ICSE SEMESTER 2 EXAMINATION

SAMPLE PAPER - 2

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.

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*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) Erythrocytes and leucocytes are cellular components of human blood. The structural difference between erythrocytes and leucocytes are:

(a) Both have nucleus and haemoglobin

(b) Erythrocytes have nucleus and haemoglobin, and leucocytes have only nucleus

(c) Leucocytes have only nucleus and haemoglobin is absent

(d) All of the above

(ii) Brain is covered by membrane called _____.

(a) Scalp (b) Meninges (c) Cranium (d) Archnoid

(iii) Aqueous humour is present between the :

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

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

(iv) Relay neuron also known as _____.

(a) Communication neuron (c) Inter neuron

(b) Efferent nerves (d) Motor neuron

(v) The muscle which controls urination is:

(a) Circular muscle (c) Smooth muscle

(b) Sphincter muscle (d) Both (a) and (b)

(vi) Water is reabsorbed maximum in:

(a) Proximal and distal convoluted tubule (c) Proximal convoluted tubule

(b) Collecting tubule (d) None of these

(vii) Spinal Nerve is:
- (a) Nerves which exit from spinal cord
- (b) Mixed nerve
- (c) It is part of central nervous system
- (d) Both (a) and (b)

(viii) _____ hormone is known as growth hormone.
- (a) Somatotropin
- (b) Gonadotropin
- (c) Oxytocin
- (d) Hepatocrinin

(ix) Nerve cell communicate with another cell via _____.
- (a) synapses
- (b) plasma membrane
- (c) dendrite
- (d) nerve ending

(x) Which organ help to equalize the air pressure?
- (a) Pinna
- (b) Malleus
- (c) Eardrum
- (d) Eustachian tube

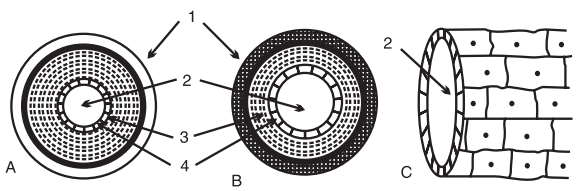
Section B (Attempt any three questions from this section)

Question 2.

(i) What is a hormone ? What is the chemical nature of hormone ?

(ii) State the location and function of sino- auricular node.

(iii) The figures given below are cross-sections of blood vessels.
- (a) Identify the blood vessels A, B and C.
- (b) Name the parts labelled 1–4.
- (c) Mention two structural difference between A and B.
- (d) Name the type of blood that flows :
  (1) Through A (2) Through B.



(iv) Give biological terms for the following:
- (a) The point of contact between the two nerve cells.
- (b) Hormones which regulate the secretion of other endocrine glands.

Question 3.

(i) Blood plasma and Serum.

(ii) State the location and function of Bundle of His.

(iii) Sketch and label the ultrastructure of nephron.

(iv) Describe in short about different body parts that perform excretion in mammals.

Question 4.

(i) Explain the term Diapedesis.

(ii) Give the location of Thyroid gland.

(iii) Name the hormones secreted by the thyroid gland and their functions.

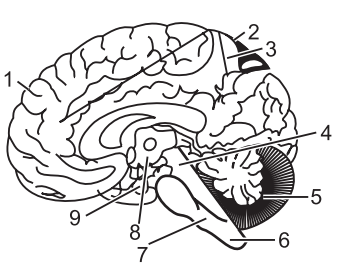
(iv) Give reason why it is necessary to know the blood groups before giving transfusion of blood.

Question 5.

(i) Give the functions of spinal cord.

(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 longitudinal section of human brain. Label its parts 1-9 as shown with guidelines.



(iv) Give reason why: 'Adrenaline is also known as emergency hormone'. Give reason in support of the statement.

Question 6.

(i) Give the location of:

(a) Corpus callosum (b) Lacrimal gland

(ii) Give full forms of the following:

(a) TSH (b) LH

(iii) Name the part of the ear associated with (a) static balance, (b) hearing and (c) dynamic balance.

