Class 10th Science

Chapter - 7

Control and coordination

Textual Questions and Answers :

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Q.1. What is the difference between a reflex action and walking ?

Ans :- Reflex action is a spontaneous involuntary or automatic nerve mediated response to a stimulus produced at the unconscious level . But walking is the movements of muscles of legs controlled by brain .

Q.2. What happens at the synapse between two neurons .

Ans :- At synapse , information carrying neuron's axon end , electrical impulse sets off the release of some chemicals . These chemical cross the gap or synapse and reach to dendrites of the next neuron and start electrical impulse there.

Q.3. Which part of the brain maintains posture and equilibrium of body ?

Ans :- Cerebellum .

Q.4. How do we detect the smell of an agarbatti (incense sticks) ?

Ans :- Smell of an agarbatti is sensed by receptor in the nose and the information is transmitted to olfactory lobe located in the fore brain which interprets the information.

Q.5. What is the role of brain in reflex action ?

Ans :- Brain is the main co - ordinating centre of the body . The brain and spinal cord constitute the central nervous system . They receive information from all parts of the body and integrate it .

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Q.1. What are plant hormones ?

Ans :- These are chemical compounds secreted by plants which diffuse all around the other cells and regulate the activities . Plant hormones help to co - ordinate growth , development and responses to the environment .

Q.2. How is the movement of leaves of sensitive plant is different from movement of a short towards light ?

Ans :- Movement of leaves of the sensitive plant is not directional to the stimulus of touch . But the movement of shoot is directional towards light .

Movement of leaves of sensitive plant is due to change in the amount of water present in them . The movement of the shool towards light is due to growth controlled by growth hormone .

Q.3. Given an example of plant hormone that promotes growth .

Ans :- Auxin .

Q.4. How do auxins promote growth of a tendril around a support .

Ans :- Some plants like the pea plant climb up other plants or support by means of tendrils . These tendrils are sensitive to touch . When they come in contact with any support , the part of the tendril in contact with the object does not grow as rapidly as the port of the tendril away from the object . This causes the tendril to circle around the object and thus cling to it . It is due to accumulation of auxins .

Q.5.Design an experiment to demonstrate hydrotropism.

Ans :- Growth movements in response to the stimulus of moisture are termed as hydrotropic movements .

Place some ready to germinate seeds of pea in moist sawdust in a shallow box whose bottom has been replace by a wire gauze .

Keep the apparatus undisturbed for 2-3 days . keep the sawdust moist . After some time radicals will pass through the sieves . Then the radicles curve upwards again to enter into the moist sawdust . the roots are positively hydrotropic and the curvature is more than that due to entropic effect .

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Q.1. How does chemical coordination take place in animals ?

Ans :- It is brought about by chemical messengers called hormones . They are secreted by endocrine glands . The hormones are carried by the blood to the site of action . The hormones are consumed during their action . Hormones provide wide ranging changes .

Q.2. Why is the use of iodised salt advisable ?

Ans :- Iodine is necessary for the thyroid gland to make thyroxin hormone . Thyroxin regulates carbohydrate , protein and fat metabolism in the body so as to provide the best balance for growth . Iodine is essential for the synthesis of thyroxin . In case iodine is deficient in our diet , there is a possibility that we might suffer from goitre . So to avoid deficiency of iodine , iodised salt is recommended .

Q.3. How does our body respond when adrenaline is secreted into the blood ?

Ans :- Adrenaline is secreted from adrenal gland . Adrenaline is secreted directly into the blood and carried to different parts of the body . The target organs or the specific tissues on which it acts include the heart . As a result , the heart beat faster , resulting in supply of more oxygen to our muscles . The blood to the digestive system and skin is reduced due to contraction of muscles around small arteries in these organs . This diverts the blood to our skeletal muscles . The breathing rate also increases because of the contractions of the diaphragm and the rib muscles.

Q.4. What are some patients of diabetes treated by giving injections of insulin ?

Ans :- Insulin 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

Q.1. Which of the following is a plant hormone ?

(a) Insulin.

(b) Thyroxin.

(c) Oestrogen.

(d) Cytokinin.

Ans :- (d) Cytokinin.

Q.2. The gap between two neurons is called a

(a) Dendrite.

(b) Synapse.

(c) Axon.

(d) Impuls.

Ans . (b) Synapse.

Q.3. 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 .

Q.4. What is the function of receptors in our body ? Think of a situation where receptors do not work properly . What problems are likely to arise ?

