

ICSE Solved Paper 2022 Semester-2

Biology

Class-X

(Maximum Marks : 40)

(Time allowed : One and half hours)

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

The marks intended for questions are given in brackets []

SECTION-B

(10 marks)

(Attempt all questions from this Section.)

1. Choose the correct answers to the questions from the given options. (Do not copy the question. Write the correct answer only.) [10]
- (i) The mineral element in haemoglobin :
(a) Manganese (b) Iron
(c) Sodium (d) Calcium
- (ii) The number of cranial nerves in humans are :
(a) 12 (b) 31 pairs
(c) 31 (d) 12 pairs
- (iii) Gigantism and Acromegaly are due to :
(a) Hypersecretion of Growth hormone
(b) Hypersecretion of Thyroxine
(c) Hyposecretion of Growth hormone
(d) Hyposecretion of Thyroxine
- (iv) Pericardium covers the :
(a) Heart (b) Brain
(c) Spinal cord (d) Eyeball
- (v) The circular opening in the centre of iris :
(a) Lens (b) Cornea
(c) Sclera (d) Pupil
- (vi) The blood vessel that carries oxygenated blood is :
(a) Pulmonary artery
(b) Pulmonary vein
(c) Renal vein
(d) Hepatic vein
- (vii) Organ of corti is present inside the :
(a) Cochlea
(b) Semicircular canals
(c) Sacculus
(d) Utriculus
- (viii) The structure that stores urine temporarily is :
(a) Ureter (b) Urethra
(c) Urinary bladder (d) Kidneys
- (ix) Islets of Langerhans are located in :
(a) Liver (b) Pituitary gland
(c) Spleen (d) Pancreas
- (x) The main nitrogenous waste formed in the human body :
(a) Uric acid
(b) Urea
(c) Ammonia
(d) Creatinine
- Ans. (i) Option (b) is correct.
Explanation : Iron is a mineral found in every cell of the body. Iron is considered as an essential mineral because it is needed to make haemoglobin, a part of blood cells. About 70 percent of our's body's iron is in the red blood cells called haemoglobin.
- (ii) Option (d) is correct.
Explanation : The cranial nerves are a set of 12 paired nerves in the back of your brain.
- (iii) Option (a) is correct.
Explanation : Acromegaly and Gigantism are disorder in adults in which the pituitary gland produces too much of Growth hormone.
- (iv) Option (a) is correct.
Explanation : Pericardium is a double walled membranous bag, enclosing the human heart.
- (v) Option (d) is correct.
Explanation : Pupil is a small opening in the center of the iris, through which the light enters into the eye.
- (vi) Option (b) is correct.
Explanation : The pulmonary arteries carry deoxygenated blood from the right ventricle to the lungs. The pulmonary veins carry oxygenated blood from the lungs to the left atrium.
- (vii) Option (a) is correct.
Explanation : The Organ of corti is present in the cochlea. It is a structure present on the basilar membrane. It contains hair cells that act as auditory receptors.
- (viii) Option (c) is correct.
Explanation : The ureters carry the urine away from kidneys to the urinary bladder, which acts as a store house for the urine temporarily.

(ix) Option (d) is correct.

Explanation : Islets of Langerhans are clusters of endocrine cells present throughout the pancreas.

(x) Option (b) is correct.

Explanation : Humans and most other mammals produce urea as the nitrogenous waste.

SECTION-B

(30 marks)

(Attempt any three questions from this Section.)

2. (i) Simple goitre is usually seen in people living in the hilly regions.

Give two reasons for the statement. [2]

(ii) What are the two types of blood circulation in humans? [2]

(iii) Mention the three major steps involved in the production of urine. [3]

(iv) Draw a neat diagram of a Neuron and label any two parts. [3]

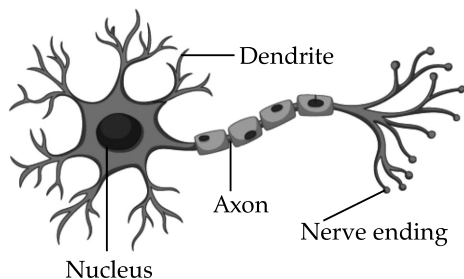
Ans.(i)(a) Increased ATP demand triggers the negative feedback regulation of thyroid hormone secretion.

(b) Insufficient availability of iodine in the soil of hilly areas also causes most people to suffer from goitre.

(ii) Pulmonary circulation
Systemic circulation

(iii) There are three main steps of urine formation: glomerular filtration, reabsorption and secretion.

(iv)



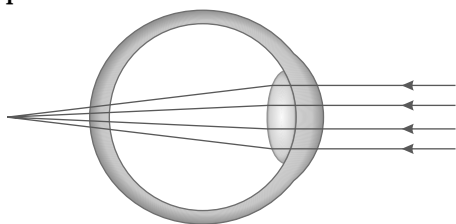
(label any two)

3. (i) What is Adrenal Virilism? What causes this condition? [2]

(ii) Which is the light sensitive layer of the eyeball? [2]

Where exactly is the image formed on this layer?

(iii) Study the diagram given below and answer the questions that follow : [3]



(a) Identify the defect of the eye by mentioning the technical term.

(b) Mention one reason for this defect.

(c) Name the type of lens used to correct this defect.