(iv) Complete the table given below by filling in the blanks numbered (i) to (viii).

Gland	Hormone Secreted	Effect on Body
(i)	(ii)	Regulates basal metabolism
Pancreas (β-cells)	(iii)	(iv)
(v)	(vi)	Increases heart beat
(vii)	Thyroid stimulating hormone	(viii)

Answers

Section-A

Answer 1.

(i) (c) Leucocytes have only nucleus and haemoglobin is absent

Explanation:

Erythrocytes transport respiratory gases and consists of respiratory pigment, haemoglobin. They do not divide and hence lack nucleus.

Leucocyte's function is body defence hence they are devoid of respiratory pigment. Nucleus is present for cell division.

(ii) (b) Meninges

Explanation:

Brain is protected by 3 layers of membranous coverings called meninges (meninx) which continue backwards on the spinal cord.

(i) **Dura matter:** The outermost tough fibrous membrane.

(ii) **Arachnoid:** Thin delicate middle layer giving a web-like cushion.

(iii) **Pia matter:** Inner most highly vascular membrane, richly supplied with blood.

(iii) (d) cornea and lens

Explanation:

Aqueous chamber is the front chamber between the lens and cornea. It is filled with clear watery fluid called aqueous humor.

(iv) (c) Inter neuron

Explanation:

Relay neuron also known as interneuron because it acts as intermediate between sensory neuron and motor neuron. It is not present in receptor or effector side.

(v) (b) Sphincter muscle

Explanation:

A sphincter guards the opening of the bladder into the urethra at the time of urination.

(vi) (c) Proximal convoluted tubule

Explanation:

Reabsorption of water takes place in proximal convoluted tubule, distal convoluted tubule, and loop of Henle. About two- thirds of water is reabsorbed in proximal convoluted tubule.

(vii) (d) Both (a) and (b)

Explanation:

Spinal Nerves are those nerves which exit from spinal cord. It is a mixed nerve consisting of both sensory nerve and motor nerve, and it autonomic signal between spinal cord and the body. In human body there are 31 pairs of spinal nerves.

(viii) (a) Somatotropin

Explanation:

Somatotropin (STH) is also known as Growth hormone(GH). It controls the general growth of the body.

(ix) (a) synapses

Explanation:

A neuron is an electrically excitable cell that communicates with another cell via specialized connections called synapses. Synapse allows delivery of such impulses from neurons to other cell, such as muscle cells or gland.

(x) (d) Eustachian tube

Explanation:

Eustachian tube is present in ear. Its function is to equalise pressure between middle ear and outer atmosphere. It connects middle ear to pharynx.

Section-B

Answer 2.

(i) A hormone is defined as a chemical substance produced by the endocrine glands situated in one part of the body and carried by the blood to some other parts of the body in order to exert its regulation and co-ordination effect on the cells of a specific organ or tissue. Chemically, hormones may be proteins, amino acids or steroids *i.e.*, they are of different chemical nature. They may be proteins like insulin, polypeptides like parathyroid hormone and epinephrine or steroids as oestrogen, testosterone etc.

(ii) Sino- auricular node or Sino- atrial node is located in the walls of the right auricle. It's function is to give rise to the impulse or command which starts the heart beat. The impulse generated is relayed to the ventricles with the help of special conducting fibres. It is also known as the "Pace maker". It is situated near the opening of the superior vena cava.

(iii) (a) (A) Artery (B) Vein (C) Capillary.

(b) 1. External Layer 3. Middle Layer

2. Lumen 4. Internal layer

(c) Two structural differences between arteries and veins are:

1. Arteries are thick-walled and veins are thin-walled.
2. There are no valves in arteries while valves are present in veins.

(d) 1. Oxygenated blood flows through A.

2. Deoxygenated blood flows through B.

(iv) (a) Synapse (b) Tropic Hormones

Answer 3.

