

Very Short Answer Type Questions

[1 mark]

Q. 1. Mention the receptors for light and sound in animals.

Ans. Sense organs are called receptors. The receptor of light in animals is called photoreceptor. The receptor of sound in animals is called phonoreceptor.

Q. 2. Which hormone regulates the concentration of sugar in the blood?

Ans. Insulin secreted by Islets of Langerhans of pancreas.

Q 3. Define 'reflex action.'

Ans. Reflex action is a rapid, automatic response to a stimulus which is not under the voluntary control of the brain.

Q. 4. Name few involuntary actions controlled by the hindbrain.

Ans. Involuntary actions controlled by hindbrain are vomiting, salivation and blood pressure.

Q.5. What is an axon?

Ans. It is a large, single, unbranched nerve fibre arising from the cyton. It carries impulses from cyton located in CNS to effectors.

Q. 6. Why are roots called positively geotropic?

Ans. This is because the roots always grow towards the gravity of the Earth.

Q .7. What is the number of cranial nerves and spinal nerves in human beings?

Ans. There are 12 pairs of cranial nerves and 31 pairs of spinal nerves in human beings.

Q. 8. Name the largest cell present in the human body.

Ans. Neuron

Q. 9. Which part of central nervous system controls reflexes?

Ans. Spinal cord

Q. 10. Name the part of neuron

(a) where information is acquired.

(b) through which information travels as an electrical impulse.

Ans. (a) Dendrite, (b) Axon.

Q.11. What will happen if intake of iodine in our diet is low?

Ans. (i) When iodine intake is low, release of thyroxine from thyroid gland will be less by which protein, carbohydrate and fat metabolisms will be affected.

(ii) A person might suffer from goitre in case of iodine deficiency in the body.

Q. 12. Which hormone controls the metabolism of calcium and phosphorus in human beings?

Ans. Parathyroid hormone (parathormone)

Q. 13. Name the hormone, the secretion of which is responsible for dramatic changes in appearance in girls and boys when they approach 10-12 years of age.

Ans. Oestrogen from the ovaries of girls and testosterone from testes of boys.

Q. 14. Name two tissues that provide control and coordination in multicellular animals.

Ans. The two tissues that provide control and coordination in multicellular animals are nervous tissue and muscular tissue.

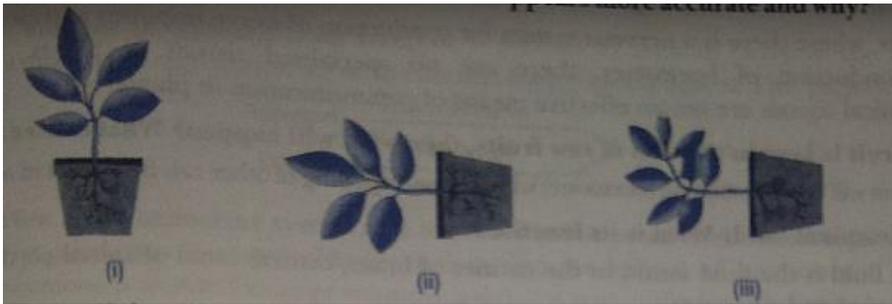
Q. 15. Which hormone helps in lowering the level of blood glucose in human beings?

Ans. Insulin

Q. 16. What do you understand by the sleep movement of plant organs?

Ans. Sleep movement in plants e.g., in flowers is to protect the reproductive organs from the cold. Hence, sepals and petals of saffron flower close at sunset and open up in the morning.

Q. 17. In the figure below (i), (ii) and (iii), which appears more accurate and why?



Ans. Figure (i) is more appropriate because in a plant, shoots are negatively geotropic hence, grow upwards and roots are positively geotropic so they grow downwards.

Q. 18. State the main function of abscisic acid in plants.

Ans. Abscisic acid slows plant growth and inhibits division of cells.

Short Answer Type Questions – I

[2 marks]

Q.1. Define a synapse.

Ans. Synapse is a very fine gap between telodendria of axon of one neuron and dendrites of another neuron. These two structures do not unite with each other but remain separated by a fine gap.

Q.2. Mention the functions of forebrain.