(iv) Give the biological terms for the three tiny bones present in the middle ear. [3]

Ans. (i) Adrenal virilism is a syndrome in which the excessive production of adrenal androgens causes virilization. Virilization is a condition in which a female develops male secondary sexual characteristics, like a beard, moustache, and even a deepening and hoarsening of voice. Adrenal virilism is caused due to excess production of androgens from the adrenal cortex in females.

(ii) The retina is the light-sensitive tissue layer at the back of the eye. It has special cells called photoreceptors that turn the light into electrical signals. Image is formed in front of retina. (2)

(iii) (a) Long-sightedness, also known as hypermetropia or hyperopia.

(b) Eyeball is too short or the lens cannot become round enough, causing the eye to not have enough power to see close or nearby objects.

(c) This defect can be corrected by using a convex lens.

(iv) There are three tiny bones in the ear known as the Ear ossicles. They are : malleus, incus, and stapes.

4. (i) Name the endocrine gland that secretes Thyroxine. [2]

Give any one function of Thyroxine.

(ii) Give the full form of the abbreviation ACTH. [2]

Which gland secretes this hormone?

(iii) Define the term Synapse.

How are Cytons and Axons of neurons placed in the Cerebrum? [3]

(iv) Name the three membranous coverings of the human brain. [3]

Ans. (i) Thyroid gland secretes : thyroxine.

Function : It plays vital roles in heart and muscle function, brain development, digestion and maintenance of bones.

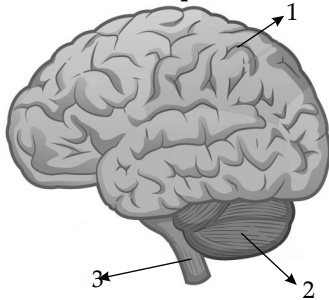
(ii) Adrenocorticotrophic Hormone.

ACTH is a hormone produced by the pituitary gland, a small gland at the base of the brain. (2)

(iii) Synapse is the site of transmission of electric nerve impulses between two neurons or between a neuron and a gland or muscle cell (effector).

The inner portion of the cerebrum consists of white matter, mainly containing the axons (nerve fibers) of the neurons. The cytons of the neurons are present in the outer layers of cerebrum and outer layer of the brain looks dull grey in color.

- (iv) 1. The dura mater (outer layer) 2. The arachnoid mater (inner layer) 3. The pia mater (middle layer).
5. (i) Name the nerve that transmits impulses to the brain from : [2]
 (a) Ear (b) Eye
- (ii) A mature mammalian erythrocyte lacks nucleus and mitochondria but is efficient in its functioning. Explain by giving suitable reasons. [2]
- (iii) The diagram given below is that of a human brain. Answer the questions that follow : [3]



- (a) Label the parts numbered 2 and 3.
 (b) State any one function of the part numbered 1.
 (iv) What is a reflex action? Name the two types of reflexes. [3]

Ans.

- (i) (a) Auditory nerve
 (b) Optic nerve
- (ii) A mature erythrocyte lacks nucleus and mitochondria so as to make a place for more haemoglobin and hence more oxygen molecules. Also, without these organelles, it provides a specific biconcave appearance of RBCs that allows efficient diffusion. Young mammalian RBCs have nucleus.
- (iii) (a) 2-Cerebellum, 3-medulla oblongata.
 (b) The part labelled as 1 is cerebrum. Cerebrum initiates and coordinates movement and regulates temperature of the body.
 (iv) Reflex action is a rapid and automatic response to a stimulus. It is not under the voluntary control of the brain. The two types of reflexes are natural reflexes and conditional reflexes.
6. (i) Give the exact location of Pulmonary semilunar

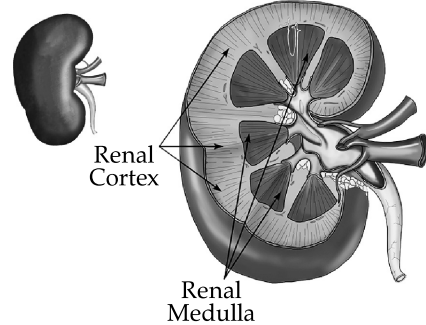
- valve. When does it close? [2]
 (ii) Name the hormones whose deficiency causes : [2]

- (a) Diabetes mellitus
 (b) Diabetes insipidus
 (iii) Draw a neat diagram of a longitudinal section of a human kidney and label Renal Cortex and Renal Medulla on the diagram. [3]
 (iv) Mention one function for each of the following: [3]
 (a) Lymphocytes
 (b) Thrombocytes
 (c) Neutrophils

Ans. (i) The Pulmonary semilunar valve is located in the right ventricle of the heart. It is an opening of the right ventricle into the pulmonary artery. It closes at the diastolic phase of the cardiac cycle.

- (ii) (a) Diabetes mellitus - Insulin
 (b) Diabetes insipidus - Vasopressin

(iii)



- (iv) (a) Lymphocytes are primarily involved in the body's immune response mechanism. Lymphocytes are responsible for antibody production, direct cell-mediated killing of virus-infected and tumor cells, and regulation of the immune response.
 (b) Thrombocytes help to form blood clots in order to slow or stop bleeding and help wounds to heal.
 (c) Neutrophils remove bacterial and fungal pathogens through a process known as phagocytosis. They travel to the site of infection, where they destroy the microorganisms by ingesting them and releasing enzymes that kill them.