

ICSE SEMESTER 2 EXAMINATION

SAMPLE PAPER - 4

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.)*

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.)

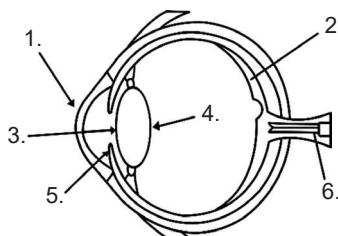
- (i) Which of the following is the characteristic of artery?
 - (a) Thin muscular wall
 - (b) A narrow lumen
 - (c) Blood flow uniformly
 - (d) Carry blood from organ to heart
- (ii) Sheet of fiber that connects two cerebral hemisphere called:
 - (a) Thalamus
 - (b) Medulla oblongata
 - (c) Corpus callosum
 - (d) Pons
- (iii) Sensory neuron is not needed in _____.
 - (a) Involuntary action
 - (b) Controlled reflex action
 - (c) Voluntary action
 - (d) Uncontrolled reflex action
- (iv) Body temperature is regulated by:
 - (a) Thalamus
 - (b) Hypothalamus
 - (c) Cerebellum
 - (d) Medulla
- (v) Information is first acquired at _____.
 - (a) Nerve Ending
 - (b) Cell body
 - (c) Dendrite
 - (d) Axon
- (vi) Which of the gland have duct?
 - (a) Mucous Gland
 - (b) Pituitary Gland
 - (c) Thyroid Gland
 - (d) Parathyroid Gland
- (vii) Diseases cause by deficiency of Thyroxin Hormone
 - (a) Goitre
 - (b) Myxoedema
 - (c) Diabetes
 - (d) (a) and (b)

- (viii) _____ Lens is used for remedy of Astigmatism.
- (a) Diverging Lens (c) Cylindrical Lens
(b) Converging Lens (d) Bifocal Lens
- (ix) Middle part of kidney tubule called:
- (a) Bowman's Capsule (c) Distal Convoluted tubule
(b) Loop of Henle (d) Proximal Convoluted tubule
- (x) Which part of kidney tubule absorbs chloride ions?
- (a) Bowman's Capsule (c) Glomerulus
(b) Loop of Henle (d) Proximal Convoluted tubule

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

Question 2.

- (i) Explain the term 'Antidiuretic hormone'. What happens due to deficiency of this hormone?
- (ii) What is the function of Capillary?
- (iii) Differentiate between Arteries and Veins.
- (iv) Given below is the diagram of a human eye. Label the parts numbered 1, 2, 3, 4, 5 and 6.



Question 3.

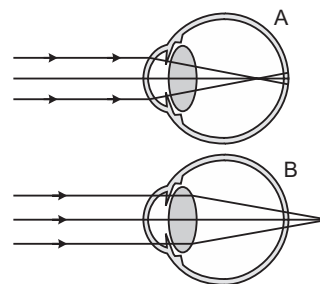
- (i) What does the term double circulation means?
- (ii) Differentiate between Renal cortex and Renal medulla.
- (iii) Explain the sequence of cardiac cycle.
- (iv) Draw the labeled diagram of reflex arc.

Question 4.

- (i) What is the synapse?
- (ii) What is difference between central nervous system and peripheral nervous system?
- (iii) Draw a diagram of a Axon and label at least three parts of the diagram.
- (iv) Explain the Ultra-filtration steps in urine formation.

Question 5.

- (i) Identify diagram A and B.
- (ii) Name three principal fluids circulate in our body.
- (iii) Differentiate between a simple and an acquired reflex.
- (iv) Which endocrine gland secretes Thyroxine hormone? Name the effects of its oversecretion and under secretion.



Question 6.

- (i) What is meant by Stereoscopic vision?
- (ii) What is full form of the following abbreviation?
- (a) ACTH (b) WBC
- (iii) What is the function of Eustachian tube and which part of the ear is called organ of hearing?
- (iv) Filling in the blanks (a) to (c):

Eardrum, cochlea, ear ossicles, pinna, Utriculus, oval window

(a) External ear:.....

(b) Middle ear:

(c) Internal ear:



Section-A

Answer 1.

- (i) (b) A narrow lumen

Explanation:

An artery is a vessel which carries blood away from the heart towards any organ. It has thick muscular wall a narrow lumen (the central bore), and the blood in it flows in spurts which correspond to the ventricular contractions of the heart.

- (ii) (c) Corpus callosum

Explanation:

Corpus callosum (hard body) is a sheet of fibres connecting the two cerebral hemisphere. It's function is to transfer information from one hemisphere to other.

