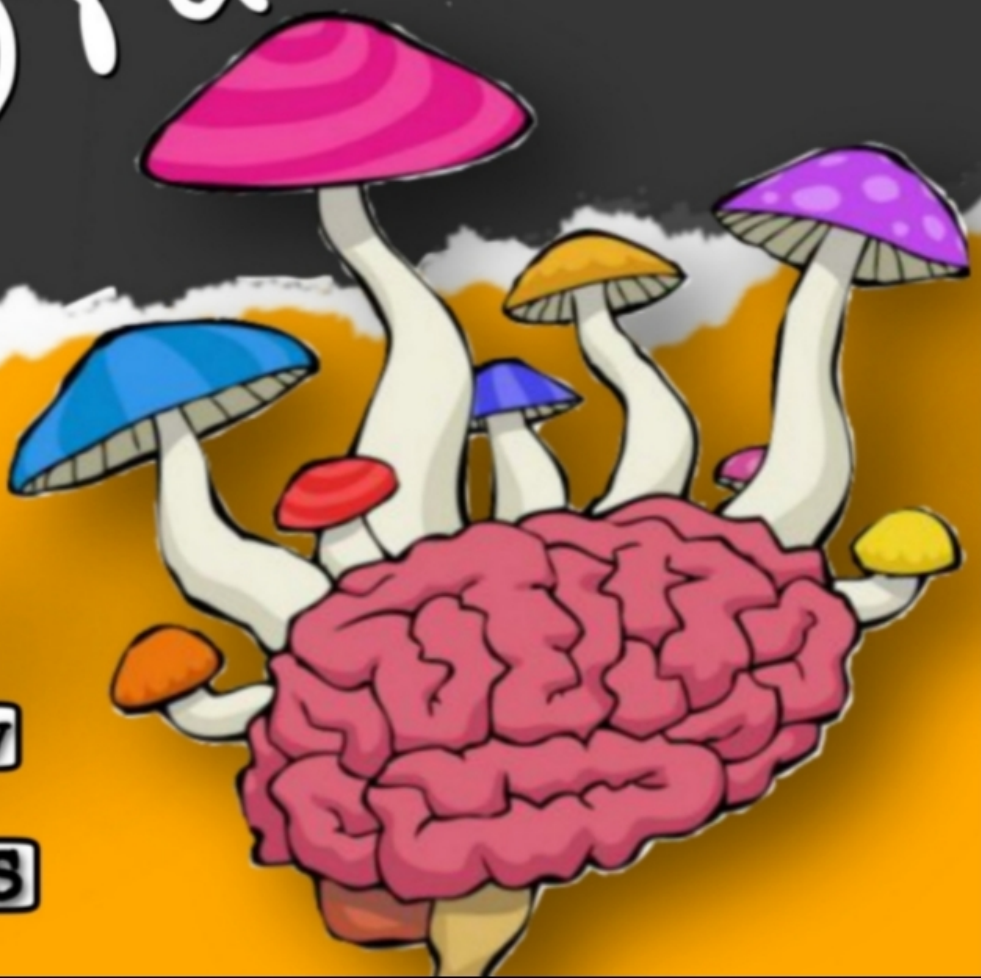




/padhle akshay

PRESENTS

# Control And Coordination



padhle.akshay



NO BAKWAS

 /padhleakshay



# Previous Years Questions

**SCAN  
& DONATE**



padhleakshay@apl

**Q. Why is chemical communication better than electrical impulses as a means of communication between cells in a multicellular organisms? [CBSE 2020]**

**Ans.** In animals, the message communicated in the form of nerve impulses, from receptors to central nervous system and from latter to effectors is very quick. But nerve impulses can reach only those animal cells which are connected by the nervous tissue. These cells after generation and transmission of nerve impulses, take sometime to reset their mechanism before a new impulse is generated and transmitted. It means, cells cannot continuously generate and transmit electrical impulses. This is the reason most multicellular organisms use another means of communication called chemical communication. In chemical communication information spreads out throughout the body by blood and its effects lasts longer. Chemical communication is however slow but it can reach all the cells of body regardless of nervous connections.

