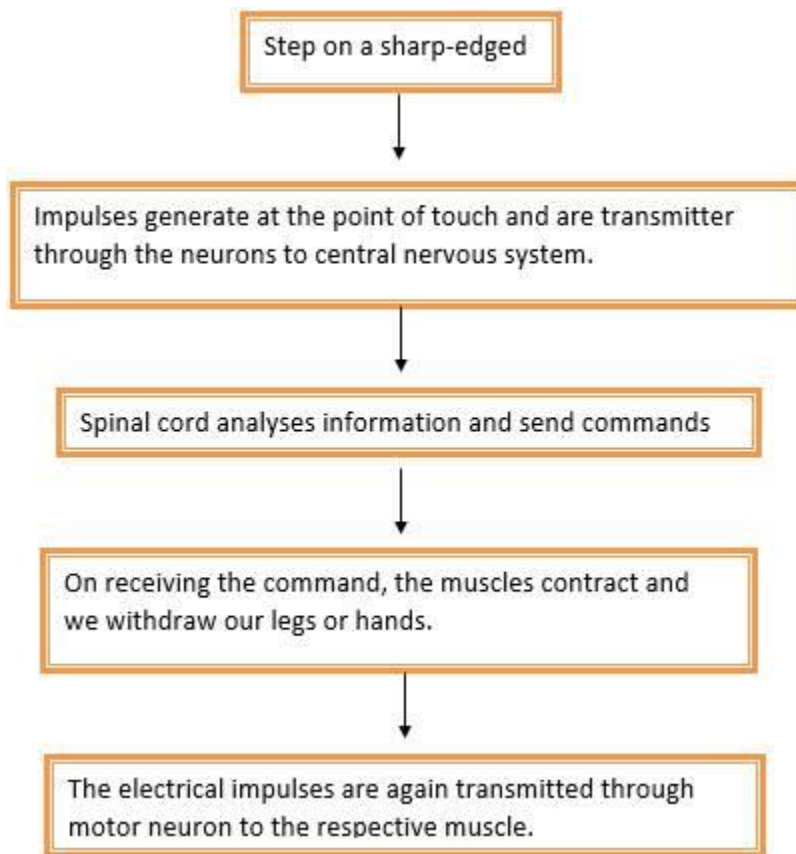


Coordination

Improve your learning

Q. 1. Fill in the missing sections in the following flow chart. (AS1)

Answer :



Q. 2. Do you think body's team work maintains the functioning of our body? Justify your answer with an example. (AS1)

Answer : The human body has several organs. These organs cannot perform their functions independently. So each organ depends on other organs. In order to maintain normal physiology, functions of these organs must be coordinated so that they can work in proper manner. Coordination is the process through which two or more organs interact and complement the functions of each other. Integration is the process which makes two or more organs to work as a functional unit in harmony. The neural system involves control and Coordination of various body functions through neurons.

For example, the neural system and the endocrine system jointly coordinate and integrate functions of various body parts to maintain normal physiology. The neural system provides an organized network of nerve fibers which connect various organs for quick neural coordination. The endocrine system provides chemical integration through hormones.

Q. 3. Give an example of coordination in your body where both hormonal and nervous control function together. (AS1)

Answer : The best example of coordination in our body where both hormonal & nervous control function together can be noticed in the functioning of adrenal glands. The adrenal glands are known as glands of emergency. They have paired structures located on the top of the kidneys. Each adrenal gland has two parts: adrenal cortex & adrenal medulla. Adrenal medulla & sympathetic nervous system function as an integrated system called sympathetic-adrenal system. The adrenal medulla secretes adrenaline & noradrenaline. Adrenaline is secreted at the time of emergency. Adrenaline has a great effect on cardiac activity. Stimulation of sympathetic nerves to adrenal medulla causes large quantities of adrenaline and noradrenaline to be released into the blood circulation. Both the hormones and sympathetic nervous system act on the same organs & produce similar effects on them like accelerates heart beat, raises blood pressure, slows peristalsis, etc. Adrenaline hormone is responsible for "fight or flight response".

Q. 4. Consider that you are passing by a garbage disposal area and you immediately cover your nose. Arrange the events below in a logical order by marking them from 1 to 5 to trace the events that happen in the nervous system from detection of foul smell (stimulus generation) to covering your nose (response). (AS1)

- A. At the end of the axon, electrical impulse releases chemicals**
- B. Stimulus received by the dendrites of a neuron sets off a chemical reaction that creates an electrical impulse.**
- C. Electrical impulse transmitted through cell body and axon**
- D. The chemicals cross the synapse and reach the next neuron. Similarly, the electrical impulse crosses several neurons**
- E. Finally, the impulse is delivered from neuron to the gland that helps in recognition of the foul smell and muscle cells that help in covering the nose**

Answer : 1- (B) B. Stimulus received by the dendrites of a neuron sets off a chemical reaction that creates an electrical impulse.

2 - C. Electrical impulse transmitted through cell body and axon

3. A. At the end of the axon, electrical impulse releases chemicals

4. D. The chemicals cross the synapse and reach the next neuron. Similarly, the electrical impulse crosses several neurons

5. E. Finally, the impulse is delivered from neuron to the gland that helps in recognition of the foul smell and muscle cells that help in covering the nose

Q. 5. What is a synapse? How is it useful in transfer information? (AS1)

Answer : Axon is a single, usually very long process of uniform thickness. The most sensitive part of the neuron is axon hillock. The axon contains neurofibrils & microtubules but does not have Nissl's granules, Golgi complex, ribosomes, pigment granules, fat globules, etc. The axon ends in a group of branches, the terminal arborizations. When the terminal arborizations of the axon meet the dendrites of another neuron to form a synapse they form synaptic knobs. The synaptic knobs contain mitochondria and secretory vesicles.

