

The following question paper is based only on the syllabus for Semester 2 examination. To test your knowledge on the remaining syllabus, kindly visit our website for an exhaustive MCQ based question bank.

## SCIENCE – SEMESTER 2 EXAMINATION

### Solved Paper-3 (Biology), 2022

(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 I and any **three** questions from Section II.  
The intended marks for questions or parts of questions are given in brackets [ ].

### SECTION A

Attempt **all** questions from this section

#### QUESTION 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

**Ans.** (b) Iron

(ii) The number of cranial nerves in humans are :

- (a) 12                                      (b) 31 pairs                                      (c) 31                                      (d) 12 pairs

**Ans.** (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

**Ans.** (a) Hypersecretion of Growth hormone

(iv) Pericardium covers the :

- (a) Heart                                      (b) Brain                                      (c) Spinal cord                                      (d) Eyeball

**Ans.** (a) Heart

(v) The circular opening in the centre of iris :

- (a) Lens                                      (b) Cornea                                      (c) Sclera                                      (d) Pupil

**Ans.** (d) Pupil

(vi) The blood vessel that carries oxygenated blood is :

- (a) Pulmonary artery                      (b) Pulmonary vein                      (c) Renal vein                      (d) Hepatic vein

**Ans.** (b) Pulmonary vein

(vii) Organ of Corti is present inside the :

- (a) Cochlea                                      (b) Semicircular canals                      (c) Sacculus                      (d) Utriculus

**Ans.** (a) Cochlea

(viii) The structure that stores urine temporarily is :

- (a) Ureter                                      (b) Urethra                                      (c) Urinary bladder                      (d) Kidneys

**Ans.** (c) Urinary bladder

(ix) Islets of Langerhans are located in :

- (a) Liver                                      (b) Pituitary gland                      (c) Spleen                      (d) Pancreas

**Ans.** (d) Pancreas



(x) The main nitrogenous waste formed in the human body :

(a) Uric acid

(b) Urea

(c) Ammonia

(d) Creatinine

**Ans.** (b) Urea

## SECTION B

Attempt any **three** questions from this Section

### QUESTION 2

(i) Simple goitre is usually seen in people living in the hilly regions. Give two reasons for the statement. [2]

**Ans.** (a) Iodine content of the soil is low.

(b) Deficiency of Iodine in water/food, etc.

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

**Ans.** Two types of blood circulation in humans :

(a) Pulmonary circulation

(b) Systemic circulation

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

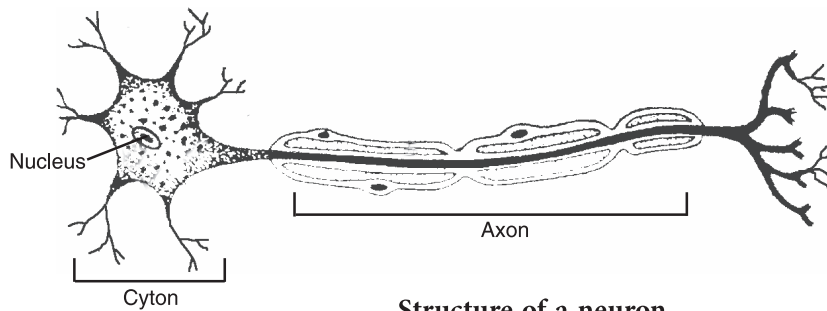
**Ans.** (a) Ultrafiltration

(b) Reabsorption/selective absorption

(c) Tubular secretion

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

**Ans.**



Structure of a neuron

### QUESTION 3

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

**Ans.** The condition in which a mature woman develops certain male characteristics such as beard, moustache and deep male voice is termed as **adrenal virilism**.

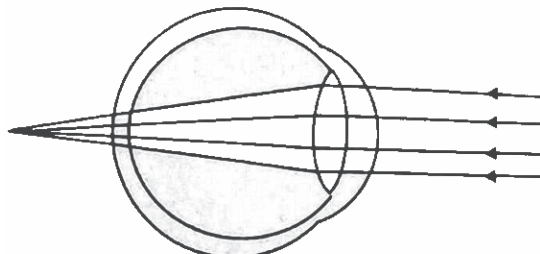
It is caused due to an overgrowth of adrenal cortex in a mature woman.

(ii) Which is the light sensitive layer of the eyeball ? Where exactly is the image formed on this layer ? [2]

**Ans.** Retina is the light sensitive layer of the eyeball.

The image is formed at yellow spot/Macula lutea/fovea centralis of 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.