**Q. A squirrel is in a scary situation. Its body has to prepare for either fighting or running away. State the immediate changes that take place in its body so that the squirrel is able to either fight or run. [CBSE 2020]**

**Ans.** When squirrel is in a scary situation then its nervous system stimulates the adrenal glands to secrete more adrenaline hormone into blood.

This adrenaline hormone increases heartbeat, breathing rate, blood flow into muscles and causes liver to put more stored glucose into its blood. All these actions of adrenaline hormone produces a lot of energy in squirrel's body. In this way, squirrel prepares itself for fighting or running away action.

**Q. A cheetah, on seeing a prey moves towards him at a very high speed. What causes the movement of his muscles? How does the chemistry of cellular components of muscles change during this event? [CBSE 2020]**

**Ans.** The cheetah senses its prey by photoreceptors and the information is sent to the central nervous system. The response is then carried by neurons. Along with nervous system, the hormonal system also plays a role. Adrenaline hormone produced by the adrenal glands triggers the flight or fight action. On seeing a prey, these hormones are released into the cheetahs blood stream. It speeds up heartbeat, breathing increases blood flow into leg muscles and causes liver to put more stored glucose into cheetahs blood. All these actions of adrenline hormone produces a lot of energy which helps cheetah to run fast.

**Q. How can we control hypothyroidism?**

**Ans.** Hypothyroidism can be controlled by using iodised salt.

**Q. State the function of thyroxine in human body. [CBSE 2019]**

**Ans.** Thyroxine regulates carbohydrate, protein and fat metabolism in the body. It promotes growth of body tissues also.



**Q. Define geotropism. Draw a labelled diagram of a plant showing geotropic movement of its parts.** [CBSE 2020]

**Ans.** Geotropism refers to the upward and downward growth of shoots and roots respectively in response to the pull of earth or gravity. If the plant part moves in the direction of gravity, it is called positive geotropism. Likewise, if the plant part moves against the direction of gravity, it is termed as negative geotropism. Shoots are usually negatively geotropic and roots are usually positively geotropic. A well labelled diagram of plant showing geotropism is:



**Q. What is feedback mechanism of hormonal regulation. Take the example of insulin to explain this phenomenon.** [CBSE 2019]

**Ans.** The endocrine glands secrete hormones depending upon the need of the organism. The level of hormones secreted should be in an accurate amount. The regulation of the quantity of the hormones and the timing of its release are controlled by feedback mechanisms.

There are two types of feedback mechanisms positive and negative feedback.

**Positive feedback:** In this mechanism, the response accelerates after the feedback. The effect is further intensified in the same direction. It helps in speeding up the process occurring in various body systems. It is the opposite of negative feedback.

**Negative feedback:** In this mechanism, the information given by the feedback causes a reverse response. It occurs when the system needs to slow down or completely stop a process. For example, when we consume a carbohydrate rich diet, it is digested into glucose. The glucose is then absorbed by the blood. This results in the increase of blood sugar level and leads to the stimulation of the pancreas to secrete insulin. Insulin stimulates the target cells, to take up the extra glucose from the blood. This glucose is either used during respiration or stored as glycogen. Thus, the level of insulin is reduced as pancreas receive negative feedback

**Q. For a receiving tennis player. Explain what the path from the stimulus to the response is?** [CBSE 2014]

**Ans.**

- (i) To receive the stimulus (tennis ball on the racquet).
- (ii) Sensory neurons of a spinal nerve to convey the stimulus to spinal cord.
- (iii) Spinal cord to interpret the stimulus and give appropriate command to motor neurons.
- (iv) Motor neurons of a spinal nerve to convey motor command to effector.
- (v) Effectors or muscles to execute the effect by muscular movement (hit the tennis ball from the racquet).

**Q. What is meant by hydrotropism? Give an example.** [CBSE 2013]

**Ans.** The response of a plant towards water is called hydrotropism. The roots of plants show hydrotropism and they show positive hydrotropism.