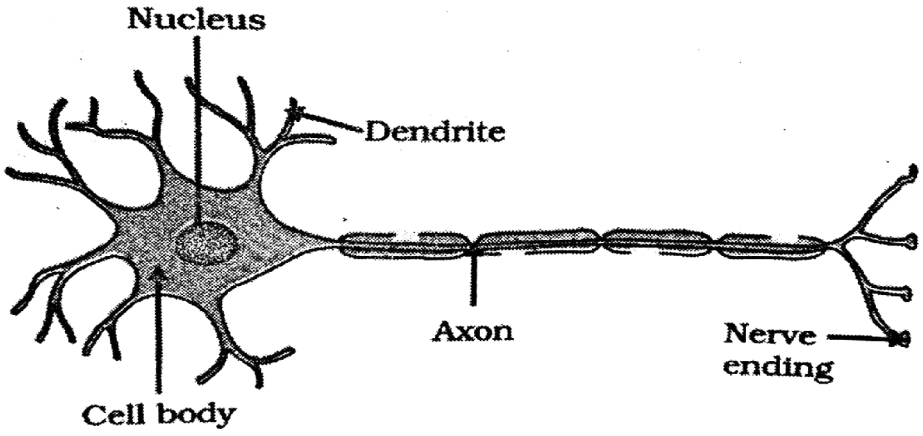
Ans :- Receptors are the specialised tips of some nerves. They are usually located in our sense organs like the nose the inner ear , the tongue etc.

The function of receptors is to detect information from the environment .

If receptors do not detect the information there will not be any co - ordination . It may lead to accidents . Body response will not be there .

Q.5. Draw a structure of a neuron and explain its function :

Ans :- Structure of neuron :



Function :-

(i) Dendrites of a neuron collect information from the receptor.

(ii) Axon conducts information as electrical impulse .

(iii) Terminal arborization pass the information as chemical stimulus at synapse for on ward transmission .

Q.6. How does phototropism occur in plants ?

Ans :- Environmental triggers such as light , or gravity will change the directions that plant parts grow in . These directional or tropic movements can be either towards the stimulus , or away from it , so , in two different kinds of phototropic movement , shoots respond by bending towards light while roots respond by bending away from it .

Q.7. Which signals will get disrupted in case of a spinal cord injury ?

Ans :- Reflex action will be disturbed because reflex arcs are located in the spinal cord . So , the quick responses needed to safe guard the body will not take place . The delayed responses may cause harm to the body.

Impulses from various body parts will not be communicated to brain . Messages from brain to body parts will not be communicated .

Q.8. How does chemical coordination occur in plants ?

Ans :- Plants lack well organised control mechanism as in animals . However plants respond to light , touch and gravitational force .

Moreover growth and movements in plants are regulated by external and internal factors .

Plant growth regulators or phytohormones are the chemical occuring in minute quantities and responsible for regulating metabolism , growth and development .

The important phyto hormones are auxin , gibberellins , cytokinins , ethylene and abscisic acid . All growth processes are regulated by one or more phytohormones acting synergistically or antagonistically .

Q.9. What is the need for a system of control and co che ordination in an organism ?

Ans :- Control and co - ordination system makes the various body organs and organs systems to work in organised pattern and in a coordinated way .

Control and co - ordination also aids in maintaining a steady stage between the internal environment of an organism and the external environment .

Q.10. How are involuntary actions and reflex actions different from each other ?

Ans :- Reflex actions are the spontaneous responses by voluntary organs but involuntary actions are by the involuntary organs .

Q.11. Compare and contrast the nervous and hormonal mechanism for control and coordination in animals .

Ans :-

Nervous system	Hormonal system
(i) The nervous system controls the various functions by the units called neurons.	(i) Hormones are chemical messengers secreted by endocrine glands.
(ii) Nervous system has a network of nerves spread through out the body.	(ii) Hormonal system does not has such a network.
(iii) The nervous system gets information from our sense organs and act throughout muscles to meet out.	(iii) Hormones help in growth and development of the body controlling body metabolism , development secondary characters etc.

Q.12. What is the difference between the manner in which movement takes place in a sensitive plant and the First movement in our legs ?

Ans :- The movement in sensitive plant leaves takes place in response to touch stimulus . When terminal pinnule is touched , the stimulus is conducted to its base and the pinnules droop sown . This happens in change in osmotic pressure causing shrinkage . When the stimulus time is over , osmotic pressure increases and the cells swell , the ipenneels become normal .

Our legs are provided with nerves which have connection with muscles . To lift the leg , the brain passes information to nerves .

Additional Questions and Answers :

Q.1. Define tropic movements .

Ans :- The movements of plant which are directional , either towards the stimulus or away from it are called tropic movements .

Q.2. What is phototropism ?

Ans :- Bending of plant towards the light is called phototropism .

Q.3. What is geotropism ?

Ans :- Downward movement of a plant in response to gravitational force is called geotropism .

Q.4. What is chemotropism ?

Ans :- The movement due to chemical stimulus as seen during the pollen tube growth is called chemotropism .

Q.5. Define photoperiodism .

Ans :- Flowering and seed germination in plants are regulated by a process called phto periodism .

Q.6. What is phytochrome ?