Synapse is the point of contact between the terminal branches of the axon of a neuron with the dendrites of another neuron separated by a fine gap. Here, the nerve impulse jumps into the next neuron. This is a chemical process. As the impulse, reaches the terminal end of an axon, a chemical acetylcholine is released. This chemical sets a new impulse in the dendrites of another neuron. The chemical is soon broken down by enzymes to make the synapse ready for the next transmission.

Q. 6 A. Distinguish between (AS1)

Stimulus and Response

Answer :

Stimulus	Response
a) It comprises of actions that cause a reaction. All living organisms respond to stimuli.	a) It comprises of the reactions observed after an action is performed.
b) For example, light is a stimulus received by plants.	b) For example. on receiving light plants show phototropism that is bent towards the light.

Q. 6 B. Distinguish between (AS1)

Afferent and Efferent nerves

Answer :

Afferent nerves	Efferent nerves
a) They conduct impulses from the receptors to the central nervous system.	a) They conduct impulses from central nervous system to the effectors.
b) The terminals of dendrons/dendrites become modified to form receptors.	b) The axon terminals come in contact with the motor end plate to form a neuromotor junction.
c) They are sensory in nature.	c) They are motor in nature.

Q. 6 C. Distinguish between (AS1)

Central nervous system and peripheral nervous system

Answer :

Central nervous system	Peripheral nervous system
a) It is hollow, dorsally placed structure lying along the middorsal axis of the body.	a) The nerves arising from the central nervous system constitute the peripheral neural system.
b) It comprises the brain and spinal cord. The brain is lodged in the skull while spinal cord is enclosed by the vertebral column.	b) The nerves originate from the brain and spinal cord and are known as cranial and spinal nerves respectively.

Q. 6 D. Distinguish between (AS1)

Receptor and effector

Answer :

Receptor	Effector
a) Group of cells which receive stimuli are called receptor cells. They have the ability to generate electrical impulses from the stimulus. On receiving the stimulus receptors get activated and transport a signal to the central nervous system along neurons.	a) The nerve impulses generated by receptor cells are carried along neurons to the target cells called effector. The nerve impulses cause the target cells or muscles to contract.
b) They include neurons.	b) They include muscles or glands.

Q. 7. How does Phototropism occur in plants? (AS1)

Answer : Plants show variable response related to developmental, physiological and growth. They respond to a particular wavelength of light. A plant shows directional growth in response to light. In general, shoot moves towards the light and roots move away from it. Plants actively show a response to light maybe to specific wavelengths which allow them to adjust and adapt to their surrounding environment and optimize growth. For example, some type of seeds only grows and germinate when they receive light. There are some plants which grow in the shade of neighbouring plants, they can increase their growth rate to get more sunlight. This shows that plants have an ability to detect or sense light. Special molecules called photoreceptor help the plant in sensing light. The photoreceptor is made up of a special protein which is linked to chromophore (light absorbing pigment). Phototropism is of two types: negative phototropism and positive phototropism. Shoots which grow towards light show positive phototropism while roots growing away from light show negative phototropism.

Q. 8. Give an example and explain how plants may immediately respond to a stimulus. (AS1)

Answer : An example to show that plants immediately respond to a stimulus is *Mimosa pudica*. It is a very sensitive plant. The leaf of *Mimosa* has 15-20 pairs of small leaflets along each midrib. As the leaf receives a stimulus such as a touch or wind, etc, it folds in & the stem droops. It is due to change in the turgor pressure at the point of touch. Turgor pressure is a hydrostatic pressure which develops due to the osmotic entry of solvent into it. *Mimosa pudica* shows seismonasty. Turgor pressure changes in the cells of their pulvini. Regular turgor changes in the leaflet bases cause rhythmic autonomic movement. In case of loss of turgidity, the shoots droop and the leaves show wilting. In wilting, the individual cells of leaves become flaccid due to loss of water from their interior.

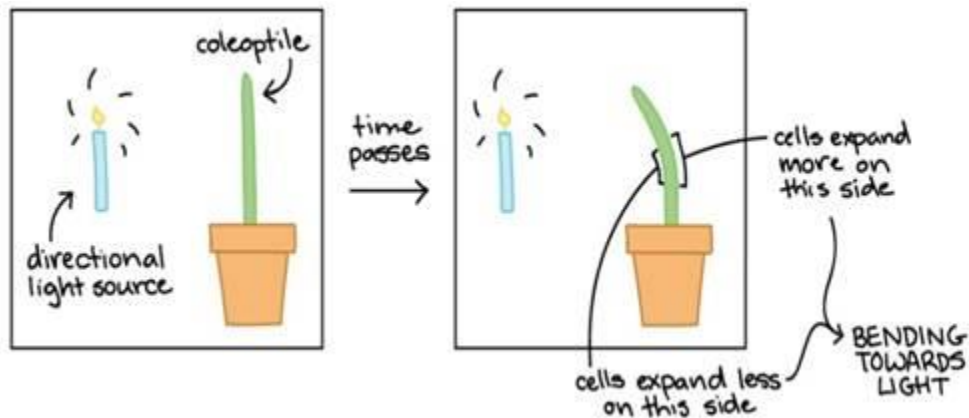
Q. 9. Suggest an experiment to show how roots grow away from light in most plants. (AS1)

Answer : Plants actively show a response to light maybe to specific wavelengths which allows them to adjust and adapt to their surrounding environment and accelerate their growth. Plants have the ability to sense or detect light. Special molecules called photoreceptors help the plant in sensing light. The photoreceptors are made up of a special protein which is linked to chromophore (light absorbing pigment). The main photoreceptor is phototropin.

To observe phototropism, perform the following simple experiment.

Take two small potted plants. Place one plant near the window and the other one cover the base of the plant tightly and hang the part upside down. Observe the plant for 1-2 weeks. You will observe that the plant placed near the window bends towards the direction of incoming light. The growth of plant parts towards light is called as positive

phototropism. Whereas in the other plant you will observe that even after placing the roots in light, it grows away from the light showing negative phototropism.