**Q. What are plant hormones?** [NCERT, CBSE 2013]

**Ans.** Plant hormones are chemicals present in plants which help to coordinate growth, development and responses to stimuli and environment.

For example, auxins, gibberellins, cytokinins, abscisic acids are different plant hormones.

**Q. How do auxins promote the growth of a tendril around a support?** [NCERT, CBSE 2013]

**Ans.** When tendrils come in contact with any support, the part of the tendril in contact with the object does not grow as rapidly as the part of the tendril away from the object. This is caused by the action of auxin hormone. Less auxin occurs on the side of contact as compared to the free side. As a result, auxin promotes growth on the free side and the tendrils coil around the support.

**Q. State the role of the brain in reflex action.** [CBSE 2010,15]

**Ans.** The sensory area of brain receives information, interprets it and makes a rapid decision. The message is transmitted to the motor area. The motor neuron sends information to the receptor organ. The entire process is controlled by medulla in the hindbrain.

**Q. How does feedback mechanism regulate the hormone secretion?** [CBSE 2014]

**Ans.** The feedback mechanism regulates the timing and amount of hormone to be secreted, e.g., if a person has more sugar in his blood, this is detected by the cells of the pancreas. As a result, more insulin will be secreted to oxidise the sugar. In a reverse situation, the secretion of insulin will be reduced.

**Q. Why is the use of iodised salt advisable?** [NCERT, CBSE 2011,12]

**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. If iodine is deficient in our diet, there is a possibility that we might suffer from goitre. The thyroid gland enlarges causing swelling in the neck. Iodised common salt contains proper content of iodine. Thus, to avoid deficiency of iodine, iodised salt is recommended.

**Q. Why are some patients of diabetes treated by giving injections of insulin?** [NCERT, CBSE 2010, 12]

**Ans.** Diabetes is caused due to less or no secretion of hormone insulin by pancreas. In such a person, blood sugar level is high. Insulin converts extra sugar present in blood into glycogen. Thus, patients suffering from diabetes are given insulin injection to control their blood sugar level.

**Q. How do auxins help in bending of stem toward light? Explain. [CBSE 2012]**

**Ans.** When growing plants detect light, a hormone called auxin, synthesized at the shoot tip helps the cells to grow longer. When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot. This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light. Thus, plant appears to bend towards light.

**Q. Name the part of neuron [CBSE 2013]**

**(i) where information is acquired.**

**(ii) through which information travels as an electrical impulse.**

**Ans. (i)** The information is acquired at the end of the dendrite tip of a nerve cell.

**(ii)** The information travels as an electrical impulse from the dendrite to the cell body and then along the axon to its end.

**Q. What is a cerebrospinal fluid? What is its function? [CBSE 2013]**

**Ans.** The fluid which fills the space between the membranes which cover the brain is called cerebrospinal fluid.

**Function-**It protects the brain from mechanical shocks.

**Q. Tendrils encircle or coil around the object in contact with it. Elaborate. [CBSE 2011, 12, 13]**

**Ans.** 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 part of the tendril away from the object. This causes the tendril to circle around the object and thus, cling to it.

**Q. What happens if the synapse between two neurons? [NCERT, CBSE 2013]**

**Ans.** Synapse is the gap between nerve ending of one neuron and dendrites of another. At synapse, the electrical impulse generated at dendrites of a neuron is passed on to dendrite of another neuron in the form of chemicals by axon ending of the first neuron. Synapse ensures that nerve impulse travels only in one direction. A similar synapse allows the delivery of impulse from the neuron to the other cells, like muscle cells.

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

**Or [NCERT, CBSE 2013]**  
**Explain how the human body responds when adrenaline is secreted into the blood. [CBSE 2012]**

**Ans.** Adrenaline hormone is secreted in large amounts when a person is frightened, or mentally disturbed. When it reaches the heart, it beats faster to supply more oxygen to our muscles. The breathing rate also increases because of the contractions of diaphragm and the rib muscles. It also raises the blood pressure, and allows more glucose to enter into the blood. All these responses together enable our body to deal with the emergency situations.