- (iii) (a) Involuntary action

Explanation:

Sensory nerve is only needed when there is voluntary action is going on not when there is involuntary action. Sensory nerve is present around sensory organs.

- (iv) (b) Hypothalamus

Explanation:

Hypothalamus is part of brain (Fore brain). It controls the hormonal secretions from endocrine glands. Hormone secreted from posterior pituitary gland secrete through it. This is the centre of hunger, thirst, body temperature control, love, hate etc. Blood pressure, metabolism of water, sweat, anger, joy etc. Are controlled by it.

- (v) (c) Dendrite

Explanation:

Information acquired at the end of the dendritic tip of the nerve cell sets off a chemical reaction that creates an electrical impulse.

- (vi) (a) Mucous Gland

Explanation:

Exocrine Gland are duct glands they have excretory ducts. Exocrine gland secrete their products, hormones into the a duct. The major gland of the exocrine system include Lactic gland, Sweat gland, **Mucous gland**, Salivary gland, etc.

- (vii) (d) (a) and (b)

Explanation:

Diseases cause by deficiency of Thyroxine hormone:

1. **Goitre:** Iodine is essential for the synthesis of Thyroxine. Deficiency of Iodine in food causes Goitre. In this disease the shape of thyroid gland enlarges abnormally.
2. **Myxoedema:** It effects metabolism of youth due to which there is reduction in blood pressure and heart beat.
3. **Cretinism:** Disease effects the children and cause mental and physical retardness.
4. **Hypothyroidism:** This is due to chronic deficiency of thyroxine. Normal reproduction is not possible in this category. Due to this humans become dumb and deaf.

- (viii) (c) Cylindrical Lens

Explanation:

1. **Diverging lens:** It is used as a remedy for Myopia or shortsightedness. Can see near objects clearly while the far object can't see clearly.
2. **Converging lens:** It is used as a remedy for Hyperopia or Hypermetropia or Longsightedness. Can see the distant object clearly but not near object.
3. **Cylindrical lens:** It is used as a remedy for Astigmatism. This arises due to difference in the radius of curvature of cornea in the different planes.
4. **Bifocal lens:** It is used as a remedy for presbyopia. It is generally found in elderly person. Both distant and nearby object can not be seen clearly.

(ix) (b) Loop of Henle

Explanation:

Middle part of kidney tubule contains U-shaped structure called loop of Henle. It is shaped like a hair-pin; it is not convoluted. It runs in medulla to turn back and to re-enter the cortex to continue into the next convoluted region of the tubule.

(x) (d) Proximal Convoluted tubule

Explanation:

Glomerulus: Ultrafiltration

Bowman's capsule: Receives glomerular filtrate.

Proximal convoluted tubule: Reabsorbs most water (about two third) and much of glucose and sodium and chloride ions.

Loop of Henle: Some absorption of water and sodium ions.

Section-B

Answer 2.

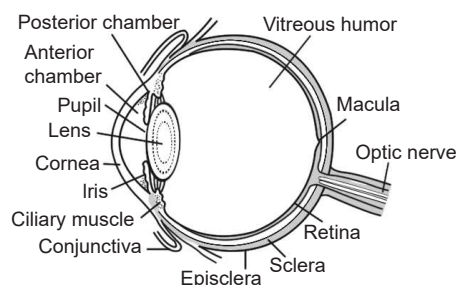
- (i) Antidiuretic hormone (ADH), also called vasopressin, constricts blood vessels with rise in blood pressure. It also acts on the kidney tubules. Deficiency of ADH causes diabetes insipidus (water diabetes) in which urination is frequent and copious, resulting in loss of water from the blood and the person becomes thirsty.
- (ii) Capillary is a very narrow tube (about 8 micrometers in diameter); its wall consists of a single layer of squamous epithelial cells (endothelium), and has no muscle.

Function of capillaries:

1. To allow outward diffusion of oxygen into intercellular fluid and from there into the tissue.
2. To allow inward diffusion of carbon dioxide from the intercellular fluid.
3. To allow inward and outward diffusion of substance.

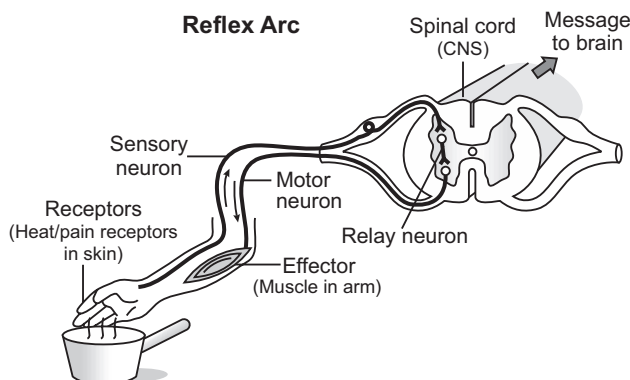
(iii)	Arteries	Veins
	Blood vessels which carry blood away from the heart and into an organ.	Blood vessels which carry blood away from an organ and towards the heart.
	Have thick and more muscular walls.	Have thin and less muscular walls.
	It carries fully oxygenated blood (except pulmonary artery).	It carries partially deoxygenated and CO ₂ laden blood (except pulmonary vein).