Q. 10. Give an example to show how hormones can influence visible changes in your body. (AS1)

Answer : An example to show how hormones can influence visible changes in our body is the functioning of gonads. Gonads are the sex glands: ovaries and testes. They produce ova and sperms but also secrete hormones. The various gonads are :

Ovaries - They produce estrogens, progesterone, relaxing and inhibin. Estrogens are secreted by Graafian follicles. Estradiol is the principal feminizing hormone. It stimulates the development of female secondary sex characteristics during puberty such as development and enlargement of breasts, broadening of the pelvic region, accumulation of fat in the lower part of the body, etc. and maintains them through the reproductive years of adult life.

Progesterone is secreted by corpus luteum. It stimulates further development of the uterine epithelium and mammary glands. Relaxin is secreted by corpus luteum only during the later stages of pregnancy and helps to soften ligaments especially those that hold the pubic symphysis. It affects women foot ligaments, she may experience an increase in shoe size following pregnancy.

Testes - Testes secrete male sex hormones called androgens. The main one is testosterone. It stimulates the growth & development of male secondary sex organs like seminal vesicles, prostate & penis. This hormone stimulates the development of male secondary sexual characteristics like the beard, mustache, and low pitch male voice in man.

Q. 11. How does a neuron differ from an ordinary cell in structure? Write notes. (AS1)

Answer : A neuron is a structural and functional unit of nervous system. A neuron consists of the main cell body and cytoplasmic processes arising from it.

Cell body or cyton - It varies in size and form. It maybe irregular, spherical, oval, rounded, star-shaped or pyramidal. Like a typical cell, it consists of cytoplasm, nucleus, and cell membrane. It has abundant cytoplasm called neuroplasm and a relatively large spherical central nucleus, with a distinct nucleolus. The cytoplasm has mitochondria, Golgi apparatus, rough endoplasmic reticulum, ribosomes, lysosomes, fat globules, pigment granules, neurofibrils, neurotubules and Nissl's granules. Presence of Nissl's granules and neurofibrils is characteristics to all neurons. Neurofibrils play a role in the transmission of impulses. Neurotubule is micro tubules which maintain the shape of the neuron. The Nissl's granules are irregular masses of rough endoplasmic reticulum with numerous attached and free ribosomes and polysomes.

Neurites - The processes of neurons are called neurites. They are of two types :

a) Dendrites - They are usually shorter, tapering and much branched. They maybe one to several. They contain neurofibrils, neurotubules and Nissl's granules.

b) Axon - It is a single very long process of uniform thickness. It contains neurofibrils and neurotubules but not Nissl's granules, Golgi complex, ribosomes, pigment granules, fat globules etc.

A normal ordinary cell is of two types :

Prokaryotic cell and eukaryotic cell.

Prokaryotic cell	Eukaryotic cell
a) It has one envelope organization. An organized nucleus is absent. Instead, a nucleoid is found.	a) It has two envelope organization. An organized nucleus is found. It is differentiated into nuclear envelope, chromatin, nucleoli, and nucleoplasm.
b) DNA is naked that is without histone proteins. DNA is usually circular. It lies freely in the cytoplasm.	b) Nuclear DNA is associated with histones. Nuclear DNA is linear. It lies in the nucleus.
c) Membrane-bound organelles are absent. Gas vacuoles are found. Thylakoids lie freely in the cytoplasm.	c) Membrane-bound organelles are present. True or sap vacuoles are commonly found.
d) Ribosomes are of 70 S type.	d) Ribosomes are 80 S type.

Q. 13. Man is the most intelligent animal. What could be the fact that helped us to reach such a conclusion? (AS1)

Answer : The brain stores the information so that behavior can be modified according to the past experience. This function makes the brain the organ of thought and intelligence. Another wonderful capacity of the human brain is communication through language. No other animal can pass on so much information through sounds as a human being can. Several animals can make sounds and communicate to a very limited extent through these sounds. Man has developed the ability through his brain to give a script to the sounds so that all the information he has gathered in his life time is written down and passed on to the next generation.

Q. 14. The axon of nerve cell in hand is shorter than the axon of nerve cell in the leg. Do you support this statement? Why? (AS1)

Answer : yes, because sciatic nerve in the leg contains neural axons that extend from the spinal cord all the way to the muscles in the foot, a distance of over a 1 meter. Usually, the length of the leg is more in size than hand. Hence the axon of nerve cell in hand is shorter than the axon of nerve cell in leg.

Q. 15. Organs respond to the external stimulus by a fraction of second. How do you feel about such controlling mechanism of the human body? (AS1)

Answer : The human body is equipped with most complex mechanisms without which survival is not possible. The human body is compatible to a great extent with various changes. Our body part, on receiving a stimulus react spontaneously.

Our body shows certain behavior on stimulating of sensory organs (receptor). As soon as our body senses a stimulus, a chemical signal is generated which travels down the neuron. The sensory nerve fibers bring sensory impulses from the central nervous system to the effector organs. The inner mechanism regarding the transmission of impulses is really interesting to know that the transmission is so quick that it takes the only fraction of second.

Q. 16. State whether the following actions are a voluntary action, reflex action or conditioned reflex. (AS1)

- A. Blinking**
- B. Cleaning the table**
- C. Playing on the key board**
- D. Salivating when food is put in the mouth.**
- E. We close our ears when we hear the unbearable sound**

Answer : Blinking comes under reflex action as the reflex action is a spontaneous automatic mechanical response to a stimulus without the will of the animal. Salivating when food is in the mouth is a reflex action as it's not under our control. Playing on the keyboard, cleaning the table and closing ears on loud sound is conditioned reflex action as conditioned reflex action is acquired reflexes during the lifetime.

