CLASS X: SCIENCE
Chapter 6: Control and Coordination

Questions and Solutions | Page No. 105 - NCERT Books

Q1. What is the difference between a reflex action and walking?

Ans. What is the difference between a reflex action and walking ?

Reflex action	Walking
1. Reflex action is the immediateand involuntary action	1.Walking is a voluntary action which is controlled.
2. It is conducted by the spinal cord.	2.It is controlled by hind-brain (by cerebellum)
3. It occurs in a fraction of seconds.	3. It takes longer time.

Q2. What happens at the synapse between two neurons ?

Ans. The neurons lie end to end in a chain to transmit the impulses in an animal body. The neurons are not connected. There occurs a very minute gap between terminal portion of axon of one neuron and dendron of the other neuron. This gap is called synapse. At the end of the axon, the electrical impulse sets off the release of some chemicals. These chemicals cross the gap (synapse), and start a similar electrical impulse in dendrite of the next neuron.

Synapses actually act like one way valves. This is because the chemical substance is present at only one side of the gap. In this way synapses ensures that nerve impulse travels only in one direction.

Q3. Which part of the brain maintains posture and equilibrium of the body?

Ans. Cerebellum.

Q4. How do we detect the smell of an agarbatti (incense stick)?

Ans. When agarbatti burns, its pleasant small is dected by the olfactory receptor present inside the nose. the action of smell genrates the electrical impluse which are carried to hypothalamus of brain thus we detect the smell of agarbatti.

Q5. What is the role of the brain in reflex action?

Ans. The reflexes which involve only the spinal cord are called spinal reflexes. The spinal reflexes are produced in the spinal cord but the message of reflex action taken also goes on to reach the brain where the thinking process occurs. Some reflex arcs involve the brain, rather than the spinal cord only. They are called cerebral reflexes. Closing of eyes when exposed to flash of light and salivation at the sight of tempting food are the examples of cerebral reflexes.

Questions and Solutions | Page No. 108 - NCERT Books

Q1. What are plant hormones?

Ans. Plant hormones help to coordinate growth, development and response to the environment. They are synthesized in minute quantity in one part of the plant body and simply diffuse to another part, where they influence specific physiological processes. Example Auxins.

Q2. How is the movement of leaves of the sensitive plant different from the movement of a shoot towards light?

Ans.

movement of a shoot towards light	movement of leaves of the sensitive plant
Direction of movement is in the direction of the stimulus.	Movement are non directional.
Growth takes place.	Growth does not take place.
Movements are slow.	Movements are fast.

Q3. Give an example of a plant hormone that promotes growth.

Ans. Auxins

Q4. How do auxins promote the growth of a tendril around a support?

Ans. When the tip of the tendril touches a support, then the auxins present on its tip moves to the side of tip which is away from the support, so, due to more auxins in its tendrils away from the support grows faster.

Q5. Design an experiment to demonstrate hydrotropism.

Ans. Aim **:** To demonstrate that root shows hydrotropism.

Method

Place germinating seeds in moist saw dust contained in a sieve.

Observation

(i) The radicles pass down and come out of the sieve pores under the influence of gravity.

(ii) After some growth, radicles move back and enter the saw dust again.

Conclusion

(i) This shows that roots shows both hydrotropic response and geotropic response.

(ii) The hydrotropic response of root are stronger than geotropic response.

Questions and Solutions | Page No. 111 - NCERT Books

Q1. How does chemical coordination take place in animals?

Ans. Hormones –They are secretions of the endocrine glands and one of the most important substance that controls the body chemistry. Also known as "Chemical messengers."

Q2. Why is the use of iodised salt advisable?

Ans. Iodine is important for the thyroid gland to make thyroxin hormone. Thyroxine regulates carbohydrates, proteins and fat metabolism in the body so as to provide the best balance for growth. If iodine is deficient in the diet, thyroxine cannot be produced and the thyroid gland at the neck swells, a condition called goitre. Use of iodized table-salt can provide the required amount of iodine in the diet.

Q3. How does our body respond when adrenaline is secreted into the blood?

Ans. Adrenal glands release adrenaline into blood.

(i) The heart begins to beat faster resulting in supply of more oxygen to the muscles.

(ii) The blood to the digestive system and skin is reduced due to the contraction of smooth muscles around small arteries in these organs. This diverts the blood to our skeletal muscles.

(iii) The breathing rate increases because of the contraction of the diaphragm and the rib muscles.

(iv) All these responses together enable the body to be ready to deal with the situation.

Q4. Why are some patients of diabetes treated by giving injections of insulin?

Ans. This is a hormone which is produced by the pancreas and helps in regulating blood sugar levels. If it is not secreted in proper amounts, the sugar level in the blood rises causing many harmful effects.

