ICSE SEMESTER 2 EXAMINATION

SAMPLE PAPER - 1

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) Leucocytes are white blood corpuscles. Functions of leucocytes are:

(a) Phagocytosis and inflammation
(b) Formation of antibodies
(c) Transport
(d) Both (a) and (b)

(ii) Thirst, sweat and hunger are controlled by:

(a) Hypothalamus
(b) Mid brain
(c) Cerebrum
(d) Medulla

(iii) Sclera is covered by a thin transparent membrane called_____.

(a) Retina
(b) Iris
(c) Ciliary muscle
(d) Conjunctiva

(iv) Coordination and control of reflex actions is function of:

(a) Pons
(b) Medulla
(c) Brain
(d) Spinal cord

(v) Ultrafiltration occurs in:

(a) Bowman's capsule
(b) Proximal convoluted tubule
(c) Henle's loop
(d) Distal convoluted tubule

(vi) pH of normal urine is:

(a) 4.5 to 7 (b) 3 to 8 (c) 5 to 8 (d) 7 to 8

(vii) Cranial nerves:
- (a) Consist of 12 pairs of nerves
- (b) Found at dorsal surface of the brain
- (c) It carries information from spinal nerve to other body part
- (d) It is part of central nervous system

(viii) The main function of pancreas as an endocrine gland in human body:
- (a) Help in digestive system
- (b) Regulate blood sugar levels
- (c) Regulate the iron concentration
- (d) Control other hormones

(ix) In Human brain memory power is found in:
- (a) Medulla oblongata
- (b) Cerebrum
- (c) Thalamus
- (d) Cerebellum

(x) Jelly-like fluid present in the eye called:
- (a) Pupil
- (b) Posterior chamber
- (c) Vitreous humor
- (d) Retina

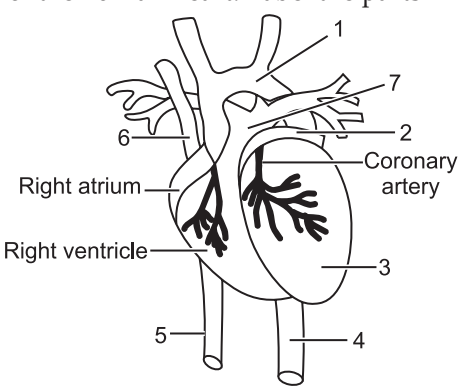
Section-B (Attempt any three questions from this section)

Question 2.

(i) Explain the term 'Endocrine Glands'. Give any two examples.

(ii) Give the location of 'Hepatic portal vein'. What is its function?

(iii) Given below is the diagram of the human heart. Label the parts 1-7.



(iv) Give biological terms for:
- (a) Short sightedness
- (b) Far sightedness

Also state how these defects can be corrected.

Question 3.

(i) Mention differences between Blood and Lymph.

(ii) Give the location of Pulmonary Vein. State its function.

(iii) Draw a labelled diagram of the human kidney as seen in a longitudinal section.

(iv) What is dialysis ? Under what conditions is it carried out ?

Question 4.

(i) Give reason why: A matured mammalian erythrocyte lacks nucleus and mitochondria.

(ii) Give the exact location of the Pituitary gland.

(iii) Mention and describe the functions of any three hormones secreted by the Anterior Pituitary.

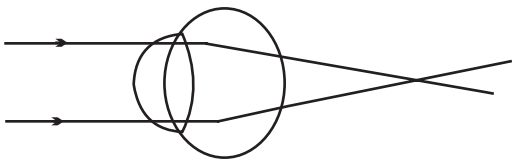
(iv) What is the contraction phase of auricles called? Name the valves which open during this phase.

Question 5.

(i) In what way is yellow spot different from blind spot ?

(ii) Deficiency of vitamin A causes night blindness. Give a suitable reason to support the statement.

(iii) Given below is a diagrammatic representation of a defect of the human eye :



(a) Identify the defect.

(b) Mention two reasons for the above defect.

(c) State how the defect can be rectified.

(iv) 'Pancreas is both an exocrine gland and an endocrine gland'. Give proper reason in support of the statement.

Question 6.

