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Solution 32

(a) There are 5 sense organs: Eyes, ears, nose, tongue and skin.

(b) A receptor is a cell (or a group of cells) in a sense organ which is sensitive to a particular type of stimulus (or a particular type of change in the environment).

Example: Photoreceptors and Phonoreceptors.An effecter is the part of the body which can respond to the stimulus according to the instructions sent from the nervous system (spinal cord and brain).

Example: Muscles and glands.

Solution 33

(a) Spinal cord is a cylindrical structure which begins in continuation with medulla and extends downwards. Its function is the conduction of nerve impulses to and from the brain and it is concerned with spinal reflex actions.

(b) The medulla controls various involuntary actions such as heart beat, breathing, blood pressure and peristaltic movements of the elementary canal.

It is also the controlling centre for reflexes such a swallowing, coughing, sneezing, secretion of saliva and vomiting.

Solution 34

(a) The three types of nerves which make up the peripheral nervous system are: spinal nerves, cranial nerves and visceral nerves.

(b)

Reflex action	Walking
It is a rapid, automatic response to a stimulus which is not under the voluntary control of the brain. It is a kind of involuntary action which involves the spinal cord. It is not based on our thinking.	It is a voluntary action which we undertake knowingly. The action of walking involves thinking by the brain. The central nervous system (brain, spinal cord) takes part in the action of walking.

(c) When the agarbatti burns, it produces vapours having a characteristic pleasant smell which is detected by the olfactory receptors present inside our nose. The action of smell of agarbatti or receptors sets off chemical reactions which generate electrical impulses. The sensory neurons carry these electric al impulses to the sensory area of fore brain called cerebrum. This makes us detect the smell of burning agarbatti.

Solution 35

(a) Hormones are made by endocrine glands.

(b) Receptors are the special cells present in our sense organs which detect all the information from our environment and feed it to the nervous system. An effector responds to electrical impulses sent from the nervous system through motor nerves.

Solution 36

(a) (i) Thyroxine

(ii) Parathromone

(iii) Insulin

(iv) Adrenaline.

(b) The function of testosterone hormone is to control the

development of male sex organs and male features such as deeper voice, moustache, body hairs etc. The function of oestrogen is to control the development of female sex organs and female features such as feminine voice, soft skin and mammary glands.

Solution 37

(a) Hindbrain has 3 regions:

(i) Pons: It takes part in regulating respiration.

(ii) Cerebellum: It helps in maintaining posture and balance of the body. It enables us to make precise and accurate movements.

(iii) Medulla: The medulla controls various involuntary actions such as heart beat, breathing, blood pressure and peristaltic movements of the elementary canal. It is also the controlling centre for reflexes such a swallowing, coughing, sneezing, secretion of saliva and vomiting.

(b) Function of cerebrum: It is the main thinking part of the brain. It is the site of our faculties such as learning, reasoning, intelligence, personality and memory. All our thoughts, sensation, actions and movements are controlled by cerebrum.

Solution 38

(a) The 3 regions of human brain are

(i) Forebrain

(ii) Midbrain and

(iii) Hindbrain.

(b) Cranium is a bony box in the skull in which the brain is present. Its function is to protect the brain.

Solution 39

(a) The chemical coordination in animals takes place through the actions of chemicals called hormones which are release directly into the blood and are carried by the blood circulatory system to other parts of the body. Hormones travel all over the body but affect only particular organs at particular places which are called target organs. The organs control and coordinate several functions of animal body such as growth, development, metabolism, behavior and secondary sexual characteristics, etc.

(b) Iodine is necessary for the thyroid gland to make thyroxine hormone which regulates the metabolism of carbohydrates, fats and proteins so as to produce the best balance for the growth. Iodised salt is advisable as it contains appropriate amounts of iodine compounds needed by the thyroid gland to make sufficient thyroxine hormone for the body and hence goitre disease can be prevented.

Solution 40

The function of insulin hormone is to lower the blood sugar level (or blood glucose level). People having severe diabetes are treated by giving injections of insulin.

Solution 41

Nervous System

It is a system to coordinate the activities of bodies. It helps all other system of our body to work together. It receives information from the surroundings, processes it, interprets it and then responds accordingly.