Ans :- Plants respond to photoperiodic stimulus by a specialized pigment called phytochrome .

Q.7. What is reflex action ?

Ans :- Reflex action is a spontaneous involuntary or automatic nerve mediated response to a stimulus produced at the unconscious level . Several of our activities are governed by reflex action .

Q.8. What happens when bright light is focussed one eyes ?

Ans :- Eyes get closed in response to light so as to protect the eyes .

Q.9. Give two example of reflex action .

Ans :- (i) Closing of eyes in response to bright light .

(ii) Withdrawal of hand in case you touch a hot plate .

Q.10. What are the three basic region of brain ?

Ans :- (i) Fore brain.

(ii) Mid brain.

(iii) Hind brain.

Q.11. Name two types of gland present in our body .

Ans :- Exocrine gland and endocrine gland .

Q.12. What is the other name of hormone ?

Ans :- Chemical coordinators .

Q.13. Name the hormone secreted by thyroid gland .

Ans :- Thyroxine .

Q.14. Write the function of hormone ' Thyroxin ' in our body .

Ans :- It regulates metabolism of carbohydrates , fats and proteins .

Q.15. What is the role of dendrites ?

Ans :- the role of dendrites is to carry nerve impulse towards the cell body of a neuron . It receive information from axon of other neuron through synapsis .

Q.16. Explain the movement in leaves of the sensitive plant on touching.

Ans :- When a sensitive plant is touched , the movement happens at a point different form the point of touch . The information of touch is communicated by the use of electrical - chemical means to convey this information

from cell to cell . But plants do not have specialized tissues for conduction of information .

In response to stimulus touch , the cells of sensitive plant cells change shape by changing the amount of water in them , resulting in swelling or shrinking and therefore in changing shapes .

When the plant is touched , the cells of leaves water and shrink . So , the leaflets droop . When the effect of the stimulus of touch is over . The cells become swollen due to entry of water and leaflets become normal .

Q.17. What are the functions of spinal cord ?

Ans :- (i) It acts as modulator.

(ii) It controls all the reflex actions .

(iii) It reduces all burden of brain .

Q.18. What are the general functions of ' hormones ' ?

Ans :- (i) Hormones stimulate the tissue activity .

(ii) Hormones regulate growth and reproduction .

(iii) Hormones control metabolism .

(iv) Hormones conserve water and minerals .

Q.19. Name the hormones secreted by thyroid , para thyroid and pancreas .

Ans :- Thyroid – Thyroxine .

Parathyroid – Calcitonin and Para thromone.

Pancreas – Insulin and Glucagon .

Q.20. Differentiate between estrogen and testosterone .

Ans :- Estrogen is a female hormone and is secreted by the ovary . It causes development of secondary female sex fetures such as development of breasts .

Testosterone is a male hormone and is secreted by the testis . It cause development of secondary male features such as the growth of moustache and beard .

Q.21. What cause goitre ? Mention one of the symptoms?

Ans :- Goitre is caused by iron deficiency in the diet - Iodine is essential for the synthesis of thyroxin hormone.

Symptom :- One of the symptom of goitre is swollen neck .

Q.22. Fill in the blanks :

(i) Germination of seed and pushing of soil by seeding is an example of movement caused by ----------.

(ii) The receptors are usually located in our sense organs such as the ---------- the ---------.

(iii) At the end of the axon the electrical impulse set off the release of some ----------.

(iv) The nervous tissue is made of an organised network of --------- or ----------.

(v) The central nervous system consists of ---------- and----------.

(vi) The ---------- is the main thinking part of the brain.

(vii) In some plants tendrils are sensitive to ----------.

(viii) Adrenaline is secreted by ---------- gland .

(ix) Reflex arcs are more ---------- for quick response .

(x) Control and coordination are the function of the nervous system and ---------- in our body .

Ans :- (i) Growth.

(ii) Internal ear , nose , tongue.

(iii) Chemicals.

(iv) Nerve cell , neurons.

(v) Brain , spinal cord .

(vi) Fore brain.

(vii) Touch.

(viii) Adrenal.

(ix) Efficient.

(x) Hormones.

Q.23. What will happen if thyroxine become excess ?

Ans :- When the amount of thyroxin is increased , it results in exophthalmic goitre . In this , the thyroid gland gets enlarged considerably and produces a big swelling in the neck regin and causes bulging of eyes . Excessive heat , reduced body weight , high blood pressure are the other symptoms .

Q.24. Name the parts of the body which sends instructions to the muscles and glands .

Ans :- Brain and spinal cord .

Q.25. What is the main function of cerebrum ?

Ans :- Thinking and coordination .

Q.26. Cytokinins promote cell division in human true or false .

Ans :- False .

Q.27. Write the functions of abscisic acid .

Ans :- (i) Abscisic acid is a growth regulator found widespread in plants .

