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**CONTROL AND COORDINATION****TEXTBOOK QUESTIONS AND THEIR ANSWERS****Q.1. How does control and coordination take place in plants?**

**Ans.** The function of control and coordination in plants is performed by chemical substances known as plant hormones or phytohormones.

The synthesis and action of phytohormones are greatly influenced by external stimuli.

Plants respond to photoperiodic stimulus by specialised pigment present in very small quantity called phytochrome. Thus, phytohormones and phytochromes together are involved in control and coordination between environment and plant responses.

**Q.2. What are plant hormones?**

**Ans.** In plants, certain chemical substances are necessary for the purpose of proper growth and development. These chemical substances are called plant hormones or phytohormones. These are the most important coordinating substances in plants.

Examples are : auxin, gibberellin, cytokinin, ethylene, and abscisic acid.

**Q.3. How is the movement of leaves of the sensitive plant different from the movement of a shoot towards light?**

**Ans.** In case of sensitive plants, the information about the leaf being touched has been communicated. The plants use electrical-chemical means to convey the information from cell to cell.

In the second case, growth occurs towards the direction of stimulus. Here, movement occurs through growth.

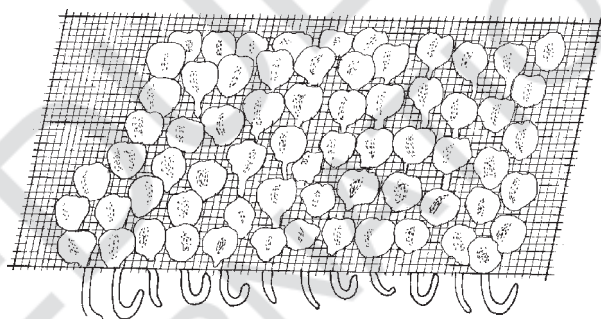
**Q.4. Design an experiment to demonstrate hydrotropism.**

**Ans.** To study the effect of water on plant movement

- (i) Take a wire mesh and cover it with moist saw dust.
- (ii) Place some germinated seedlings on the moist saw dust.

Leave the set up in an inclined position, and keep the saw dust moist. Make observations after 2-3 days.

The radicles will at first, grow in a downward direction (due to gravity; positively geotropic). Later on, the radicles bend toward the moist saw dust (positively hydrotropic).

**Q.5. Which part of the brain maintains posture and equilibrium of the body?**

**Ans.** The roof of the hindbrain forms a thickening which is called the cerebellum. This part of hindbrain is responsible for precise and accurate voluntary actions as well as for maintaining the posture and balance (equilibrium) of the body.

**Q.6. What happens at the synapse between two neurons?**

**Ans.** An impulse can travel across the synapse only from an axon to a dendrite. A synapse, thus acts as a valve to prevent the back flow of impulses. The impulse travels through neurotransmitters present in synapse.

**Q.7. What is the difference between a reflex action and walking?**

**Ans.** Reflex action is a rapid, automatic response which occurs at the level of spinal cord and does not involve brain for initiation. Walking is a voluntary action controlled by a part of hindbrain, the cerebellum.

**Q.8. Why is the use of iodised salt advisable?**

**Ans.** Iodine is essential for the synthesis of thyroxine. Thyroxine regulates metabolism and growth and several other functions. Thus, iodised salt is necessary for our body.

**Q.9. List any five differences between hormonal control and nervous control in human.**

| Ans. | Hormonal Control                                                                                                                                   | Nervous Control                                                                                                                                                                                                               |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | 1. Slow.<br>2. Effect is long lasting.<br>3. Affects the target organ.<br>4. Transmitted chemically.<br>5. Transmission takes place through blood. | Rapid and immediate.<br>Effect is short lived.<br>Affect particular muscles or a gland.<br>Transmitted electrochemically through nerve fibres and chemically across synapses.<br>No circulatory fluid like blood is involved. |

**Q.10. How do we detect the smell of an agarbatti?**

**Ans.** Smell of agarbatti is sensed by receptors present in the nose and the information is transmitted to olfactory lobe located in the fore-brain which interpret the information.

**Q.11. What is the role of the brain in reflex action?**

**Ans.** Reflex actions are under the control of spinal cord. Although, information input also goes on to reach the brain. The brain may store the experience for future.

**Q.12. How does our body respond when adrenaline is secreted into the blood?**

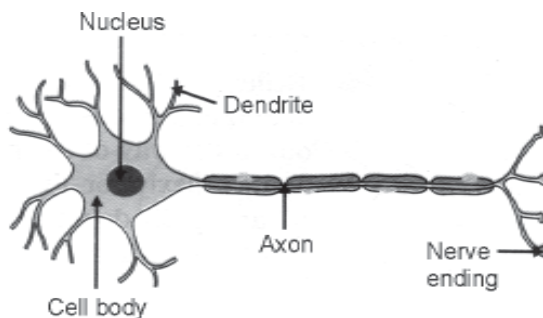
**Ans.** Adrenaline hormone is secreted by adrenal gland. This hormone is also called as emergency hormone. This hormone in condition of stress causes increase in the rate of heart beat. This results in supply of more oxygen to our muscles. The breathing rate also increases because of the contractions of the diaphragm and rib muscles. All these responses together enable the animal body to be ready to deal with stress situation.

