ICSE SEMESTER 2 EXAMINATION

SAMPLE PAPER - 3

BIOLOGY

(SCIENCE PAPER 3)

Maximum Marks: 40

Time allowed: One and a half hours

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during the first 10 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.

---

*Attempt **all** questions from **Section A** and **any three** questions from **Section B**.*

SECTION A

*(Attempt **all** questions.)*

Section-A (Attempt all questions)

Question 1.

Name the following by choosing the correct answers to the questions from the given options. (Do not copy the question, Write the correct answer only.)

(i) Heart is covered by a membranous covering called:

(a) Myocardium
(b) Chordae tendinae
(c) Pericardium
(d) Papillary muscles

(ii) _____ are the breakdown products of the haemoglobin of the dead RBCs.

(a) Uric acid (b) Urea (c) Ammonia (d) Bile pigments

(iii) Give reason for the following:

The urine is slightly thicker in summer than winter.

(a) Due to consumption of more water
(b) Water is lost through sweat during summer
(c) During summer more water is reabsorbed
(d) Both (b) and (c)

(iv) Longest cell in human body:

(a) Stem cell (b) Muscle cell (c) Liver cell (d) Nerve cells

(v) Electric Impulse travels through part of neuron from start to end.

(a) Dendrite → Cell body → Axon
(b) Axon → Cell body → Dendrite
(c) Dendrite → Nucleus → Axon
(d) Dendrite → Nucleus → Nerve ending

(vi) Peripheral nervous system consists of_____.

(a) Cranial nerve
(b) System nerve
(c) Spinal nerve
(d) Both (a) and (c)

(vii) Which neurotransmitters are used to communicate with in the autonomic nervous system?

(a) Adrenaline (c) Noradrenaline

(b) Acetylcholine (d) Both (b) and (c)

(viii) White matter mainly composed of:

(a) Myelinated Dendrites (c) Myelinated Axon

(b) Myelinated Nerve cell bodies (d) Unmyelinated Axon

(ix) Aqueous humour is present between the :

(a) lens and retina (c) cornea and iris

(b) iris and lens (d) cornea and lens

(x) Which hormone aids in regulation of thyroid secretion?

(a) STH (b) ACTH (c) ADH (d) TSH

Section-B (Attempt any three questions from this section)

Question 2.

(i) Give any 2 general properties of hormones.

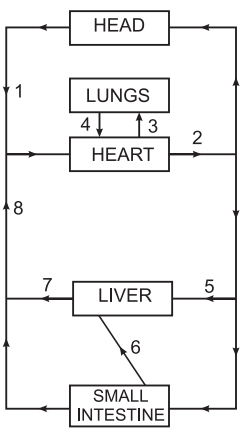
(ii) Write about origin and functions of Red Blood Corpuscles.

(iii) The diagram alongside represents the simplified pathway of the circulation of blood. Study the same and answer the questions that follow:

(a) Name the blood vessels labelled 1 and 2.

(b) State the function of blood vessels labelled 5 and 8.

(c) What is the importance of the blood vessel labelled 6?



(iv) Explain the terms : (a) Sensory nerve, (b) motor nerve, and (c) mixed nerve.

Question 3.

(i) Difference between Diastole and Systole.

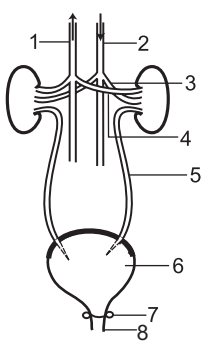
(ii) State the location and function of Tissue Fluid.

(iii) The diagram shows the Excretory System of a human being. Study the same and then answer the questions that follow:

(a) Name the parts labelled 1, 2, 3, and 4.

(b) Give the main function of the parts labelled 5, 6, 7 and 8.

(c) Name the endocrine gland which could be added in the diagram and state its location/position.



(iv) Write constituents of urine.

Question 4.

(i) Veins have valves at intervals in their inner lining whereas the arteries do not have valves give suitable reason for supporting the statement.

(ii) Give the location of pancreas.

(iii) Name the hormones released by pancreas, and write the function of any one of them.

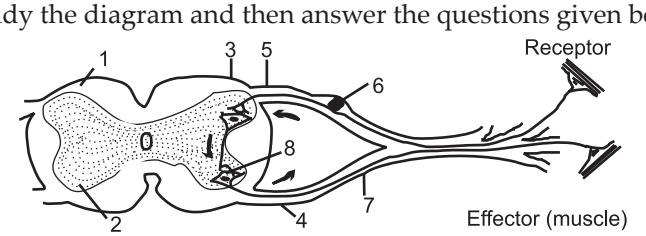
(iv) Name the blood vessels entering the heart and leaving the heart.