Ans. The forebrain performs the following functions:

- (i) It is responsible for intelligence, memory, consciousness, willpower and voluntary actions.
- (ii) It has the centres for visual reception, hearing reception, touch, smell and temperature reception.

Q. 3. Answer the following:

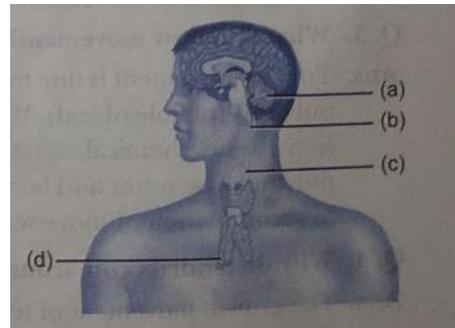
- (i) Which hormone is responsible for the changes noticed in females at puberty?
- (ii) Dwarfism results due to deficiency of which hormone?
- (iii) Blood sugar level rises due to deficiency of which hormone?
- (iv) Iodine is necessary for the synthesis of which hormone?

Ans. (i) Oestrogen (ii) Growth hormone
(iii) Insulin (iv) Thyroxine

Q. 4. Label the endocrine glands in figure.

Ans. The endocrine glands are as follow:

- (a) Pineal gland (b) Pituitary gland
- (c) Thyroid gland (d) Thymus



Q.5. Name the hormones responsible for regulation of

- (i) metabolism of carbohydrates, fats and proteins.
- (ii) balance of calcium and phosphate.
- (iii) blood pressure.
- (iv) water and electrolyte balance.

Ans. (i) Thyroxine
(ii) Parathormone

- (iii) Adrenaline
- (iv) Vasopressin

Q. 6. Why Mimosa pudica (touch-me-not) leaves droop down when touched?

Ans. It is due to turgor pressure difference between the upper and lower halves of the base of petiole (pulvinus). Lower half cells lose water and upper half cells of pulvinus become turgid due to transfer of water from lower cells. Thus, the entire leaf droops down when touched.

Q. 7. Why are the electrical-chemical signals not an efficient means of communication in plants?

Ans. Unlike animals, where there is a nervous system for conduction of nerve impulses and circulatory system for conduction of hormones, there are no specialised tissues in plants, so the electrical-chemical signals are not an effective means of communication in plants.

Q.8. If a ripened fruit is kept in a basket of raw fruits, then what will happen? What causes it?

Ans. The ripened fruit will release ethylene (hormone) which causes ripening of other raw fruits kept in a basket.

Q. 9. What is cerebrospinal fluid? What is its function?

Ans. Cerebrospinal fluid is the fluid found in the cavities of brain, central canal of spinal cord and in between arachnoid and pia mater.

Function: It prevents the brain from mechanical shocks.

Short Answer Type Questions – II

[3 marks]

Q. 1. What are the advantages of the fact that most reflex actions are governed by spinal cord?

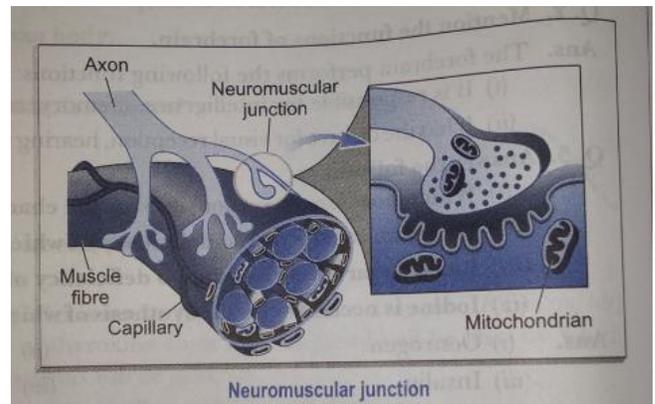
Ans. The advantages are:

- (i) This enables the body to give quick responses to harmful stimuli thus protecting the body.
- (ii) It minimises overloading of brain.
- (i) In many animals, reflex arcs have evolved as efficient ways of functioning in the absence of true thought processes.