**Ans.** (a) Hypermetropia/Hyperopia  
 (b) Shortening of the eyeball from front to back.  
 (c) Biconvex (converging) lens.

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

**Ans.** (a) Malleus (b) Incus (c) Stapes; collectively called as ear ossicles

#### QUESTION 4

- (i) Name the endocrine gland that secretes Thyroxine. Give any one function of Thyroxine. [2]

**Ans.** Thyroid gland.  
 Thyroxine regulates the basal metabolism of the body.

- (ii) Give the full form of the abbreviation ACTH. Which gland secretes this hormone ? [2]

**Ans.** ACTH : Adreno Cortico Tropic Hormone  
 It is secreted by anterior lobe of the pituitary gland.

- (iii) Define the term 'Synapse'. How are Cytons and Axons of neurons placed in the Cerebrum ? [3]

**Ans.** A synapse represents the area of contact between the axon of one neuron and the dendrite of another neuron with a microscopic gap in between. Cytons are arranged towards the outer side whereas axons are placed towards the inner side of the cerebrum.

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

**Ans.** (a) Dura mater (b) Arachnoid (c) Pia mater

#### QUESTION 5

- (i) Name the nerve that transmits impulses to the brain from : [2]

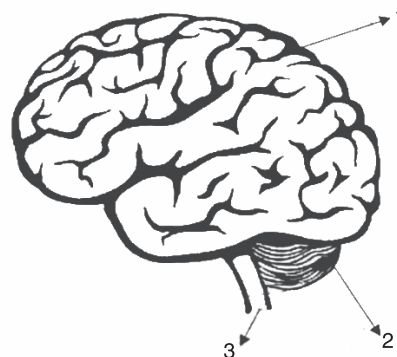
- (a) Ear (b) Eye

**Ans.** (a) Ear - Auditory Nerve  
 (b) Eye - Optic Nerve

- (ii) A mature mammalian erythrocyte lacks nucleus and mitochondria but is efficient in its functioning. Explain by giving suitable reasons. [2]

**Ans.** (a) Lack of nucleus : makes the red blood cells biconcave, thus increasing the surface area for absorbing and transporting more amount of oxygen.  
 (b) Lack of mitochondria : means that the red blood cells cannot use oxygen for themselves. Thus all the oxygen absorbed from the lungs is transported and delivered to the tissues.

- (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.

**Ans.** (a) 2 - Cerebellum 3 - Medulla oblongata  
 (b) 1 - Cerebrum enables us to think/reason out.



(iv) What is a reflex action ? Name the two types of reflexes. [3]

**Ans. Reflex action** is an automatic/quick/immediate involuntary action in the body of living beings brought about by a stimulus and regulated by the spinal cord.

Types of reflexes :

- (a) Natural (inborn) reflexes
- (b) Conditioned (acquired) reflexes

### QUESTION 6

(i) Give the exact location of Pulmonary semilunar valve. When does it close ? [2]

**Ans.** Pulmonary semilunar valve is located at the opening of the right ventricle into the pulmonary artery. This valve closes during atrial systole.

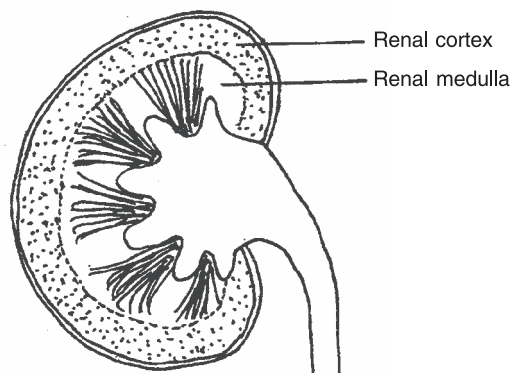
(ii) Name the hormones whose deficiency causes : [2]

- (a) Diabetes mellitus
- (b) Diabetes insipidus

**Ans.** (a) Insulin  
(b) Vasopressin/Antidiuretic Hormone (ADH)

(iii) Draw a neat diagram of a longitudinal section of a human kidney and **label Renal Cortex and Renal Medulla** on the diagram. [3]

**Ans.**



Longitudinal section of a human kidney

(iv) Mention one function of each of the following : [3]

- (a) Lymphocytes
- (b) Thrombocytes
- (c) Neutrophils

**Ans.** (a) Lymphocytes : Produce antibodies  
(b) Thrombocytes : Clotting of blood (coagulation)  
(c) Neutrophils : Engulf bacteria (Phagocytosis)