Question 5.

(i) How does an impulse travel across a synapse ?

(ii) What is meant by power of accommodation of the eye ? Name the muscles of the eye responsible for the same.

(iii) The diagram given below represents the spinal cord of a mammal, seen in a transverse section together with the nerves. Study the diagram and then answer the questions given below:



(a) Label the parts 1–8 indicated by guidelines.

(b) What do the arrows indicate? What is the pathway indicated termed?

(c) What type of nerve is shown in the diagram?

(iv) Classify the following as endocrine or exocrine gland. (a) Salivary gland (b) Liver (c) Thyroid gland (d) Pancreas (e) Adrenal.

Question 6.

(i) What are the functions of tears ?

(ii) Give the full forms of the following abbreviations and their other names:

(a) ADH (b) GH

(iii) Name the following: .

(a) A colourless fluid found in brain and spinal cord.

(b) The fluid which conveys the vibrations of sound in the cochlea and semicircular canal.

(c) The most sensitive region of the retina.

(iv) Name the hormone produced by the following glands and also give one function for each. (a) Thyroid (b) Pancreas (c) Adrenal medulla.

Answers

Section-A

Answer 1.

(i) (c) Pericardium

Explanation:

Heart is protected by a double walled membranous covering called pericardium. It contains pericardial fluid which reduces friction during heartbeat.

Chordae tendinae are tendinous cords arising from the ventricular walls.

The muscles of the heart are termed as myocardium.

Papillary muscles are muscular projections of the ventricle wall.

(ii) (d) Bile pigments

Explanation:

The old and Weak red blood cells destroyed in the spleen, liver and bone marrow; their iron part is retained in the liver while the rest is excreted as bile pigment (bilirubin).

(iii) (d) Both (b) and (c)

Explanation:

During summer water is lost from the body through sweat, more water is reabsorbed from proximal and distal convoluted tubule to maintain balance. Hence urine is slightly thicker in summer than in winter.

(iv) (d) Nerve cells

Explanation:

Nerve cell is the longest cell in human body. It transmit signal between different part of the body.

(v) (a) Dendrite → Cell body → Axon

Explanation:

Electrical impulse travels from the dendrite to the cell body and then along the axon to its end.

(vi) (d) Both (a) and (c)

Explanation:

Peripheral nervous system consisting of cranial nerves arising from the brain and spinal nerve arising from the spinal cord.

(vii) (d) Both (b) and (c)

Explanation:

The two neurotransmitters (Chemical Messengers) are used to communicate with in the autonomic nervous system are Acetylcholine and Noradrenaline (Norepinephrine).

(viii) (c) Myelinated Axon

Explanation:

White matter is the tissue present at the centre of the brain, it is light in colour because of lipid(fatty substance) present in the myelin. It majorly composed of myelinated Axon. It is important because it allows messages to pass quickly between different areas of gray matter. White matter continue to develop and peak in middle age.

(ix) (d) cornea and lens

Explanation:

Aqueous chamber is the front chamber between the lens of cornea. It is filled with clear watery liquid called aqueous humour.

(x) (d) TSH

Explanation:

Thyroid Stimulating Hormone (TSH) aids in the regulation of thyroid secretion.

Section-B

Answer 2.

(i) (a) Hormones are secreted by the endocrine glands.
(b) Hormones are specific in function.
(c) Hormonal effects are long lasting.
(d) Hormones are required in very minute quantities.
(e) They are secreted independent of one another.
(f) They act as chemical co-ordinators or chemical messengers.
(g) They are protein or steroid in nature.
(h) They are secreted in response to specific stimuli.

(ii) **Origin:** In the early childhood stage, RBCs are formed in the liver, spleen and thymus. In the later stages, red bone marrow starts producing RBCs.

Function : They help in the transportation of oxygen and carbon dioxide to the different parts of body.

(iii) (a) 1. Anterior vena cava.
2. Aorta
(b) Blood vessel 5 supplies oxygenated blood to the liver.
Blood vessel 8 brings deoxygenated blood from lower parts of the body to heart.
(c) It brings all the digested food and deoxygenated blood from parts of alimentary canal to liver.

(iv) (a) A sensory nerve is one which sends nerve impulses from a receptor (sense organs) to the central nervous system.
(b) A motor nerve is one which carries the impulses from the central nervous system to an effector.
(c) A mixed nerve is one which carries both sensory and motor fibres. For example, a spinal nerve.

Answer 3.