Q. 2. How do animal muscles move?

Ans. The nerve fibres at the end of a neuron are attached to muscles. This area is called neuro-muscular junction. When nerve impulses are conducted to this area, the special proteins present in the muscle cells change their shape and arrangement in the cell in response to nervous electrical impulses. New arrangement of these proteins give the muscle cells a shorter form thus

bringing about movement of muscles.



Q. 3. What is turgor movement?

Ans. Turgor movement is due to the difference of turgidity of the cells in the lower half and upper half of pulvinus (petiole of leaf). When leaf of touch-me-not plant (*Mimosa pudica*) is touched, the electrical signal send chemical signals from leaflets to pulvinus (petiole) of leaf. Cells in the lower half of pulvinus lose water and become flaccid, while cells in the upper half of pulvinus become turgid due to pulvinus lose water and become flaccid, while cells in the upper half of pulvinus become turgid due to accumulation of more water. Hence, leaf droops down for a short time.

Q. 4. Why do tendrils coil around hard rough objects?

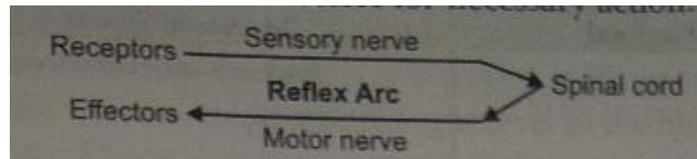
Ans. The growth movement of tendril in response to unilateral stimulus of touch is called thigmotropism. Tendrils of lounki, tori, karela, and sweet pea plants coil around hard objects when they come in their contact. It occurs due to unequal growth of two sides of a tendril. The growth of the surface which comes in contact of the support is retarded, while it remains normal or increased on the other side, due to which tendril coils around the support.

Q. 5. Why is pancreas called a 'dual function' gland? Write the names of its hormones.

Ans. Pancreas is an exocrine gland as well as an endocrine gland. Exocrine part of the gland secretes digestive enzymes and the endocrine part (Langerhan's cells) produce hormones. Hormones secreted by pancreas are insulin and glucagon.

Q.6. How is reflex arc formed?

Ans. A message or stimulus from receptor is relayed by sensory nerve to the spinal cord. It sends response through motor nerve to effectors for necessary action. This pathway is the reflex arc.



Q. 7. How is the endocrine system able to maintain hormonal concentration in the body?

Ans. Hypothalamus is responsible for maintaining the balance of hormones in the body. When any hormone is secreted in large amounts, a signal is sent by the hypothalamus to the secreting gland to lower its secretion. Whereas when the amount of any hormone is less, hypothalamus sends a signal to the respective gland to increase its functioning.

Q. 8. Define 'nerve impulse'. Which structure in a neuron helps to conduct a nerve impulse

(i) towards the cell body? (ii) away from the cell body?

Ans. The information passing through neurons is in the form of chemical and electrical signals, called nerve impulse.

(i) Towards the cell body: Dendrites. (ii) Away from the cell body: Axon.

Q. 9. Nervous and hormonal system together perform the function of control and coordination in human beings. Justify the statement.

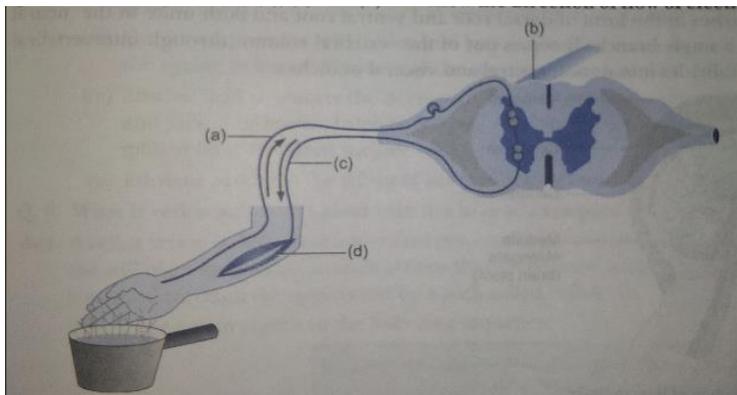
Ans. Nervous and hormonal system together perform the function of control and coordination in human beings. Let us take an example, in the case of any emergency, stimulus is being perceived by CNS (nervous system). The stimulus is analysed and the response is sent to the effectors. Simultaneously, sympathetic nerves stimulate adrenal gland to release adrenaline which regulates blood pressure, increases heartbeat, constricts blood vessels and dilates pupil, etc. So, both nervous and endocrine systems interact and overcome the crisis together.