(iv) 1-cornea, 2-retina, 3-pupil 4- lens, 5-Iris, 6-Optic nerve



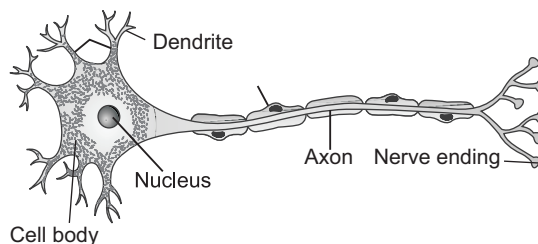
Answer 3.

- (i) Blood flows twice in the heart before it complete one full round. First, the short pulmonary circulation- circulation from lungs to heart. Second, long systematic circulation- circulation in general body. For this reason the blood circulation in body also called “double circulation”.
- (ii)
- | Renal cortex | Renal medulla |
|--|--|
| It is granular outer dark layer. | It is smooth inner light layer. |
| It consist of Glomerulus and convoluted tubules. | It consists of loop of henle and the collecting tubules. |
- (iii) Cardiac cycle is whole process of one heart-beat. It starts with contraction of atria followed by the contraction of ventricle. This contraction phase called systole. Contraction phase followed by relaxing or expansion phase. Relaxation of atria and ventricle called diastole. When both atria and ventricle relax state it complete one cycle.
- (iv)



Answer 4.

- (i) A neuron is an electrically excitable cell that communicates with another cell via specialized connection called synapse. Synapse allows delivery of such impulses from neurons to other cell, such as muscle cells or gland.
- (ii)
- | Central nervous system | Peripheral nervous system |
|---|---|
| Central Nervous System (C.N.S) is the part of Nervous system of human which keeps control on the whole body and on nervous systems. | Peripheral nervous system connects the central nervous system with other body part of the body. It carries signal arise from (C.N.S). |
| It is made up of two parts i.e., Brain and Spinal cord. | It includes nerves arise from the Spinal cord and Brain. |
- (iii)



- (iv) The blood flows through the glomerulus under great pressure which is much greater than the capillaries elsewhere. This huge pressure (hydrostatic pressure) causes the liquid part of the blood to filter out from the glomerulus into the renal tubule. This filtration under huge amount of force is called ultra-filtration.

Answer 5.

- (i) Diagram “A” shows Myopia defect because image forms before the retina and focal length fall short of retina.
Diagram “B” shows Hyperopia defect because image form after the retina and focal length fall of retina.

- (ii) Three principal fluids which circulate in our body are Blood, Tissue fluid and Lymph.

(iii)	Simple Reflex	Acquired Reflex
	Inborn (inherited) requiring no previous experience.	Developed by previous experience.
	Directly related to the stimulus.	It acquired according to the condition.
	Similar action among all individuals.	Differs in different individuals on the basis of previous experience.

- (iv) Thyroid gland secretes thyroxine hormone. Thyroxine hormone regulates vital body functions, including differentiation, breathing, heart rate, body temperature, central and peripheral nervous system etc.

Insufficient secretions of thyroxine hormone are called hypothyroidism. It leads to diseases like simple goitre, cretinism and myxoedema.

Excess secretion of thyroxine hormone is called hyperthyroidism. It leads to disease like exophthalmic goitre.

Answer 6.

- (i) Stereoscopic vision is defined as the simultaneous focussing of an object in both eyes which enables us to perceive the depth and distance of that object. The overlapping of their images in the brain gives a three dimensional effect of the image.
- (ii) **ACTH:** Adreno Cortico Tropic Hormone
WBC: White Blood Cell
- (iii) Eustachian tube is present in ear which equalises pressure between middle ear and outer atmosphere. Its connect middle ear to pharynx. The inner ear houses the cochlea (organ of hearing). The organ of Corti is located on the lower membrane (basilar membrane) of the scala media and consists of cells with hair-like projections, connecting with the terminal end of the auditory nerve.
- (iv) (d) **External ear:** Eardrum, pinna
(e) **Middle ear:** Ear ossicles, oval window
(f) **Internal ear:** Cochlea, Utriculus