Q. 17. What will happen to the potted plant kept near a window in the room? (AS2)

Answer : The plant kept near the window on the room will exhibit phototropism. Plants actively show a response to light maybe to specific wavelengths which allows them to adjust and adapt to their surrounding environment and accelerate their growth. Plants have the ability to sense or detect light. Special molecules called photoreceptors help the plant in sensing light. The photoreceptors are made up of a special protein which is linked to chromophore (light absorbing pigment). The main photoreceptor is phototropin. Phototropism is of two types: positive phototropism & negative phototropism. Shoots and all those plant parts which grow above the ground show positive phototropism as the shoot grows towards the light and bends in the process. Roots on the other hand show geotropism which means growth against the light. It is called negative phototropism.

Q. 18. What happens if all functions of the human body is controlled only by the brain? (AS2)

Answer : Our body functions are mostly controlled by brain except for reflex actions and involuntary actions, if reflex actions are also controlled by the brain, it will take more time to complete the action and will cause danger to our body. We won't be able to escape from sudden accidents. A number of involuntary actions take place in our body. If all these functions are shifted to the brain, it will feel the burden and its performance will be decreased.

Q. 19. If you visit a doctor what doubts you would like to clarify about pancreas? (AS2)

Answer : i. What is Pancreas?

ii. Is it an endocrine gland or exocrine gland?

iii. What is the digestive juice secreted by an exocrine part of the gland?

iv. What is the name of the endocrine part?

v. What are the cells that secrete hormone in the endocrine part?

vi. What is a hormone secreted by the Pancreas?

vii. Under which conditions Pancreas secrete insulin?

viii. What is the function of the insulin?

ix. Name the disease caused by the deficiency of Insulin?

x. Where is Pancreas located in our body?

xi. How is diabetes characterized?

xii. How to control Diabetes? Is pancreatic cancer hereditary?

Q. 20. Take a small potted plant. A cover base portion of the plant tightly and hang the part upside down. Observe the plant for a week. Based on your observation how can you support phototropism? (AS3)

Answer : Plants actively show a response to light maybe to specific wavelengths which allows them to adjust and adapt to their surrounding environment and accelerate their growth. Plants have the ability to sense or detect light. Special molecules called photoreceptors help the plant in sensing light. The photoreceptors are made up of a special protein which is linked to chromophore (light absorbing pigment). The main photoreceptor is phototropin. Phototropism is of two types: positive phototropism & negative phototropism. Shoots and all those plant parts which grow above the ground show positive phototropism as the shoot grows towards the light and bends in the process. Roots on the other hand show geotropism which means growth against the light. It is called negative phototropism. Therefore, even after hanging the base portion of the plant upside down, the roots will grow against the direction of light. It will show geotropism always.

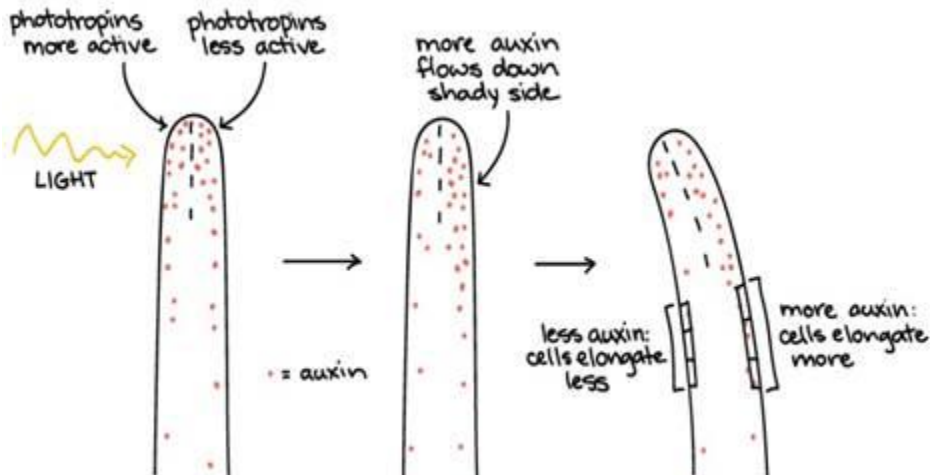
Q. 21. Take a cock feather touch smoothly at a different part of your body. Find out which portion of the body has high sensation. Is this similar to sleeping? (AS3)

Answer : When the cock feather is touched at differences parts of the body following thing happens :

The most sensitive part of my body is the foot. When the cock feather is rubbed gently against my feet, I feel or get that tickling sensation and it is even experienced in sleep. While sleeping, if my foot is touched with a cock feather, I can feel the sensations. Even during sleep, the sensation can be felt. Therefore, sensation caused due to cock feather can be felt even during sleep.

Q. 22. What procedure do you follow to understand the effect of plant growth hormones (in agar medium) in the terminal portion of the tip of the stem (coleoptiles)? (AS3)

Answer : In lower plants growth is diffused as every cell can divide and enlarge. Higher plants possess specific areas which take part in the formations of new cells. These areas are called meristems. We can understand the effect of plant growth hormone that is auxin, (in agar medium) in the coleoptile by the experiment performed by Went(1928). Went collected the growth stimulating substance in agar jelly. He discovered that the hormone, auxin traveled basically that is from the tip towards the base. Agar block containing the chemical caused bending of a decapitated coleoptile according to its concentration. The growth promoting substance was named by him as auxin. Auxin helps in elongation of cells, thus it promotes more cell formation on the shady region of the plant than the region receiving light. Hence, it causes bending.