Q.10. How are the brain and spinal cord protected?

Ans. (i) Brain: It is protected by the bony box-cranium, also called as skull. Also the membranes that surround the brain (meninges) are filled with cerebrospinal fluid that act as shock absorbers protecting the brain.

(ii) Spinal cord: The vertebral column, commonly called backbone, protects the spinal cord.

Q.11. Label the parts (a), (b), (c) and (d) and show the direction of flow of electrical signals in the figure.



Ans. (a) Sensory neuron (b) Spinal cord (CNS)
(c) Motor neuron (d) Effector-muscle in arm

Flow of electrical signals: Receptors in hand ⇒ Sensory neurons ⇒ spinal cord (CNS)
Motor ⇒ neurons ⇒ Effector – muscles in arm.

Q. 12. Name those parts of the flower which serve the same function as the following do in the animals:

(i) Testis (ii) Ovary (iii) Eggs Sperms

Ans.

| In case of animal | In case of flower |
|-------------------|--------------------------|
| Testis | Anther/stamen/androecium |
| Ovary | Ovary |
| Eggs | Ovules |
| Sperms | Pollen grains |

Long Answer Type Questions

[5 Marks]

Q. 1. Differentiate between tropic and nastic movements in plants.

Ans.

| Tropic movements | Nastic movements |
|---|---|
| <p>1. It can be easily observed in stems and roots.</p> <p>2. It is due to unilateral stimulus which causes unequal growth on the two sides of a stem, root and tendril.</p> <p>3. Movement is related to stimulus, i.e., plant organs either move towards source of stimulus or away from it. Stimuli which causes movement in plants are gravity, light, touch, water and chemical substance.</p> <p>4. Example: Bending of root towards gravity and shoot towards light.</p> | <p>1. It is clearly observed in bilaterally symmetrical organs such as leaves and petals of flowers.</p> <p>2. The movements occur due to stimulus of light and temperature.</p> <p>3. Opening and closing of flowers of evening primrose and tobacco at the night and day respectively. This is due to unequal growth.</p> <p>4. Example: Leaves of 'touch-me-not' plant bend and droop on touching.</p> |

Q. 2. (i) What are cranial and spinal nerves? Describe a spinal nerve.

(ii) Draw a diagram of the human brain and label the following parts:

(a) Cerebrum

(b) Meninges

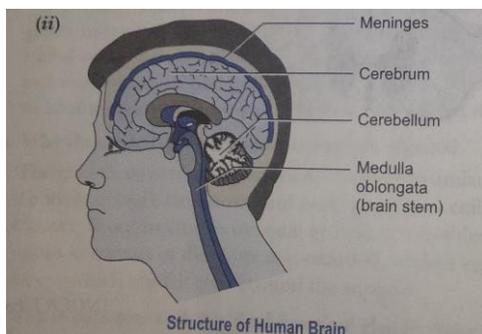
(c) Medulla oblongata

(d) Cerebellum

Ans. (i) Cranial nerves arise in pairs from the various parts of brain and are 12 pairs in number.

Spinal nerves arise from the spinal cord in 31 pairs.

Spinal nerve arises in the form of dorsal root and ventral root and both unite in the neural canal to form a single branch. It comes out of the vertebral column through intervertebral canal and then divides into dorsal, ventral and visceral branches.



Q. 3. Which hormone is released into the blood when its sugar level rises? Name the organ which produces the hormone and describe its effect on blood sugar level. Also name one digest enzyme that this organ secretes and the function of this enzyme.