(i)

Diastole	Systole
(i) It is the condition of the heart when the chambers relax.	It is the condition of the heart when the chambers of the heart contract.
(ii) It is the condition when the blood enters the chamber, *e.g.*, when left atrium relaxes, blood enters from the pulmonary vein under low pressure.	It is the condition when the blood is pumped out of the heart, *e.g.*, when the left ventricle contracts, the blood is pumped to the body under high pressure.

(ii) When blood flows in the capillaries of tissues, plasma and leukocytes leak out through their walls. This fluid bathes the cells and is called tissue fluid or intercellular fluid or extracellular fluid. From this fluid the cells absorb oxygen and other required substances, and in turn, give out carbon dioxide and other wastes back out.

(iii) (a) 1—Inferior vena cava
2—Aorta
3—Renal artery
4—Renal vein

(b) (5) Ureter—Carry urine to the bladder.
(6) Urinary bladder—Store urine.
(7) Sphincter muscle—Control the voiding of urine
(8) Urethra—Release urine periodically.

(c) Adrenal gland—At the top of each kidney.

(iv) **Constituents of urine:** The normal human urine consists of about 95% of water and 5% of solid wastes dissolved in it. The percentage of the solid wastes may slightly vary according to the food taken and according to the time after taking food but usually these are approximately as follows :

Organic Constituents in (g/L)	Inorganic Constituents in (g/L)
Urea — 2.3	Sodium chloride — 9.0
Creatinine— 1.5	Potassium chloride— 2.5
Uric acid — 0.7	Sulphuric acid — 1.8
Others — 2.6	Ammonia — 0.6
	Others — 2.5

Besides the normal constituents, the urine may pass out certain hormones and medicines like the antibiotics and the excess vitamins.

Answer 4.

(i) In arteries, blood flows with pressure but in veins the pressure falls considerably, so the back flow of blood is possible which is prevented by the valves present in veins.

(ii) Between the stomach and the duodenum.

(iii) Pancreas release 3 hormones, namely, Insulin, glucagon and somatostatin. The function of insulin is to promote glucose utilisation by the body cells, thereby lowering the blood sugar level in blood and it stimulates the deposition of extra glucose of the blood as glycogen in liver and muscles.

(iv) **Blood vessels entering the heart:** The auricles receive blood from three large vessels:
(i) Anterior vena cava (ii) Posterior vena cava (iii) Pulmonary vein.

Blood vessels leaving the heart: Arising from the ventricle are two large blood vessels:
(i) The pulmonary artery (ii) The aorta

Answer 5.

(i) When the impulse reaches the end of one neuron, it triggers the neuron to release some chemicals in the synapse. These chemicals diffuse across the synapse and bind with receptor molecules of the next neuron. In this way, a path is created between two neurons for the continuous transmission of impulse.

(ii) The power of accommodation of the eye is the process of adjusting the focal length of the lens according to the near or distant objects so that the image can be focused on the retina clearly. The ciliary muscles attached to the lens control its curvature and alter its focal length.

(iii) (a) 1. White matter
2. Gray matter
3. Dorsal root
4. Ventral root
5. Dorsal root ganglion
6. Sensory neuron
7. Spinal nerve
8. Synapse

(b) The sensory nerve fibre bring sensory impulses from the receptor organ to the central nervous system. The motor nerve fibre relay the motor impulses from the central nervous system to the effector organ. The pathway indicated is termed as reflex arc.

(c) Sensory or Afferent nerve.

(iv) (a) **Salivary glands :** Exocrine gland. (b) **Liver :** Exocrine gland. (c) **Thyroid gland :** Endocrine gland. (d) **Pancreas :** Has acinar cells which act as exocrine glands and the Islets of Langerhans act as endocrine glands. (e) Adrenal : Endocrine gland.

Answer 6.

(i) The functions of tears are:

(a) To lubricate the surface of eye.
(b) To wash away dust particles.
(c) To kill the germs.
(d) To communicate emotions.

(ii) (a) **ADH-** Anti Diuretic Hormone, also known as Vasopressin

(b) **GH-** Growth Hormone also known as Somatotropin

(iii) (a) Cerebrospinal fluid
(b) Endolymph
(c) Fovea centralis

(iv) (a) The thyroid secretes thyroxine. It controls basal metabolic rate (BMR), growth and differentiation of the body.

(b) Pancreas secretes insulin and glucagon. These hormones control blood glucose level. Insulin decreases while glucagon increases blood glucose level.

(c) Adrenal medulla secretes adrenaline. It controls heartbeat and blood pressure and helps in providing glucose to the body in order to overcome emergency situations. It is also called the emergency hormone.

❑❑