Q. 23. Collect information on the actions controlled by spinal cord by using reference books from your school library. (AS4)

Answer : The spinal cord is a posterior part of the central nervous system which runs mid dorsally within the vertebral column. It lies in the neural canal of the vertebral column. The spinal cord extends from the medulla oblongata. In an adult, the spinal cord is from 42-45 cm long. By adulthood, the area within the vertebral column below the second lumbar vertebra contains spinal nerves that branch from the spinal cord at higher levels. In each segment of the spinal cord, a spinal nerve arises from each side of the cord. Spinal cord performs two major functions: the stimuli are passed to and from the brain through the spinal cord and it is the center of spinal reflex actions. The spinal nerves are formed by the union of the dorsal and ventral roots shortly after they leave the spinal cord. All spinal nerves are mixed nerves as they carry both sensory and motor impulses. Spinal nerves join to form the following plexuses :

i. **cervical plexus** - it innervates the neck and diaphragm.

ii. **Brachial plexus** - it connects the chest and arm.

iii. **Lumbar plexus** - it innervates the legs.

iv. **Sacral plexus** - it connects the pelvic region.

v. **Coccygeal plexus** - it also innervates the pelvic region.

Hence, the spinal nerves show connections with various above organs and body parts.

Maximum reflex actions are controlled by spinal cord and are called spinal reflex actions.

For example,

- a) closing of eyes when strong light is flashed across them.
- b) withdrawal of limbs when they are touched by hot things.
- c) watering of mouth on seeing favorite food.
- d) opening of mouth on hearing a loud sound.
- e) typing, riding a bicycle, knitting, etc.

Q. 24. Read the following sentences and compare with endocrine glands. (AS4)

Pheromones are chemical substances secreted by organisms. These act as chemical signals secreted by exocrine glands. Pheromones are used as signals by the members of same species. Honey bee secretes pheromones that attract other bees to the location of food.

Answer : Pheromones are secreted by exocrine glands of the skin and are poured on the surface of the skin hence they are called ectohormones. The smell of these substances affects the mutual behavior of members of species. Certain insects secrete pheromones to transmit the information of food sources or danger to their fellow insects. Certain insects secrete pheromones to attract their mating partners.

Exocrine glands are glands with ducts. The secretions of these glands are carried by ducts to a particular organ for some metabolic activities.

Endocrine glands are ductless glands. Their secretions get absorbed into the blood circulation to reach the specific organs to initiate a particular metabolic change. The chemicals secreted are called hormones. Hormones may be steroids, proteins, peptides or amino acids.

Pheromones are also a chemical substance which is secreted by exocrine glands but they are not transferred by ducts instead they are poured directly on the surface of the skin.

Q. 25. Collect the information about cranial nerves. Spinal nerves from the internet or from your school library. (AS4)

Answer : The nerves originate from central nervous system and connect either receptor or effector organs from peripheral nervous system. Those nerves which arise from brain are called cranial nerves and those which arise from spinal cord are spinal nerves.

Cranial nerves - They are named so because they pass through various foramina in the cranial bones . There are 12 pairs of cranial nerves present in man.

1) Olfactory nerve - Its nerve fibres arise in the olfactory epithelium of the nasal chamber. It is sensory nerve which carries impulse of smell from olfactory epithelium to brain.

2) Optic nerve - They originate in the retina of the eye and combine to form optic nerve. It is sensory and carries impulses of sight from the retina of the brain.

3) Oculomotor nerve - It arises from the floor of the midbrain. It innervates the eye muscles. It is a motor nerve and carries impulses from the brain to these muscles for controlling the movements of eye ball.

4) Trochlear nerve - It innervates an extrinsic eye muscle that loops a pulley-shaped ligament in the orbit. The trochlear nerve is the thinnest and smallest cranial nerve. It originates from the floor of the midbrain.

5) Trigeminal nerve - It is the largest cranial nerve. It arises from the ventral surface of the pons Varolii. It divides into three branches :

- a. **Ophthalmic nerve** - It is the smallest branch of trigeminal nerve. It runs forward through the eye orbit and innervates the lacrimal glands , the conjunctiva , the forehead , the eyelids etc. It is sensory nerve and carries impulses of touch from the above mentioned areas to the brain.
- b. **Maxillary nerve** - It innervates the cheek , the upper gums , the upper teeth and lower eyelids, etc. It is sensory branch and carries stimuli from these areas.
- c. **Mandibular nerve** - It is the largest branch. It distributes nerve fibres to the teeth , gums of lower jaw , pinna of the ear , lower lip and the tongue. It is a mixed branch showing both sensory and motor functions.

6) Abducens nerve - It controls the extrinsic eye muscle that abducts the eyeball. It originates from pons Varolii. It is a motor nerve and controls the movements of the eyeball.

7) Facial nerve - It arises from a lower part of pons Varolii. It innervates the taste buds of the tongue and muscles of the face. It also innervates the salivary glands. It is a mixed nerve.

8) Auditory nerve - It arises from the internal ear. It is formed by two branches : cochlear nerve and vestibular nerve.

9) Glossopharyngeal nerve - It originates from the side of medulla oblongata. It controls secretion of saliva, sense of taste and movement of the pharynx.

10) Vagus nerve - It is the longest cranial nerve. It arises from the side of medulla oblongata. It is a mixed nerve. It controls the visceral sensations , movement, etc.

11) Accessory nerve - It originates from both the brain and spinal cord. It is a motor nerve which innervates the muscles of the pharynx ,larynx , neck and shoulder .