(i) Where are the following located:

(a) Iris (b) Incus

(ii) Give the full forms of the following:

(a) ACTH (b) FSH

(iii) Name the three layers of Meninges (inner most to outer most).

(iv) Complete the table by filling in the blanks (i) to (iv):

Name of the Hormone	Endocrine Gland	Function
(i)	(ii)	Deposit extra glucose or blood as glycogen
Growth Hormone	(iii)	(iv)

Answers

Section-A

Answer 1.

(i) (d) Both (a) and (b)

Explanation:

Leucocytes are white blood cells involved in body defence. Functions of leucocytes are phagocytosis, inflammation, and formation of antibodies.

(ii) (a) Hypothalamus

Explanation:

Hypothalamus is a part of the (Fore brain). It controls the hormonal secretions from endocrine glands. Hormone secreted from posterior pituitary gland are released 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.

(iii) (d) Conjunctiva

Explanation:

Near the front of the eye, in the area protected by the eyelids, the sclera is covered by a thin, transparent membrane (conjunctiva), which runs to the edge of the cornea. The conjunctiva also covers the moist back surface of the eyelids and eyeballs.

(iv) (d) Spinal cord

Explanation:

Posterior region of the medulla oblongata forms the spinal cord. Main function of spinal cord is coordination and control of reflex actions i.e it works as the centre of the reflex actions. Spinal cord carries the wave coming out of brain.

(v) (a) Bowman's capsule

Explanation:

Ultrafiltration is one of the major step for the formation of urine. Blood flows through Bowman's capsule under great pressure. This happens because efferent (outgoing) arteriole is narrower than afferent (incoming) arteriole. This high pressure causes liquid part of blood to filter out from glomerulus into renal tubule. This process is called ultrafiltration.

(vi) (c) 5 to 8

Explanation:

The pH of normal urine is 5 to 8.

(vii) (a) Consist of 12 pairs of nerves

Explanation:

Cranial nerve is the nerve which exit from the cranium of the brain. Cranial nerve are 12 pairs of nerves which are found on the ventral (bottom) surface of the brain. Cranial nerves relay information between the brain and part of the body, primarily to and from regions of the head and neck. It is part of Peripheral nervous system.

(viii) (b) Regulate blood sugar levels

Explanation:

Regulate the blood sugar level is main function of pancreas as an endocrine gland in human body.

Pancreas is both an endocrine gland as well as exocrine gland. It secretes 3 hormones, that is,

Insulin: Checks rise of sugar level in blood.

Glucagon: Stimulates breakdown of glycogen in liver to glucose, thereby raising sugar levels.

Somatostatin: Regulatory hormone which inhibits secretion of insulin and glucagon.

(ix) (b) Cerebrum

Explanation:

Cerebrum is the largest part of fore brain. It is the most developed part of the brain. Cerebrum acts as the centre of wisdom, memory, will power, movements, knowledge and thinking. It also functions as the analysis and cordination of muscular movement received from sensory organs.

(x) (c) Vitreous humor

Explanation:

The back section (posterior segment) extends from the back surface of the lens to the retina. It contains a jellylike fluid called the vitreous humour.

Section-B

Answer 2.

(i) Endocrine glands are ductless glands which pour secretions, known as 'hormones' directly into blood which are further transported to the target organs. Examples of some endocrine glands are: Thyroid glands, Adrenal glands. Pituitary gland etc.

(ii) **Location:** Between alimentary canal and liver.

Function: Hepatic portal vein drains the digestive tract and efficiently transports nutrients into the liver. Once these are processed, they are released in normal circulation by liver through hepatic vein.

(iii) 1. Aorta, 2. Left atrium, 3. Left ventricle, 4. Dorsal aorta, 5. Inferior vena cava, 6. Superior vena cava, 7. Pulmonary artery.

(iv) (a) Myopia- Can be corrected by using a biconcave lens.

(b) Hypermetropia- can be corrected using a biconvex lens.

Answer 3.