**Q.13. What is the function of receptors in our body? Think of situations where receptors do not work properly. What problems are likely to arise?**

**Ans.** Receptors are specialised tips of some nerve cell that detect information from our environment. These receptors are located in our sense organs such as the inner ear, nose, tongue etc. If receptors do not work properly the information obtained from the environment will be delayed to reach brain or spinal cord.

**Q.14. Draw the structure of neuron and explain its function.**

**Ans.**

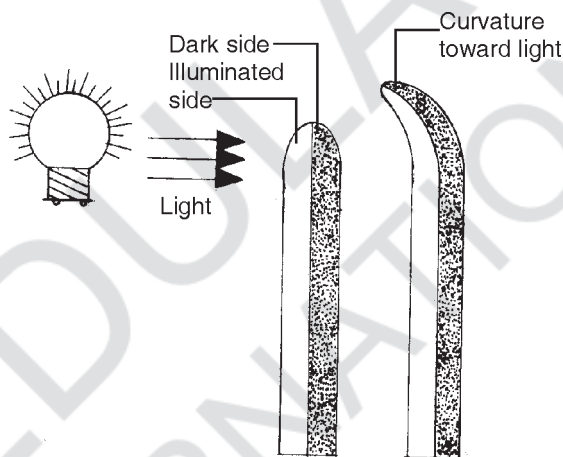


Structure of neuron

**Functions of Neuron** – Neuron is the structural and functional unit of nervous system. Neuron carries messages from sense organ to brain or spinal cord and vice versa.

**Q.15. How does phototropism occur in plants?**

**Ans.** Movement of a plant or its parts in response to light is called phototropism. Shoots generally grow towards light and said to be positively phototropic while roots grow away from light are said to be negatively phototropic.



**Bending of shoot towards light**

Plant hormone called auxin is responsible for phototropism. Auxin is synthesized at the shoot tips. When light falls on one side of the plant, auxin diffuses towards the shady or dark side of the shoot. More concentration of auxin on the dark side stimulates more cell elongation on this side than the lighted side. As a result dark side grows more and the shoot bends towards the light.

**Q.16. Which signals will get disrupted in case of spinal cord injury?**

**Ans.** Spinal cord controls reflex actions. In case of spinal cord injury, reflex actions will be disturbed. Spinal cord also act as a bridge

between nerves and brain. So, in case of spinal cord injury messages between nerves and brain can not be carried properly.

**Q.17. What is the need for a system of control and coordination in organism?**

**Ans.** In multicellular organisms body is very complex. Multicellular organisms have different organ or organ systems to perform different functions. Therefore, it is necessary that various parts of the body work together in a proper manner to produce proper reaction to a stimulus. For proper control and coordination, higher animals have evolved nervous system and endocrine glands.

**Q.18. Give an example of a plant hormone that promotes growth.**

**Ans.** Auxin is a growth promoting plant hormone.

**Q.19. How does chemical coordination take place in animals?**

**Ans.** Endocrine glands secrete animal hormones directly into the blood. This hormone reaches to the target organ/tissue/cell. The cells have special molecules on their surface to detect these chemical compounds and recognise the information a particular hormone is carrying. Then the cells act accordingly.

**Q.20. Why are patients of diabetes treated by giving injections of insulin?**

**Ans.** Insulin hormone regulates blood sugar levels. If this is not secreted in proper amount, the blood sugar level rises. This causes many harmful effects in the body. To check the increased level of blood sugar, the diabetic patients are treated by giving injections of insulin.

**Q.21. How are involuntary actions and reflex actions different from each other?**

**Ans.** Involuntary actions are controlled by brain, whereas reflex actions are controlled by spinal cord.

**Q.22. What is the difference between the manner in which movement in the sensitive plant and movement in our leg takes place?**

**Ans.** Sensitive plant e.g., 'touch-me-not' show quick movement of leaves in response to touch. This movement takes place due to the change in shape of plant cells. This change in shape is achieved by changing the amount of water in plant cells. In contrast movement in leg is a voluntary action which is controlled by cerebellum part of hind brain.

**Q.23. Which of the following is a plant hormone?**

- |               |               |
|---------------|---------------|
| (a) Insulin   | (b) Thyroxin  |
| (c) Oestrogen | (d) Cytokinin |

**Ans.** (d) Cytokinin.

**Q.24. The gap between two neurons is called a**

- |              |             |
|--------------|-------------|
| (a) dendrite | (b) synapse |
| (c) axon     | (d) impulse |

**Ans.** (b) synapse

**Q.25. 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.