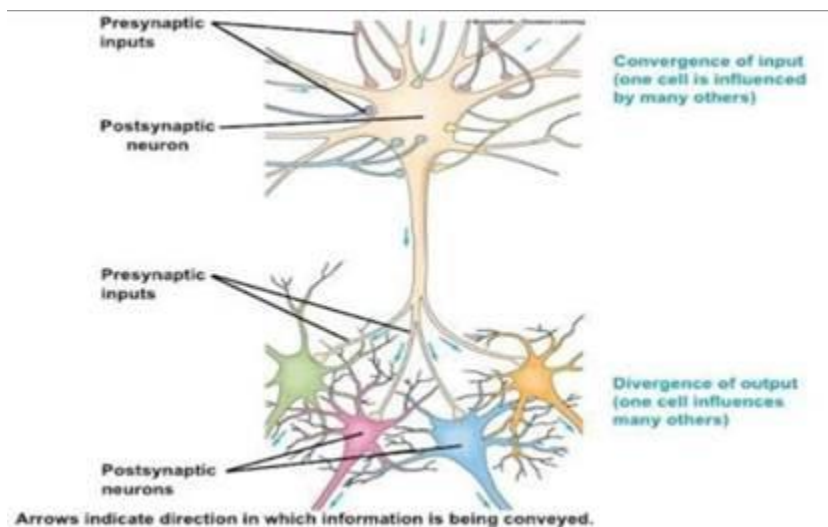
12) Hypoglossal nerve - It originates from the ventral side of medulla oblongata. It innervates the muscle of tongue and hyoid apparatus. It is a motor nerve which controls movement of the tongue.

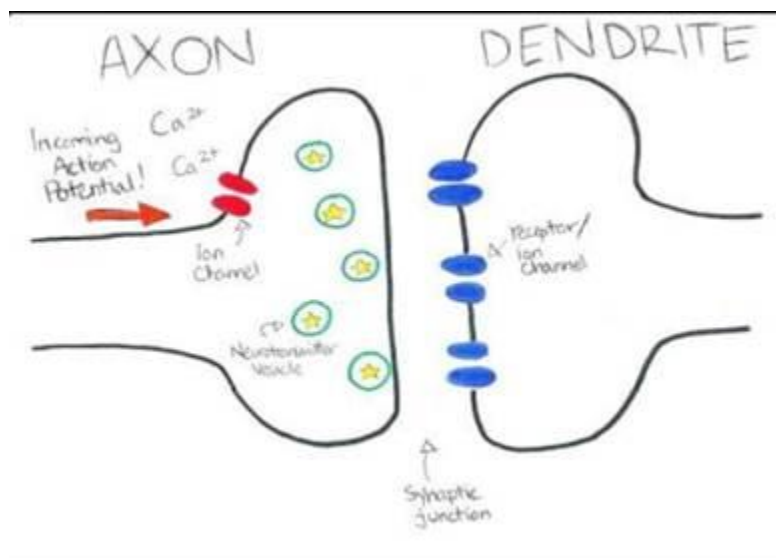
Spinal nerves - 31 pairs of spinal nerves are named and numbered according to the vertebrae with which they are associated. It includes 8 pairs of cervical nerves , 12 pairs of thoracic nerves, 5 pairs of lumbar nerves, 5 pairs of sacral nerves and one pair of coccygeal nerves.

The spinal nerves are formed by the union of dorsal and ventral roots shortly after they leave the spinal cord. Each spinal nerve has afferent and efferent fibers. All spinal nerves are mixed nerves as they carry both sensory and motor impulses.

Q. 26. Draw a picture representing the connection between dendrite-dendrite, axon-dendrite. Why do they connect like that? (AS5)

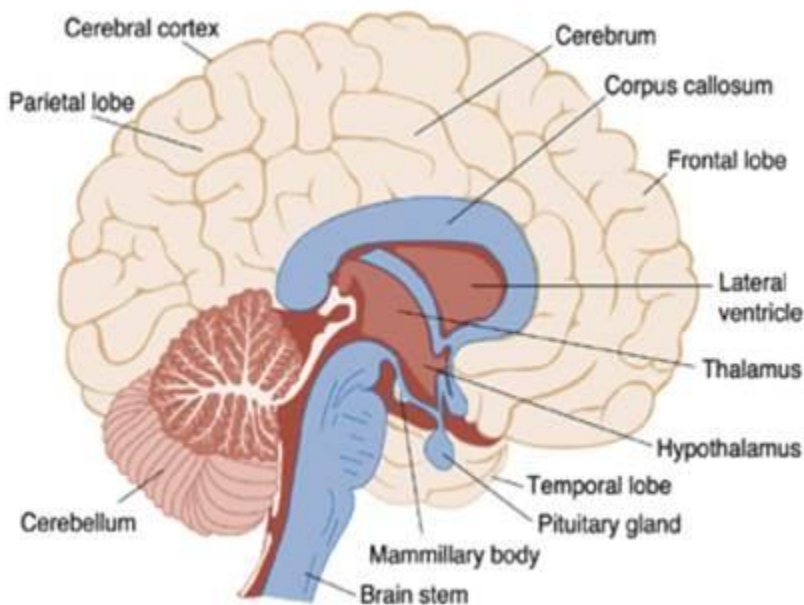
Answer :





Q. 27. Draw a neatly labeled diagram of Brain and write few points how it is protected. (AS5)

Answer : The labelled diagram of brain is given as:



In proportion to size, the human brain is the largest among all animals. The brain is a very delicate organ well protected inside the brain box (cranium) of the skull. The brain is protected by three membraneous coverings called meninges (meninx - membrane) which continue backward on the spinal cord.

1- Dura mater: The outermost tough fibrous membrane.