Endocrine System

It is a group of endocrine glands which produces various hormones that helps in coordinating the activities of our body. The hormones produced by the endocrine glands act as messengers between the nervous system and the organs of our body.

Solution 42

(a) Thyroxine: The function of this hormone is to control the rate of metabolism of carbohydrates, fats and proteins in the body.

(b) Adrenaline: Its function is to regulate heart rate, breathing rate, blood pressure and carbohydrate metabolism.

(c) Growth hormone: It controls the growth of the human body.

Solution 43

The endocrine gland present in the human body are:

(i) Pineal gland

(ii) Hypothalamus
(iii) Pituitary
(iv) Thyroid
(v) Parathyroid
(vi) Thymus
(vii) Pancreas
(viii) Adrenal glands
(ix) Testes (in males)
(x) Ovaries (in females). Pancreas, testes and ovaries function as exocrine glands.

Solution 44

(i) d
(ii) c
(iii) e
(iv) a
(v) b

Solution 45

It is an example of reflex action. The stimulus here is drawing pin lying on the floor. The pain is sensed by the receptors in the skin which triggers and impulse in a sensory neuron and transmits the message to the spinal cord. The impulse is passed onto a relay neuron, which in turn, passes it to the motor neuron. The motor neuron passes the impulse to a muscle in the feet. The muscle then contracts and pulls our feet away from the drawing pin.

Solution 46

Puberty and adolescence are the results of sex glands in human beings. In males, testes make male sex hormones called testosterone which is associated with male puberty, which the boys attain an age of 13-14 years. In females the oestrogen hormone is responsible for all the changes associated with female puberty which the girl attains at an age of 10-12 years.

Solution 47

Neurons and other cells have a cell membrane, cytoplasm and a nucleus.

Solution 48

(a) Receptor

A receptor is a cell (or a group of cells) in a sense organ which is sensitive to a particular type of stimulus (or a particular type of change in the environment).

Example: Photoreceptors and Phonoreceptors.

Effector

An effector is the part of the body which can respond to the stimulus according to the instructions sent from the nervous system (spinal cord and brain).

Example: Muscles and glands.

(b) Cerebrum

(i) It is a part of forebrain.
(ii) It is the main thinking part of the brain. All our thoughts, sensation, actions and movements are controlled by cerebrum.

Cerebellum

(i) It is a part of hindbrain.
(ii) It helps in maintaining posture and balance of the body. It enables us to make precise and accurate movements.

Solution 49

Voluntary Action	Involuntary Action
Those actions which need thinking and are performed by us knowingly are called voluntary actions. Example: Writing, dancing.	Those actions which do not need thinking and are not performed by us knowingly are called involuntary actions. Example: Digestion, respiration.

Digestion is an involuntary action as it does not involve the thinking process and is performed unknowingly by our digestive system.

Solution 50

(i) CNS - Central nervous system.
(ii) (a) Cerebrum
(b) Spinal cord.
Solution 51
(a) Adrenaline.
(b) Insulin.
(c) Testosterone.
(d) Oestrogen.
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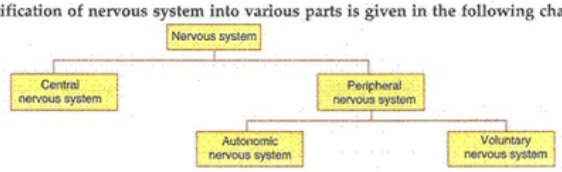
Solution 52
(a) Stimulus.
(b) Receptors (Olfactory).
(c) Effector (Salivary glands).
Solution 53
(a) Te structural and functional unit of nervous system is neuron.
(b)

The classification of nervous system into various parts is given in the following chart :



(c) Autonomic nervous system means self governing nervous system. Its function is to control and regulate the functions of the internal organs of our body involuntarily.
(d) The voluntary nervous system is a system which helps us to take voluntary actions which are under the conscious control of the brain. Example: If a student is getting late for school and sees his watch. He starts walking fast. In this process, the eyes see the time and send the information to the brain through the sensory nerves. The brain analyses the information and sends the instructions to walk faster to the muscle of our legs through the motor nerves. The muscles of the legs act accordingly and make the student walk faster.
Solution 54
(a) The rapid, automatic response to a stimulus which is not under the voluntary action of the brain is called reflex action.Example: Moving our hand away on touching a hot plate.

