

CONTROL AND CO-ORDINATION

WORKSHEET - 3

CLASS 10

1. **When light falls on a part of the plant, the plant appears to bend towards the light?**

Solution

When lights falls on a part of a plant, a hormones called auxins which is synthesized at the tipoff the shoots helps the cells to grow longer. As the light falls on one side of the plant this hormone auxin diffuses towards the side of the shoot which is not in sunlight and stimulates the cells to grow longer. Hence the plant appears to bend towards the light

2. **What is tropism? Write as note on different type of tropism.**

Solution:

A growth movement of a plant part in response to an external stimulus in which the direction of stimulus determines the direction of response is called tropism. Thus, tropism is a directional movement of the part of a plant caused by its growth.

Types of tropisms

1)Phototropism

The growth movement in plants in response to light stimulus is known as phototropism. For example, the flower head of a sunflower is positively phototropic as it moves from East to West, along with the movement of the Sun. The shoots show positive phototropism while the roots show negative phototropism.

2)Geotropism

The growth movement in plants in response to the force of gravity is known as geotropism.

In geotropism, the roots of the plant always grow downwards while the shoots always grow upwards, away from the earth.



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3)Chemotropism

The growth movement in plants in response to chemical stimuli is known as chemotropism.

For example, the growth of pollen tube towards the ovule in the ovary (through the stigma and style) is an example of positive chemotropism.

4)Hydrotropism

The growth movement in plants in response to water is known as hydrotropism.

For example, the roots of some plants grow towards the water source, even when the water source is not present directly below it.

5) Thigmotropism:

The directional growth movement of a plant part in response to the touch of an object is called thigmotropism. The climbing parts of the plant such as tendrils grow towards any support which they happen to touch and wind around that support. So Tendrils of plants are positively thigmotropic.

3. A potted plant, when kept near a lighted window shows growth in the direction of window in a few days?

Solution

The shoot system of the potted plant responds to the stimulus and grows in the direction of light. It shows the phototropic movement. Environmental triggers such as air, light or gravity will change the directions that plant parts grow in. Thus shoot respond by bending towards light i.e. positively phototropic and negatively Gravitropic.

4. Describe an experiment to show geotropism.

Solution

The movements of plant roots towards the earth and that of stem away from earth, both are cases of geotropism. Since the root grow down toward the pull of gravity, so the downward growth (or downward movement) of roots is called positive geotropism. The stem (or shoot) grows upwards, away from the pull of gravity, so the upward growth (or upward movement) of stem or shoot is called negative geotropism. The response of plant to gravity will become more clear from the following experiment.

- i) We take a potted plant growing in transparent glass jar. When this potted plant is kept in the normal position, we can see that its roots are growing downwards and its stem is growing upwards.
- ii) Let us now tilt the potted plant and keep the pot horizontally on its side as shown in figure. In this position, the roots and stem both are parallel to the ground (or earth). Allow the plant to remain in this position for a few days.
- iii) After a few days we will find that the roots of the potted plant bend downwards towards the earth and the stem of plants bends upwards, away from the earth. The roots of plant grow downwards in response to the pull of gravity. The stem of plants respond to gravity in the opposite way, by growing upwards (away from the pull of gravity).



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5. Write the function of plant hormones (Phytohormones).

Solution

Following are the function of plant hormones:

- 1) Germination of seeds (or Breaking the dormancy of seeds.)
- 2) Growth of root stem & leaves.
- 3) Movement of stomata (or stomatal movement) in leaves.

- 4) Flowering of plants.
- 5) Ripening of fruits.
- 6) Phototropism, geotropism, Chemotropism, hydrotropism, thigmotropism and nastic movement.

6. What are the different types of neurons?

Solution

Neurons are of three types: sensory neurons, motor neurons and relay neurons.

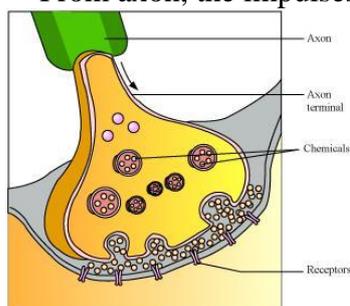
- i) Sensory neurons transmit impulse form the sensory cells towards the central nervous system (spinal cord and brain).
- ii) Motor neurons transmit impulses from the central nervous system (spinal cord and brain) towards the muscles cells (or effectors).
- iii) Relay neurons occur in the central nervous system (brain and spinal cord) where they serve as links between other neurons.

7. What happens at the synapse between two neurons?

Solution:

A very small gap that occurs between the last portion of axon of one neuron and the dendron of the other neuron is known as a synapse. It acts as a one way valve to transmit impulses in one direction only. This uni-direction transfer of impulses occurs as the chemicals are produced in only one side of the neuron i.e., the axon's side.

From axon, the impulses travel across the synapse to the dendron of the other neuron.



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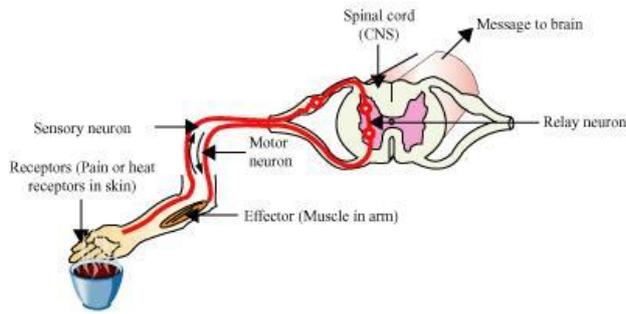
A synapse or neuromuscular junction

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

Solution

Reflex actions are sudden responses, which do not involve any thinking. For example, when we touch a hot object, we withdraw our hand immediately without thinking as thinking may take time which would be enough to get us burnt.

The sensory nerves that detect the heat are connected to the nerves that move the muscles of the hand. Such a connection of detecting the signal from the nerves (input) and responding to it quickly (output) is called a reflex arc. The reflex arcs –connections present between the input and output nerves – meet in a bundle in the spinal cord.



Reflex arc

Reflex arcs are formed in the spinal cord and the information (input) reaches the brain. The brain is only aware of the signal and the response that has taken place. However, the brain has no role to play in the creation of the response.

9. How does the brain control all activities? Solution:

The brain is the main coordinating centre of the body. It is a part of the nervous system, which controls and monitors every organ of the body.

The nervous system is divided into - central nervous system (CNS) and peripheral nervous system (PNS). The CNS consists of the brain and spinal chord while the PNS consists of the nerves that connect the central nervous system to different parts of the body.

The central nervous system receives information from all parts of the body and also sends information to the muscles. Communication between the CNS and body parts is facilitated by the nerves of PNS.

10. Insulin plays an important role in controlling the sugar level of blood?

Solution

The beta cells of islets of langerphans in pancrease secrete a hormones called insulin due to which the tissues (especially the liver tissues) utilise glucose and control blood glucose level. When the sugar level of the blood rises, it is detected by the cells of the pancrease which respond to the situation by producing more insulin. As the sugar level of the blood falls, the secretion of insulin is reduced. Thus, Insulin plays an important role In controlling the sugar level of blood.

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