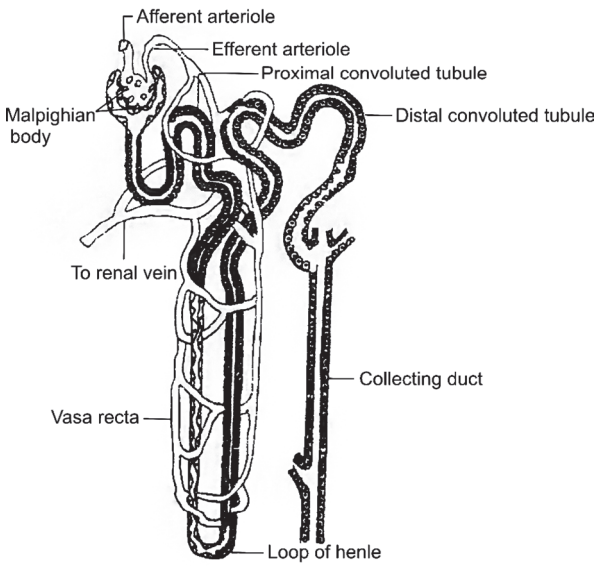
(i)

Blood Plasma	Serum
Plasma is a straw-coloured, liquid component of the blood in which blood cells are suspended.	Serum is an amber coloured, protein rich liquid, which separates when blood coagulates.

(ii) **Location:** Begins from the AVN and extends to the interventricular septum.

Function: They carry the wave of excitation from atrio-ventricular node to the ventricles.

(iii)



(iv) (a) **Kidneys:** Kidneys play a vital role in the process of excretion and are responsible for removal of nitrogenous metabolic waste from the body in the form of urine.

(b) **Sweat glands:** Primary function of sweat glands is thermoregulation (cooling). Sweat secreted by these glands consists of nitrogenous wastes in small quantities and is passed out only when cooling is required.

(c) **Lungs:** They help in the excretion of carbon dioxide during exhalation.

Answer 4.

(i) **Diapedesis:** The passage of white blood corpuscles through the unruptured walls of blood vessels is known as diapedesis. It helps in engulfing the germs and also protects the body from getting infected.

(ii) Thyroid gland is a butterfly shaped bilobed gland situated in front of the neck just below the larynx. The two lobes are joined by a narrow isthmus.

(iii) (a) **Thyroxine-** It regulates the basal metabolism, that is, the rate of cellular oxidation resulting in heat production at rest. It also influences the general growth of the body, ossification of bones, body temperature, mental development etc.

(b) **Calcitonin-** promotes movement of calcium ions from blood to bones.

(iv) In blood transfusion, it is necessary that the type of blood to be transfused should be matched with the type of blood of the receiving person. Otherwise, the RBCs of the donor blood will stick to each other and block the passage of blood vessels of the receiver, leading to death. Hence, it is necessary to know the blood groups before giving transfusion of blood.

Answer 5.

(i) It controls all the reflex actions.

It conducts sensory impulses from skin to the brain and motor impulses from brain to the muscles of trunk and limbs.

(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 controls its curvature and alters its focal length.

(iii)

1. Cerebrum	4. Mid-brain	7. Medulla oblongata
2. Gray matter	5. Cerebellum	8. Hypothalamus
3. White matter	6. Spinal cord	9. Pituitary gland.

(iv) Adrenaline is secreted at the time of emergency (stress or strain) and prepares the body for fight or flight. So, it is also known as emergency hormone. The functions of Adrenaline include:

1. It increases heart beat accompanied by an increase in blood pressure.
2. It increases blood supply to the muscles while decreasing it to skin and visceral organs.
3. More glucose is released into the blood by the liver.

Answer 6.

(i) Corpus callosum- Near the centre of brain.

Lacrimal gland- Above the lateral end of the eye.

(ii) (a) TSH- Thyroid Stimulating Hormone

(b) LH- Luteinizing Hormone

(iii) (a) Utriculus and Sacculus, (b) Cochlea, (c) Semi circular canals.

(iv)

(i) Thyroid	(v) Adrenal
(ii) Thyroxine	(vi) Adrenaline
(iii) Insulin	(viii) Pituitary
(iv) Controls blood sugar level	(ix) Stimulates the production of thyroid hormone

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