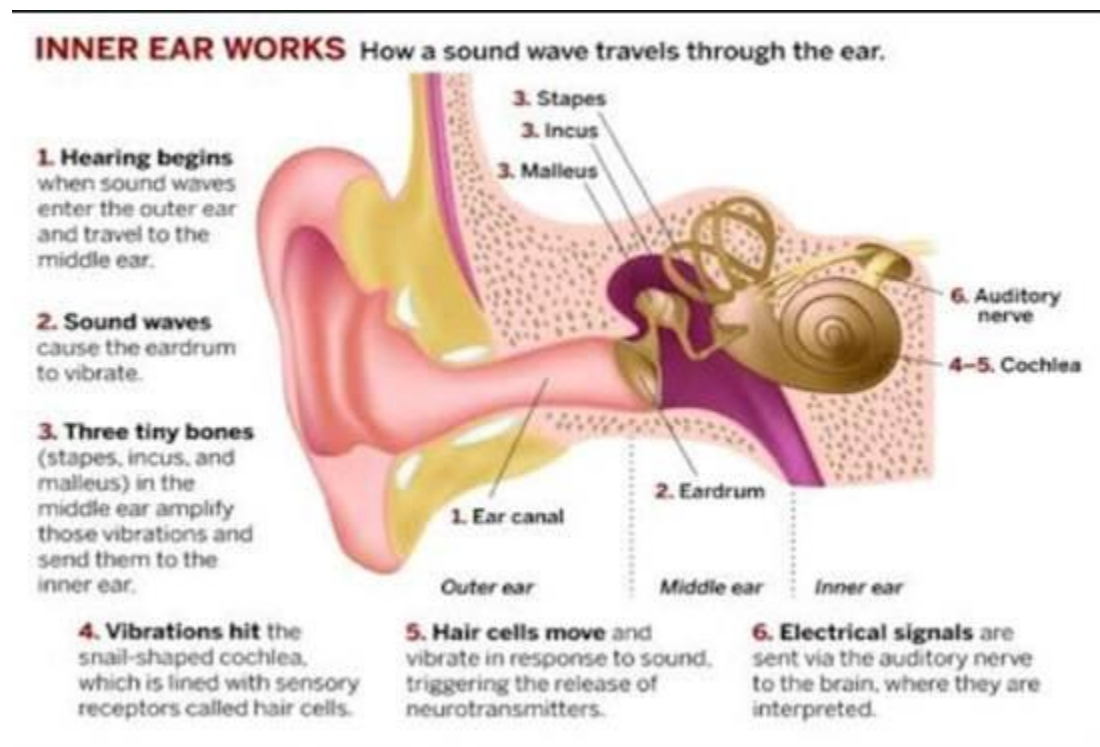
2- Arachnoid: thin delicate middle layer giving web like a cushion.

3- Pia mater: The innermost highly vascular membrane richly supplied with blood.

Meningitis is the inflammation of the meninges. The space between the covering membranes is filled with watery fluid - cerebrospinal fluid which acts like a cushion to protect the brain from shocks.

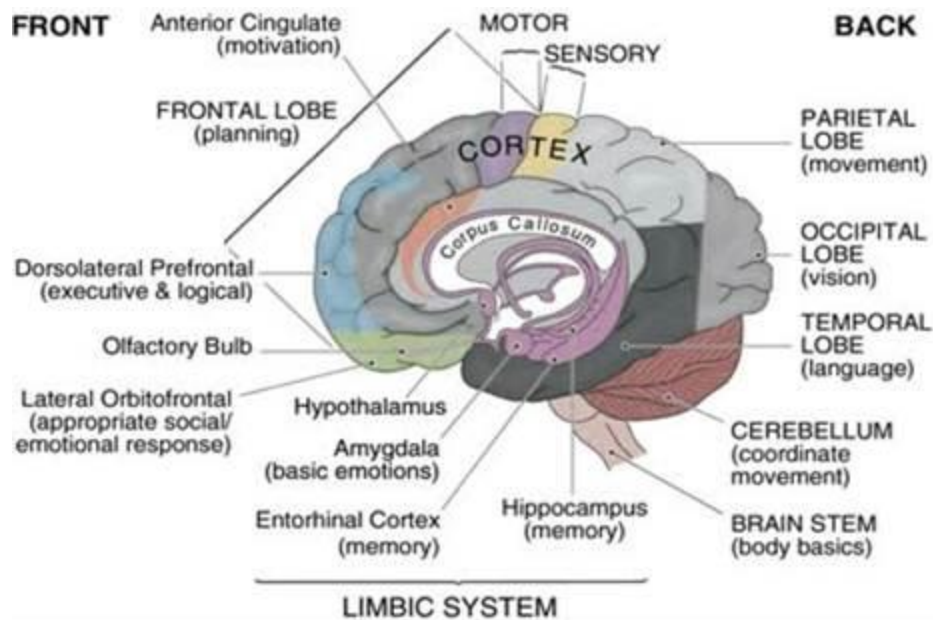
Q. 28. You are walking in the traffic suddenly you heard a loud sound. How coordination takes place in this situation among respected organs? Draw a block diagram to explain this situation. (AS5)

Answer :



Q. 30. Draw a labeled diagram of brain. (AS5)

Answer :



Q. 31. Observe different actions performed by your classmate for a period of 45 minutes. Out of those actions which are controlled by voluntary and involuntary pathways. (AS5)

Answer : On the basis of various actions performed by my classmate ,following are the results:

Involuntary actions	Voluntary action
They include actions which are not under our control. Like breathing, eye reflexes were observed by me. Cardiac muscles are involuntary muscles. They contract without our knowing.	Voluntary action is under our control. Like snapping of fingers, raising a hand when the question was asked, talking, eating, reading, running was all the voluntary action observed by me. Our hand muscles are voluntary muscles. They act according to the impulses given by our brain.

Q. 32. It's very interesting to watch a creeper entwining its tendril to the support. Is not it? How do you express your feelings in this situation? (AS6)

Answer : It wouldn't be interesting to watch a creeper entwine its tendril to the support as they don't have tendrils. Creepers have prostrate stems which root at intervals. Their stem is long, flexible and sensitive. Creepers are of three kinds :

a) Runners - They are special narrow, green and above ground horizontal or prostrate branches which develop at the bases of erect shoots. A number of runners arise from erect shoots and spread in different directions. For example, Oxalis, Lawn grass etc

b) Stolon - They are elongated, horizontal or arched runners which can cross over small obstacles e.g. Jasmine, Wild strawberry, Peppermint . The tip of stolon grows above the ground level.

c) Offsets - They are one internode long small runners which are found in rosette plants at the ground or water level e.g. Water lettuce, water hyacinth.

