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परमाणु ऊर्जा शिक्षण संस्था, मुंबई

**Atomic Energy Education Society**

**Session-2023-24**

**Class: X** **Subject: Science(Biology)**

**WORKSHEET NO-2 (Answer Key)**

**Name of the Chapter: Control and Coordination**

**Name of the Topic: Control and Coordination**

**I. Choose the correct option from the following.** **1x10=10**

1. (c) axon
2. (b) Motor nerves
3. (d) synapse
4. (a) thinking
5. (c) Cerebellum
6. (d) Iron is essential for the synthesis of thyroxin
7. (d) Insulin
8. (a) stimulus
9. (c) Cytokinin
10. (c) Hydrotropism

**II. Fill in the blanks with suitable word/s.** **1x10=10**

1. hormones
2. electrical
3. brain, spinal cord
4. cerebrum
5. Sublimation
6. growth
7. chemotropic
8. Thigmotropism
9. ADH
10. abscisic acid

**III. Answer the following questions.** **2x10=20**

1. Phytohormones are chemical substances, which are produced naturally in plants and are capable of translocation and regulating one or more physiological reactions when present in appropriate concentrations. The two phytohormones are auxins and gibberellins.
2. Photoreceptor is the receptor for light and photoreceptor is the receptor for sound in animals.
3. Tropic movement: The movement of a plant in the direction of stimulus.
   Nastic movement: The movements, which are neither towards nor away from the stimulus.
4. (i) Thyroid secretes thyroxin,
   (ii) Parathyroid secretes calcitonin and
   (iii) Pancreas secrete insulin and glucagon.
5. (i) growth hormone, (ii) adrenocorticotrophic hormone
6. Any chemical substance which is formed in the tissues of endocrine glands and are carried by the blood to other parts of the body for its specific actions is termed is hormone.
7. The two phytohormones, which are growth promoters are Auxins and Gibberellins.
8. The plant hormone responsible for the wilting and falling of leaves is Abscisic acid.
9. (a) Roots

   (b) Shoots
10. The non-directional movement of a plant part in response to an external stimulus is known as nastic movement. Example: The folding and drooping up of leaves in sensitive plants in response to touch.

**IV. Answer the following questions.** **3x5=15**

1. (a) Diseases due to the deficiency of
   (i) Iodine – Goitre
   (ii) Insulin – Diabetes.

   (b) The timing and amount of hormones released by various glands are controlled by the 'feedback mechanism' which is in-built in the body.
   For example, if the sugar level in the blood rises too much, they are detected by the cells of pancreas which respond by producing and secreting more insulin into blood. And as the blood sugar falls to a certain level, the secretion of insulin is reduced automatically.

2. (a) Reflex action. A reflex action is defined as a spontaneous, automatic and mechanical response to a stimulus without the will of an animal. 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.

(b) Synapse. A microscopic gap between a pair of adjacent neurons over which nerve impulses pass when going from one neuron to the next is called a synapse.

(c) Phototropism. It is the response of the plant parts to the external stimulus of light. The stem shows positive phototropism as the stem of the plant grows in the direction of light while root shows negative phototropism as the root of the plant grows away from the light. This growth is controlled by the auxin hormone.

3. A group of endocrine glands which produces various hormones is called an endocrine system. The endocrine system is also called hormonal system.

   The endocrine system also helps in coordinating the activities of our body. The endocrine system in our body consists of a number of glands (or tissues) which make, store, and release chemicals called hormones.

   The working of endocrine glands is controlled by our nervous system. The hormones produced by endocrine glands act as messengers between the nervous system and the organs of our body.

4. Peripheral nervous system facilitates communication between central nervous system and the other parts of the body.
   Two types of nerves:

   Cranial nerves arise from the brain and spread throughout the head.

   Spinal nerves arise from the spinal cord along most of the length of the spinal cord and spread throughout the body except the head.

5. Reflex Arc. The path followed during a reflex action is called reflex arc. Diagram as given in textbook.

**IV. Answer the following questions. 5x5=25**

1. a) He is suffering from diabetes. Deficiency of insulin causes diabetes.

   b) Pancreas secretes insulin. Insulin helps in regulating blood sugar.

   c) When the sugar level in blood increases, it is detected by the a-cells of the pancreas which responds by producing more insulin. As the blood sugar level falls, insulin secretion is reduced.

2. (a) Brain is covered by a three-layered membrane called meninges. In between the layers of meninges and brain, cavity fluid named Cerebro Spinal Fluid (CSF) is filled. The hard skull covers the meninges. Thus Meninges, CSF and Skull protects our brain for a certain extent.

(b) Two main parts of hind-brain are — Medulla and Cerebellum. Their functions are:
**Medulla:** Involuntary actions such as blood pressure, salivation and vomiting.
**Cerebellum:** It is responsible for precision of voluntary actions and maintaining the posture and balance of the body.

3.

| **Nervous System** | **Endocrine System** |
|---|---|
| Formed from collection of neuron cells | Formed from set of glands |
| Electrochemical pulses are the mean of signal transmission | Hormones are the means of signal transmission |
| Use the neurons to transmit the signal | Use the circulatory system to transmit the signal |
| Signal transmission is fast | Signal transmission is slow |
| The cells are interconnected to form electrical pulses | The organs are not connected hence individual glands release individual chemicals(hormones) |

4. (a) Glucose is needed by cells for respiration. It is important that the concentration of glucose in the blood is maintained at a constant level. Insulin is a hormone produced by the a-cells that regulates glucose levels in the blood.

   In order for multicellular organisms to function properly, their cells must communicate. For instance, your muscles must contract when your brain sends a message to contract.

   Pancreas produces insulin and p-cells which increase glucose in blood. It also – produces digestive enzyme (pancreatic amylase).

   (b) Cell-to-cell signalling is a critical component of coordinating cellular activities. Through this communication, messages are carried from signalling cells to receiving cells, also known as target cells. This signalling occurs with proteins and other types of signalling molecules. Other things which happens in our body due to cell communication are – growth and development, cellular reproduction, tissue repair, sensing pain, etc.
5. (a) The two main constituents of the Central Nervous System in human beings are the brain and the spinal cord.

   (b) A living being does not live in isolation. It has to constantly interact with its external environment and has to respond properly for its survival. For example; when a hungry lion spots a deer, the lion has to quickly make a move so that it can have its food. On the

other hand, the deer needs to quickly make a move to run for its life. The responses which a living being makes in relation to external stimuli are controlled and coordinated by a system; especially in complex animals. So, control and coordination . is essential in maintaining a state of stability and a steady state between the internal conditions of an organism and the external environment.

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