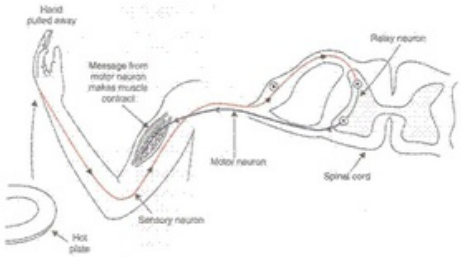
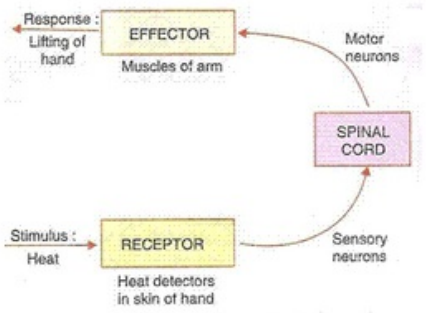


Diagram to show the reflex action and its path (which is called reflex arc).

(b) The pathway taken by the nerve impulses in our reflex action is called the reflex arc.



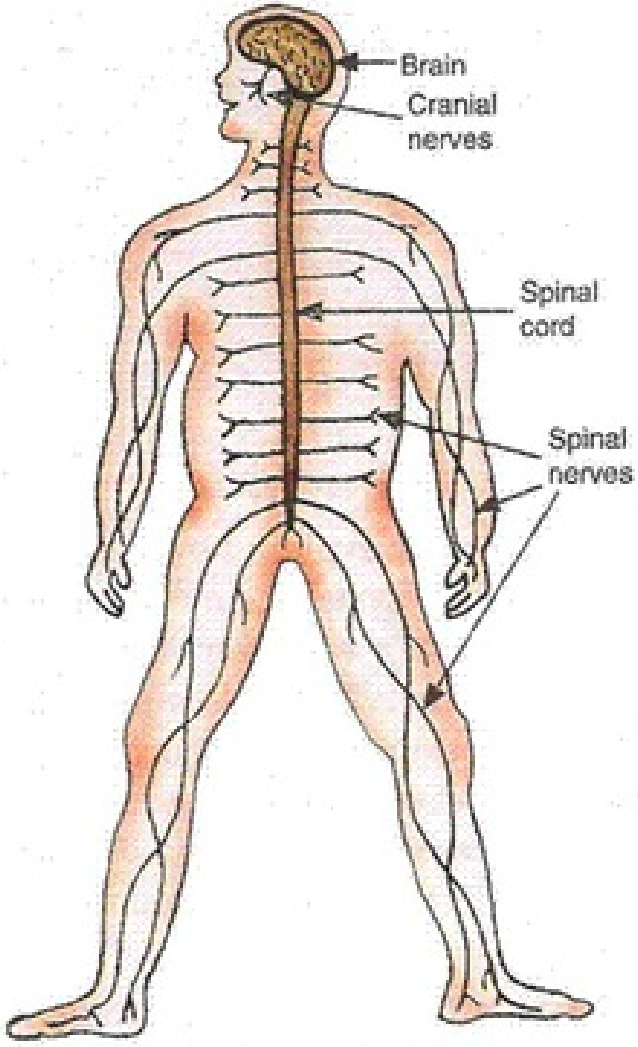
A reflex arc (This is actually a spinal reflex arc).

(c)

Reflex action	Involuntary Action
It is a rapid, automatic response to a stimulus which is not under the voluntary control of the brain. Example: Sneezing, coughing.	Those actions which do not need thinking and are not performed by us knowingly are called involuntary actions. Example: Digestion, respiration.

Solution 55

(a) (i) The function of the nervous system is to coordinate the activities of our body. (ii) It helps all other systems of our body to work together. (iii) It receives information from the surroundings, processes it, interprets it and then responds accordingly. (b) The main organs of the nervous system are; brain, spinal cord and nerves.