Q. 33. Hormones are released at a specific place, a specific time for a specific function. Prepare a cartoon on hormones with a nice caption. (AS7)

Answer : The endocrine glands secrete chemicals called hormones. Hormones are non-nutrient chemicals which act as intercellular messengers and are produced in trace amounts. They are transported by bloodstream from the endocrine cells to serve as chemical messengers which act on target cells or organs.

Fill in the blanks

Q. 1. Fill in the blanks

The largest region of the brain is _____cerebrum_____

Answer : The cerebrum is the largest and most complex of all parts of the human brain. It consists of left and right hemisphere connected by a large bundle of myelinated fibers, the corpus callosum. The outer portion of the cerebrum is called cerebral cortex that makes up the grey matter of the cerebrum. The surface of the cortex is greatly folded. The upward folds are called gyri and inward grooves are called sulci. They are collectively called white matter. In the cerebral hemisphere, three types of functional areas are present :

i. Sensory areas - They receive impulses from the receptors.

ii. Association areas - They interpret the input, store the input and initiate a response in light of similar past experience.

iii. Motor areas - They transmit impulses to the effectors.

Q. 2. Fill in the blanks

A point of contact between two neurons is _____synapse_____

Answer : The synapse is an area of functional contact between one neuron and another for the purpose of transferring information. Synapses are usually found between

the fine terminal branches of the axon of one neuron and the dendrites and cell body of another.

Q. 3. Fill in the blanks

 Auxin phytohormone is responsible for cell elongation and differentiation of shoots and roots.

Answer : Auxins are weakly acidic hormones promoting cell elongation especially of shoots at a concentration less than 100 ppm which is inhibitory to the roots. Among the growth regulators, auxins were the first to be discovered. Cell elongation is the fundamental activity of auxins. Auxin is known to promote cell division of vascular cambium. Auxin promotes root initiation at a concentration which is inhibitory for growth of the intact root.

Q. 4. Fill in the blanks

Thyroxin is responsible for protein synthesis

Answer : The thyroid gland secretes thyroxine. Thyroxine contains four atoms of iodine. Thyroxine regulates the metabolic rate of the body and maintains BMR(Basal Metabolic Rate). They stimulate protein synthesis and help to promote the growth of the body tissues.

Q. 5. Fill in the blanks

Gibberellins and auxins promote growth in plants while abscisic acid arrests the same. Some situations are discussed here, State which hormones would be needed and why?

A. A gardener wants large dahlias he should use along with nutrients and other things auxin hormone.

B. In a dwarf plant the branches have to be thickened one would use ethylene hormone.

C. Seeds are to be stored for a long time abscisic acid hormone can help.

D. Cutting the apex or tip of plants so that there are several lateral buds auxin hormone can be used.

E. The part of the brain that helps you in solving puzzles is cerebrum .

Answer : A. The most fundamental activity of auxin is cell enlargement. Cell enlargement is caused by solubilization of carbohydrates, loosening of wall microfibrils, synthesis of more wall materials, increased membrane permeability and respiration.

B. Ethylene is a gaseous hormone which stimulates transverse or isodiametric growth but retards the longitudinal one. Ethylene inhibits longitudinal growth but stimulates transverse or horizontal growth and swelling of axis.

C. Seed dormancy is mainly caused by abscisic acid . Dormancy allows seed to tolerate dessication and extremes of temperature better. The buds as well as seeds sprout only when abscisic acid is overcome by gibberellins. Because of its action in inducing dormancy , abscisic acid or ABA is also named as dormin.

D. Auxins are weakly acidic hormones promoting cell elongation especially of shoots at a concentration less than 100 ppm which is inhibitory to the roots. Among the growth regulators auxins were the first to be discovered. Cell elongation is the fundamental activity of auxins. Auxin is known to promote cell division of vascular cambium. Auxin promotes root initiation at a concentration which is inhibitory for growth of intact root.

In apples, flowers and fruits are formed on dwarf shoots. Application of naphthalene acetic acid increases the number of dwarf shoots as well as the number of fruits.

E. Cerebrum is the largest part of brain. Each lobe of cerebral hemisphere performs specific function . In the frontal lobe creative ideas occur. In the temporal lobe sounds are interpreted. In the parietal lobe feelings about touch ,hot and cold and pain are registered. It is this area that allows to accurately follow directions on map, reading a clock and dressing a person. The occipital lobe is one where eyes interpret what is seen.

Choose the correct Answer

Q. 1. A person has loss of control on emotions, which part of brain stops it's function. ()

- A. cerebrum**
- B. diencephalon**
- C. mid brain**
- D. cerebellum**

Answer : The parietal lobe of cerebrum feelings about touch , hot , cold , pain are registered. Crebral hemisphere performs specific but various functions.

Q. 2. Leaf movement in mimosa helps to ()

- A. reduce photosynthesis**
- B. protects from grazers**

- C. releasing Phyto hormones**
- D. regulate its growth**

Answer : The leaf of Mimosa has 15-20 pairs of small leaflets along each midrib. As the leaf receives a stimulus such as a touch or wind , etc , it folds in & the stem droops. It is due to change in the turgor pressure at the point of touch. Turgor pressure is a hydrostatic pressure which develops due to the osmotic entry of solvent into it. Mimosa pudica shows seismonasty. Turgor pressure changes in the cells of their pulvini. Regular turgor changes in the leaflet bases cause rhythmic autonomic movement. In case of loss of turgidity, the shoots droop and the leaves show wilting. In wilting , the individual cells of leaves become flaccid due to loss of water from their interior.

Q. 3. Diabetes is related to this gland.

- A. Thyroid**
- B. pancreas**
- C. adrenal**
- D. pituitary**

Answer : The most common endocrine disorder of the pancreas is the diabetes mellitus. It is caused by failure of beta cells to produce adequate amount of insulin . The blood glucose concentration is elevated above the normal range. Glucose is excreted in the urine causing excessive urination and dehydration of body tissues.