EXERCISES

Q1. Which of the following is a plant hormone?

(A) Insulin

(B) Thyroxin

(C) Oestrogen

(D) Cytokinin.

Ans. (D) Cytokinin.

Q2. The gap between two neurons is called a

(A) dendrite.

(B) synapse.

(C) axon.

(D) impulse.

Ans. (B) synapse.

Q3. The brain is responsible for

(A) thinking.

(B) regulating the heart beat.

(C) balancing the body.

(D) all of the above.

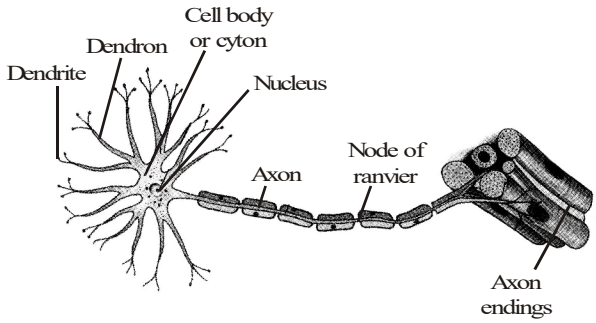
Ans. (D) all of the above.

Q4. What is the function of receptors in our body ? Think of situations where receptors do not work porperly. What problem are likely to arise ?

Ans. All information from environment is detected by receptors. Receptors pass information in the form of electrical impulses to brain by nerve cells and brain send information to effector organs for response. When receptors do not work properly, information from environment (stimuli) cannot be detected and our body cannot respond accordingly.

Q5. Draw the structure of a neuron and explain its function.

Ans.



Function of a neuron :

(i) It helps in conducting impulses which enables the organism to show responses towards the stimuli.

(ii) It helps in regulating control and coordination in animals.

Q6. How does phototropism occur in plants ?

Ans. The response of a plant towards light is called as phototropism. If the plant part moves towards light, it is called positive phototropism. however, if the plant part moves away from light, then it is called negative phototropism.

The stem (or shoot) of a growing plant bends towards light, so the stem (or shoot) of plant shows positive phototropism. On the other hand, the roots of a plant move away from light, so the roots of a plant show negative phototropism.

Q7. Which signals will get disrupted in case of a spinal cord injury ?

Ans. Spinal cord is an important component of Central Nervous system. It serves as a two way conduction path between peripheral nervous system and brain. The controlling centres in different areas of spinal cord function as reflex centres which control all the spinal reflexes. An injury in the spinal cord will disrupt the reflexes. The part of the body affected will depends upon the region where the spinal cord is injured. It may be neck, thoracic or abdominal region.

Q8 How does chemical coordination occur in plants ?

Ans. It is necessary that all parts of body of an organisms work together to give correct movement in response to the stimuli. So living organisms must use system providing control and coordination. In higher organisms nervous system and endocrine system together perform this function. And in plants phytohomones coordinate movement, growth etc.

Q9. What is the need for a system of control and coordination in an organisms ?

Ans. Multicellular organisms have diverse structure and functions. There are different system which perform specific function but the functioning of one system is not independent from the other. There is integration of all functional acitivities of the organism. For example, digestive enzymes are secreted into the food canal only when there is a food.

The integration is possible because of communication and control. Communication makes control possible. The control and coordination occurs by two systems, i.e.,

(i) by the release of chemical messengers called the hormones from endocrine system

(ii) by the conduction of nerve impulse, i.e. nervous system.

Q10. How are involuntary actions and reflex actions different from each other ?

Ans. Reflex actions are sudden, unconscious automatic response to some change in environment. It is controlled by spinal cord. On the other hand, involuntary actions also occur without the will of animals but these actions are controlled by either mid brain or hind brain.

Q11. Compare and contrast nervous and hormonal mechanisms for control and coordination in animals.

Ans.

Difference between Nervous and Hormonal Coordination	
Nervous Coordination	**Hormonal Coordination**
It is sent as an electrical impulse along axons, and as a chemical across synapse.	It is sent as a chemical messenger via blood stream.
Information travels rapidly, in milliseconds	Information travels slowly
Information is directed to specific receptors–one or a few nerve fibres, gland cells or other neurons.	Information is spread throughout the body by blood from which the target cells or organs pick it up.
It gets response immediately	It gets response usually slowly
Its effects are short-lived	Its effects are generally more prolonged

Q12. What is the difference between the manner in which movement takes place in a sensitive plant and the movement in our legs ?

Ans. Movement takes place in sensitive plant due to turgor changes (changes in amount of water) which is effected by phytohormones. But movement in our leg is a voluntary action under the control of our will. Such movement are controlled by hind brain.