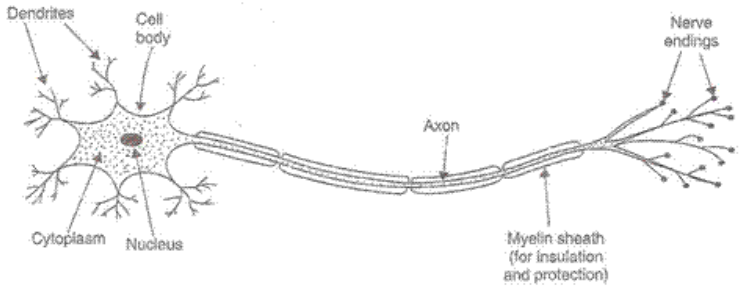


The human nervous system.

(c) When the sense organ in our body is affected, it sends the message to the brain in the form of electrical impulses through the sensory neurons. The brain analyses this message and decides the action to be taken. The brain then sends out instructions to the muscles of the concerned body parts through motor nerves and the concerned body part acts accordingly.

Solution 56

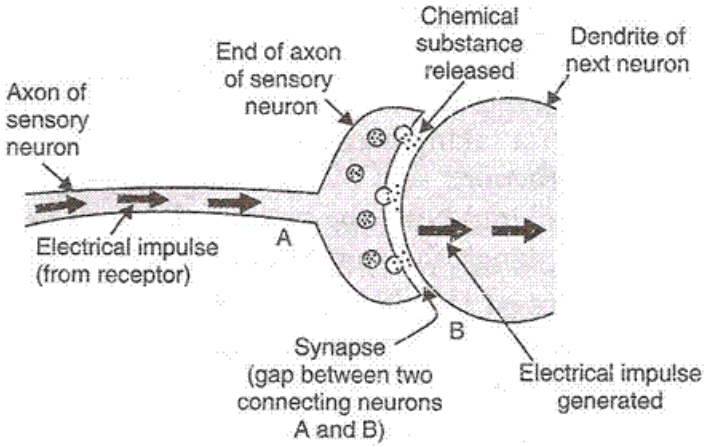
(a) The unit which makes up the nervous system is called a neuron.



A neuron (or nerve cell).

(b) 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. Synapse between two neurons acts as a one way valve which allows electrical impulses to pass in one direction only. This happens as follows: When an electrical impulse coming from the receptor reaches the end of the axon of sensory neuron, then the electrical impulse releases tiny amount of a chemical substance called neuro transmitter substance into the synapse

between two adjacent neurons. This substance crosses the synapse and starts a similar electrical impulse in the dendrite of the next neuron. In this way, the electrical impulses passes from one neuron to the next across the synapse.



Solution 57
(a) Nervous system and endocrine system.
(b) The central nervous system consists of the brain and spinal cord. The work of the CNS is to direct incoming messages to the motor neurons that are connected to the part of the body which will respond to a stimulus. It is involved in complicated responses where both (brain and spinal cord) work. It enables a person to give a more appropriate and more intelligent response to various situations.
(c) (i) The brain receives information carrying nerve impulses from all the sensory organs of the body.
(ii) It responds to the impulses brought in by sensory organs by sending its own instructions through motor nerves to the muscles and glands causing them to function accordingly.
(iii) It correlates the various stimuli from different sense organs and produces the most appropriate and intelligent response.
(iv) It coordinates the body activities so that the mechanisms and chemical reactions of the body work together efficiently.
(v) It stores information so that behavior can be modified according to the past experience.
Solution 58
(a)
(i) Pituitary - Growth.
(ii) Thyroid - Thyroxine.
(iii) Pancreas - Insulin.
(iv) Adrenal - Adrenaline.
(v) Testes - Testosterone.
(b) The endocrine glands do not have ducts to secrete their hormones. They release hormones directly into the blood of a person and reach the concerned body part through the blood and act on it.
(c) Hypothalamus.
(d) The adrenaline hormone prepares our body to function at maximum efficiency during emergency situations like danger, anger etc. This adrenaline hormone increases our heartbeat, breathing rate, blood flow into muscles and causes liver to put more stored glucose into our blood. All these actions produce a lot of energy in our body and help us to cope up the emergency situations. Thus, when adrenaline is secreted in large amounts it prepares our body for action. (e) Goitre - The neck of the person appears to be swollen due to the enlargement of thyroid gland located in the neck.

********** END **********