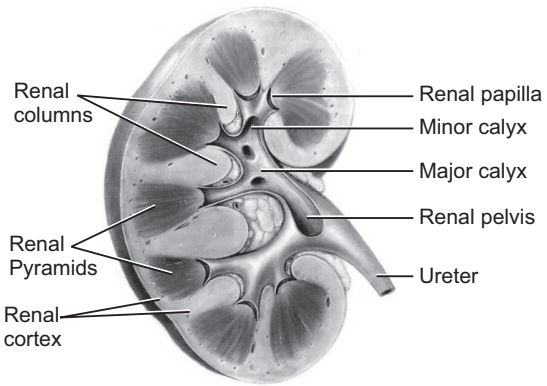
(i) Differences between Blood and Lymph.

Blood	Lymph
(i) Blood contains plasma, RBCs, WBCs and platelets.	Lymph contains only the soluble parts of plasma.
(ii) It contains albumin, globulin and fibrinogen.	It does not contain these substances.
(iii) It is an opaque, red coloured fluid of alkaline nature.	It is a colourless fluid resembling blood in other respects.

(ii) **Location:** Arises from lungs and pours blood into the left auricle.

Function: Brings oxygenated blood from lungs to the heart for circulation throughout the body.

(iii) Labelled diagram of the human kidney as seen in a longitudinal section.



(iv) The process of removing nitrogenous waste from the body by artificial means is known as dialysis. When both the kidneys fail to work, the dialysis machine is used. The patient's blood is led from the radial artery in his arm through the machine where the urea and excess salts are removed and the purified blood is returned to a vein in same arm. In case of permanent damage to the kidneys, dialysis has to be repeated for about 12 hours twice a week.

Answer 4.

(i) Loss of nucleus gives RBCs a biconcave shape thus increasing their surface area volume ratio for absorbing more oxygen. RBCs do not have mitochondria so that they cannot use oxygen for themselves. All oxygen can be efficiently transported without any consumption by RBCs and delivered to the tissues. Thus for their efficient function matured mammalian RBCs lack nucleus and mitochondria.

(ii) Pituitary gland is a small projection (about the size of a pea) which hangs from the base of the mid-brain below the hypothalamus.

(iii) Thyroid Stimulating Hormone (TSH)- activates thyroid to secrete thyroxin.

Growth Hormone (GH)- Essential for normal growth. It is also called somatotropin.

Gonad Stimulating (Gonadotropic) Hormone- regulate the activity of the gonads (testes and ovaries).

(iv) The contraction phase of auricles is called auricular systole. The openings of vena cava and pulmonary veins close and blood enters ventricles by crossing through tricuspid valve and bicuspid valve.

Answer 5.

(i) Yellow spot has more cones and less rod cells. Blind spot has no photosensitive cells. Clear images formed at the yellow spot while no images are formed at the blind spot.

(ii) Because the visual purple (Rhodopsin) of the rods, which are responsible for vision in the dark, is not formed in the absence of vitamin A.

(iii) (a) Hypermetropia (Far-sightedness) because image is behind the retina.

(b) Reasons for hypermetropia are :

(1) Shortening of eyeball from front to back.

(2) Lens becomes too flat.

(c) It can be rectified by using convex lenses of appropriate power (focal length).

(iv) Pancreas is a heterocrine or myxocrine gland, as it contains two types of secretary structures, *i.e.*, (i) Islet of Langerhans which secrete hormones insulin and glucagon, and these are transported by way of blood, and (ii) Acini that secretes pancreatic juice which is transported by way of ducts, and plays a role in digestion of food.

Answer 6.

(i) **Iris:** In the eye behind the cornea.

Incus: Incus is the middle bone of the three bones of ear ossicles which is connected to Malleus on one end and Stapes on other end and is present in the middle ear of human beings.

(ii) **ACTH-** Adreno Cortico Tropic Hormone

FSH- Follicular Stimulating Hormone

(iii) The brain is protected by 3 membranous coverings called meninges which continue backward into the spinal cord. These are:

Pia mater- inner most, highly vascular membrane, richly supplied with blood.

Arachnoid- Thin delicate middle layer giving a web like cushion.

Dura mater- the outermost tough fibrous membrane.

(iv) (i) Insulin (ii) Pancreas

(iii) Anterior Pituitary gland

(iv) It promotes the normal growth of the whole body.

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