Ans. Insulin hormone is released into the blood when its sugar level rises. Pancreas secretes the insulin hormone. The function of insulin hormone is to lower the blood sugar level. Deficiency of insulin hormone in the body causes a disease known as diabetes is characterised by large quantities of sugar in the blood. The insulin hormone controls the metabolism of sugar. If due to some reason, pancreas does not produce and secrete sufficient amount of insulin into blood, then the sugar level in the blood rises. The high sugar level in the blood can cause many harmful effects to the body of person. The person having severe diabetes are treated by giving injection of insulin. The pancreas secretes pancreatic juice which contains enzymes like trypsin for digesting proteins, lipase for breakdown of emulsified fats and amylase for breakdown of starch.

Q. 4. Describe the central nervous system in human beings.

Ans. The central nervous system in human beings consists of brain and spinal cord.

(i) Brain: Brain is the highest coordinating centre in the body. It is covered by meninges, which is made up of three layers. It is protected by cranium. Brain is broadly divided into:

(a) Forebrain: The forebrain includes cerebrum and olfactory lobes. Cerebrum is the largest part of the brain. It consists of two cerebral hemispheres. Sensory and motor receptors are present in the brain. There are various regions for reception of vision (occipital lobe), reception of sound (temporal lobe), touch, smell, temperature (parietal lobe) and muscular activities (frontal lobe). Olfactory lobes are one in pair and receives olfactory nerves.

(b) Midbrain: It is the small portion of the brain that connects cerebrum with the other parts of the brain and spinal cord.

(c) Hindbrain: It consists of cerebellum, pons and medulla oblongata. Cerebellum is responsible for coordination and adjustment of movement and posture. Pons regulate respiration. Medulla oblongata regulates swallowing, coughing, sneezing and vomiting.

(ii) spinal cord: Medulla oblongata extends downwards, enclosed in vertebral column to form a cylindrical structure known as spinal cord. It is also covered by meninges. It is the reflex centre of the body.

Q. 5. Give the various functions performed by the plant hormones.

Ans. The various functions performed by the plant hormones are:

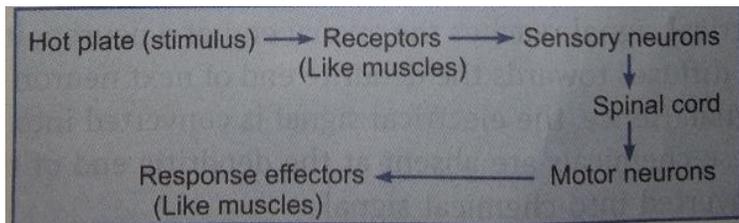
(i) Auxins promote cell enlargement and cell differentiation. They also promote growth.

- (ii) Gibberellins promote cell enlargement and cell differentiation in the presence of auxin. It also help in breaking the dormancy in seeds and buds. It promote the growth in fruits.
- (iii) Cytokinins promote cell division and help in breaking the dormancy of seeds and buds. It delay the ageing in leaves. It promotes the opening of stomata and also fruit growth.
- (iv) Abscisic acid promotes the dormancy in seeds and buds. It promotes the closing of stomata and falling of leaves. Inhibits growth, reverses the growth promoting effects of auxins and gibberellins. Its effects include wilting of leaves.
- (v) Ethylene promotes the falling of leaves, ripening of fruits and helps in breaking bud dormancy.

Q 6. What is reflex action? Explain with the help of examples.

Ans. A reflex action is defined as a spontaneous, automatic and mechanical response to a stimuli without the will of an individual. In such actions there is no involvement of the brain. All reflex actions are conveyed through the spinal cord by a path called reflex arc.

The reflex action travels in the following sequence:



The reflex arc constitutes the following components:

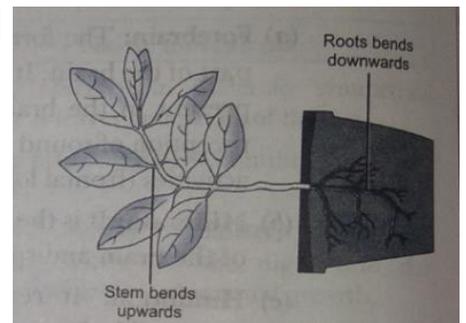
- (i) A receptor to perceive the stimulus.
- (ii) A sensory or afferent nerve which carries the message from the receptor to the spinal cord.
- (iii) The neurons of spinal cord transmit the impulse from afferent neurons to efferent neurons.
- (iv) The motor or efferent nerve carries messages from spinal cord to the muscles (effectors) that show the response.