(ii) Abscisic acid causes the inhibition of mitosis in the vascular cambium .

(iii) Abscisic acid brings about the seasonal leaf fall .

Q.28. Write short note on movements in plants .

Ans :- The movement of a plant or its part in direction of stimulus is known as tropism . Curvature movements in flowering plants are of two types : - growth movements and turgor movements .

Growth movements are caused due to differential or unequal growth of an organ . They are slow and can be observed through time - lapse photography .

Q.29. Which parts of the plant body produce growth regulators ?

Ans :- Growing tips .

Q.30. Differentiate between hormones and enzymes .

Ans :-

Hormones	Enzymes
(i) They are produced by ductless glands .	(i) They are produce by glands which have ducts .
(ii) Hormones may be other than proteins .	(ii) These are always protenic in nature .
(iii) They are specific chemical messengers which act on specific tissue or organ .	(iii) They biocatalysts which regulate the rate of biochemical reaction .

Multiples Choice Questions :

Q.1. Which one of the following endocrine glands produces two distinct hormones ?

(a) Adrenal.

(b) Thymustert.

(c) Testis.

(d) Pineal.

Ans :- (a) Adrenal.

Q.2. Brain and spinal cord act as

(a) Receptors.

(b) Effectors.

(c) Modulators.

(d) None of these.

Ans :- (c) Modulators .

Q.3. Autonomous nervous system does not control .

(a) Thinking and learning.

(b) Heart beat.

(c) Excretion.

(d) Reflex.

Ans :- (a) Thinking and learning .

Q.4. Movement in the leaf of the touch - me - not plant is:

(a) Epinasty.

(b) Hyponosty.

(c) Nyctinasty.

(d) Seismonasty.

Ans :- (d) Seismonesty .

Q.5. Which one of the following is not endocrine glands?

(a) Pituitary.

(b) Thyroid.

(c) Adrenal.

(d) Salivary.

Ans :- (d) Salivary .

Q.6. Hormone is

(a) Enzymatic product.

(b) V Chemical messenger.

(c) Nerve impulse.

(d) Excretory product.

Ans :- (b) Chemical messenger .

Q.7. Glucose level of blood is regulated by

(a) Thyroxin and calcium.

(b) Insulin and glucagon.

(c) Insulin and thyroxin.

(d) Glucagon and thyroxine.

Ans :- (b) Insulin and glucagon .

Q.8. Blood pressure is controlled by

(a) Adrenal gland.

(b) Thyroid.

(c) Thymus.

(d) Pancreas.

Ans :- (a) Adrenal gland .

Q.9. Growth hormone is produced in

(a) Thyroid.

(b) Adrenal.

(c) Gonads.

(d) Pituitary.

Ans :- (d) Pituitary.

Q.10. Male hormone is

(a) Entrogen.

(b) Testosterone.

(c) Adrenalin.

(d) FSH.

Ans :- (b) Testosterone .

Q.11. Spinal cord originates from :

(a) Cerebrum.

(b) Medulla.

(c) Pons.

(d) Cerebellum.

Ans :- (b) Medulla.

Q.12. Select the mis - matched pair :

(a) Adrenaline : Pituitary gland.

(b) Testosterone : Testes.

(c) Estrogen : ovary.

(d) Thyroxine : Thyroid gland.

Ans :- (a) Adrenaline : pituitary gland.

Q.13. Which of the following is not an involuntary action?

(a) Vomiting.

(b) Salivation.

(c) Heart beat.

(d) Chequing.

Ans :- (d) Cheung.

Q.14. Which of the following endocrine glands is unpaired ?

(a) Adrenal.

(b) Testes.

(c) Pituitary.

(d) Ovary.

Ans :- (c) Pituitary.

Q.15. The substance which accelerates the growth in stem is

(a) Vitamin.

(b) Enzyme.

(c) Auxin.

(d) Chlorophyll.

Ans :- (c) Auxin.

Q 16. Auxins are

(a) Hormones.

(b) Proteins.

(c) Fats.

(d) Cell organelles.

Ans :- (a) Hormones .

Q. 17. Which of the following does not secrete any hormone ?

(a) Testis.

(b) Spleen.

(d) Pancreas.

Ans :- (b) Spleen.

Q.18. Which plant hormone causes bending of shoot towards light ?

(a) Auxin.

(b) Gibberellin.

(c) Cytokinin.

(d) Ethylene.

Ans :- (a) Auxin.

Q.19. The growth of pollen tubes towards ovules is the example of

(a) Hydrotropism.

(b) Geotropism.

(c) Chemotropism.

(d) Phototropism

Ans :- (c) Chemotropism .

Q.20. Which of the following is a plant hormone ?

(a) Thyroxine.

(b) Insuline.

(c) Oestrogen.

(d) Cytokinin.

Ans :- (d) Cytokinin.