c) Iodine

(d) Chlorine atoms

(e) Demography

- (ii) (a) Soil water → Root hair → Cortex → Xylem

(b) Tympanum → Malleus → Incus → Stapes (from outside to inside)

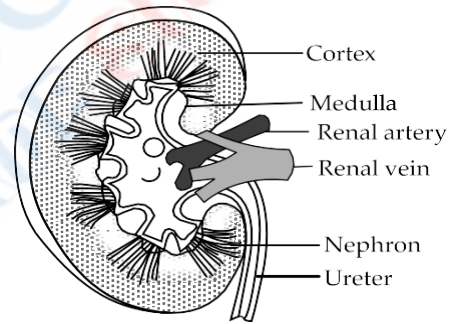
(c) Pulmonary Vein → Left auricle → Left ventricle → Aorta

(d) Sperm → Epididymis → Sperm duct → Urethra

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

- (iii) a—6, b—1, c—4, d—2, e—3

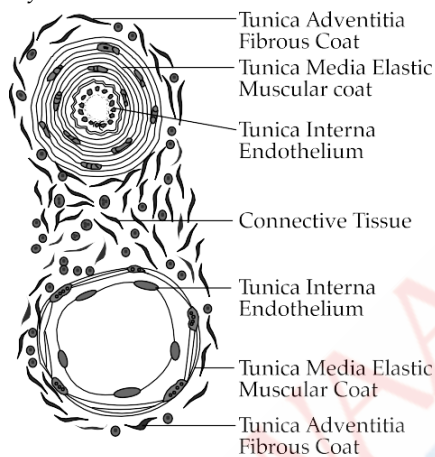
- (iv) (a) Odd term: Lacrimal gland
Category: The other three glands belong to Endocrine system.
- (b) Odd term: X-Rays
Category: The other three are water pollutants.
- (c) Odd term: Pons
Category: The other three are the major parts of the brain.
- (d) Odd term: Centrosome
Category: The other three belongs to plant cell.
- (e) Odd term: Oxytocin
Category: The other three belongs to plant growth hormones category.
- (v) (a) Grana in the stroma (matrix) of chloroplast
(b) Underneath the cerebrum at the midline of the brain
(c) Between the papillary muscles and the edges of the tricuspid and mitral valve
(d) Just below the bladder and in front of the rectum
(e) On top of both kidneys
- 3.** (i) Guttation is the loss of water in the form of water droplets from hydathodes (small pores) on the leaf margin of a small herbaceous plant.
- (ii) Stomata mainly occur in the lower epidermis of leaves, whereas lenticels occur in the periderm of the woody trunk or stems.
- (iii) Parthenocarpy is the development of fruit without fertilisation. For e.g., Grapes, orange
- (iv) During the formation of gamete, all the genes separate from each other so that each gamete carries only one allele for each gene.
- (v) (a) The process being studied in the above experiment is transpiration of water.
- (b) When the experimental setup is placed in bright sunlight, we can observe that the rate of transpiration highly increases thus the level of the water level in the test tube is seen to decrease fast from its initial marking.
- (c) One adaptation is plants in loss of leaves, i.e., leaves are completely absent or changed into spines, such as cacti to overcome the water loss during Guttation.
- 4.** (i) Adenosine triphosphate (ATP)
(ii) adenine, thymine
(iii) Salt acts as a preservative agent and it prevents the microbial contamination.
- The concentration of the pickle increases upon the addition of salt.
 - Exosmosis occurs when the bacteria come into contact with the pickle, the cell becomes flaccid, causing the death of the bacteria.
- (iv) Large surface area for maximum light absorption and thin structure-short distance for carbon dioxide to diffuse into leaf cells.
- (v) (a) Late prophase
(b) As the nuclear membrane is disappearing.
(c) Metaphase
- 5.** (i) The separation and throwing off the waste materials or toxic substances from the cells and tissues of a plant or animal is called excretion.
- (ii) The hepatic portal vein carries 75% of the hepatic blood flow and it supplies veins with metabolic substrates.
- (iii) It helps to maintain the round shape of the eye and can also help with vision clarity and shock absorbance.
- (iv) Glucagon is a hormone that your pancreas makes to help regulate your blood glucose (sugar) levels. Glucagon increases your blood sugar level and prevents it from dropping too low.
- (v)



- 6.** (i) A gene is the basic physical and functional unit of heredity.
- (ii) **Cell wall:** The cell wall is fully permeable to smaller molecules sized upto 30-60 KDa.
Cell membrane: The cell membrane is selectively permeable. It controls the movement of the substance into and outside of the cell.
- (iii) Medulla oblongata is a key conduit for nerve signals to and fro from your body as it connects your brain and spinal cord. It also helps control vital processes like your heartbeat, breathing blood vessel dilation, and blood pressure.
- (iv) The genes responsible for the color blindness are located on the X chromosome and males have only one X chromosome, from their mother.
- (v) (a) Semicircular Canals
(b) They are located in the inner part of the ear.
(c) The semicircular (anterior) canal sense head rotations, arising either from self-induced movements or from angular accelerations of the head imparted by external forces.
- 7.** (i) Accommodation is the process by which certain muscles function, to adjust the focal length of

the image from a distance and tune it to see the nearer objects automatically.

- (ii) Better health care is available for all age groups and Food shortage has been overcome due to the Green Revolution.
- (iii) Amniotic fluid allows for freedom of fetal movement and permits musculoskeletal development, and it also protects the foetus from injury and temperature changes.
- (iv) The genotype is a set of genes in DNA responsible for unique trait or characteristics (like TT or Tt is the genotype for trait height) whereas the phenotype is the physical appearance or characteristic of an organism (like tall or dwarf are the phenotypes of trait height).
- (v) Artery



- 8. (i) Pollution is the introduction of harmful materials into the environment through different means like air, water, soil, etc.
- (ii) As on a hot day, the rate of transpiration exceeds the rate of water absorption by the roots.
- (iii) The first menstruation of the human female on the attainment of puberty that occurs at about 13 years of age is called menarche, whereas the phase in the human female's life when ovulation and menstruation stop that occurs at about 45-55 years of age is called menopause.
- (iv) Acid rain leaches aluminum from the soil which is harmful for plants and animals. It also removes minerals and nutrients from the soil that trees need to grow.
- (v) (a) The type of tropism is Chemotropism.
 (b) It is the phenomenon of growth of plant organs in response to chemicals.
 (c) Sugars and Peptones