Some examples of reflex actions are:

- (i) Blinking of eyes when a foreign particle gets in them.
- (ii) Sneezing if an unwanted particle enters the nose.
- (iii) Watering of mouth at the sight or smell of good food.
- (iv) Withdrawal of foot while walking if a nail comes in the way and pricks the foot.
- (v) Immediate withdrawal of hand of a person if some hot thing touches it.

Q. 7. With the help of an activity demonstrate geotropism in plants.

- Ans.** 1. Soak some seeds of gram or moong in water for one day.
 2. Pierce slightly big holes (2 mm diameter) at the bottom of



the cup.

3. Fill it with 1 cm thick layer of garden soil.

4. Sprinkle soaked seeds (moong/gram) over the soil. Water the seeds.

5. Put the cup on 2 pieces of wooden or stone slabs so that there is a little gap between the top of the table and bottom of the cup.

6. Cover the lower part of the set-up with black paper.

7. Water the seeds regularly with little water.

8. You will observe that the roots come out from the holes and grow towards the Earth showing positive geotropism.

HOTS (Higher Order Thinking Skills)

Q.1. Why do stem and root move (grow) towards light and the centre of gravity of the Earth respectively?

Ans. It is due to auxins (Plant hormones) produced by the shoot apex and root tip. In stem, growth is more on the shaded side (lower side of apex) due to accumulation of auxins. In root, growth is more on the illuminated side as auxins accumulated on the lower side (shaded side) of root tip inhibits the growth of that side. Thus, there is greater growth on the upper side (illuminated side), resulting in the growth of roots apex towards gravity of earth.

Q. 2. What is association neuron?

Ans. It is found in the cortex part of spinal cord in between the sensory neuron and motor neuron. It forms synapse with the axon of sensory neuron and dendrites of motor neuron.

Q.3. Why is the flow of signals in a synapse from axonal end of one neuron to dendritic end of another neuron but not the reverse?

Ans. When an electrical signal reaches the axonal end of a neuron, it releases a chemical substance. This chemical diffuses towards the dendrite end of next neuron where it generates an electrical impulse or signal. Hence, the electrical signal is converted into a chemical signal at the axonal end. Since these chemicals are absent at the dendritic end of the neuron, the electrical signal cannot be converted into chemical signal.

Q4. Sameer was studying in his room. Suddenly he smel 1s something burning and sees smoke in the room. He rushes out of the room immediately. Was Sameer's action voluntary or involuntary? Why?

Ans. Sameer's action was voluntary because rushing out of the room was under his conscious control. The smoke and smell were perceived by the receptors in the sense organs and signals are sent to the brain. The brain, then sent signals to the effector organs, i.e., the muscles, to move out of the room.

Value Based Questions

Q. 1. Mayank's father never bothered to check the brand/contents of the salt he had purchased from the market. Mayank noticed that her sister had developed swollen neck. The doctor advised her to eat iodised salt.

- (i) Name the disease from which Mayank's sister suffered.**
- (ii) Why has the doctor advised her to eat iodised salt?**
- (iii) How will this incidence influence Mayank's attitude towards health?**

Ans. (i) Goitre/Thyroid related disease.

(ii) Iodine present in iodised salt is needed to produce thyroxin hormone.

(iii) Mayank would become more careful regarding health, will be conscious of his diet and of people around him.

Q. 2. Rahul got a bike on his 18th birthday from his parents. His father instructed him to always wear helmet while driving. He reluctantly obeys him but does not tie the straps of helmet properly.

- (i) According to you, what danger Rahul can face in future while he is driving his bike.**
- (ii) Which vital organ/organs get protection by wearing the helmet while driving the two wheelers?**
- (iii) What values are being neglected by Rahul?**

Ans. (i) He may get head injury that may even prove fatal to him.

(ii) Brain, Eye.

(iii) Obeying traffic rules while travelling on the roads, be careful while driving, obeying instructions by elders.