**Q. What constitutes the central and peripheral nervous systems? How are the components of central nervous system protected? [CBSE 2011]**

**Ans. Central Nervous System** It is hollowed part of nervous system that lies along the mid-dorsal part of the body. It has two parts-brain and spinal cord. **Peripheral Nervous System** It is solid lateral part of nervous system that develops from CNS and connects different parts of the body with CNS. Peripheral nervous system has two components: voluntary and involuntary. Voluntary peripheral nervous system is under the control of will. It consists of cranial nerves from brain and spinal nerves from spinal cord. Involuntary peripheral nervous system works independent of will. It develops from some cranial and spinal nerves. Involuntary peripheral nervous system is also called autonomic nervous system. It has two parts sympathetic and parasympathetic. They control the functioning of various internal body parts. **Protection of brain** Cranium. **Protection of spinal cord** Vertebral column.



watch animated lecture at: [padhleakshay.com](https://padhleakshay.com)





/padhleakshay



# Diagram Based Questions

**SCAN  
& DONATE**

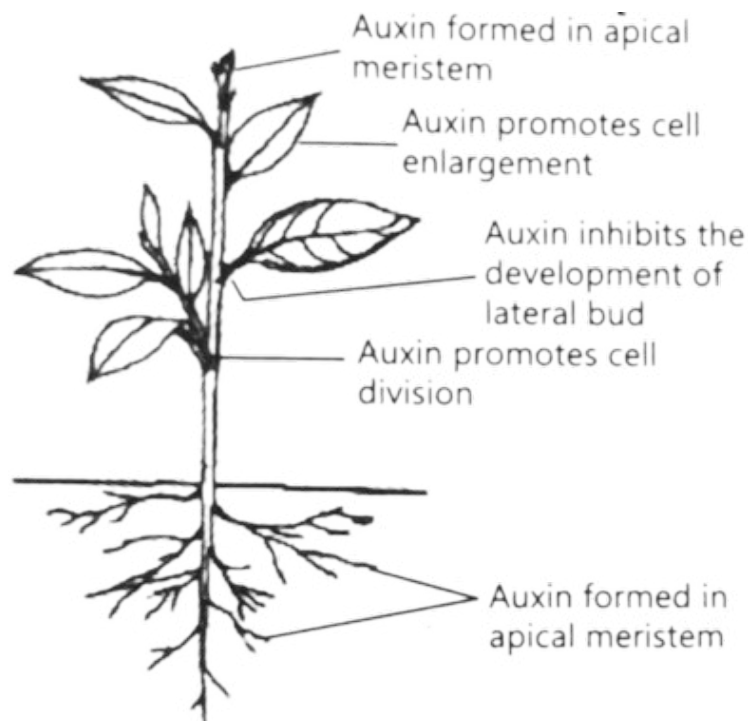


padhleakshay@apl



**Q. Illustrate with the help of a diagram, the effect of auxins in different parts of a plant. [CBSE 2014]**

**Ans.**

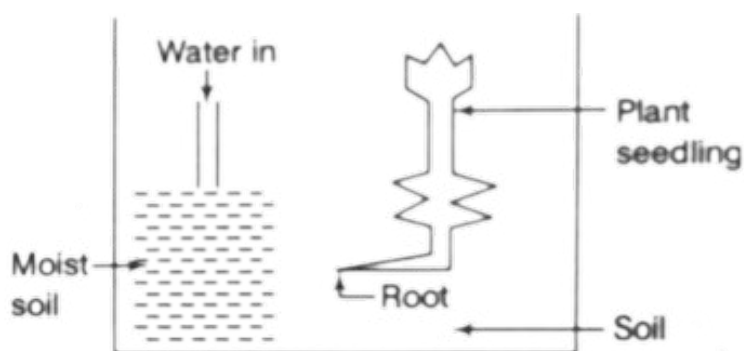


**Q. Design an experiment to demonstrate hydrotropism. [NCERT, CBSE 2013]**

**Ans. Procedure**

- Take a tray filled with soil.
- Plant a seedling in the tray at one end.
- To the other end add water to the soil with the help of a pipe as shown in the figure.

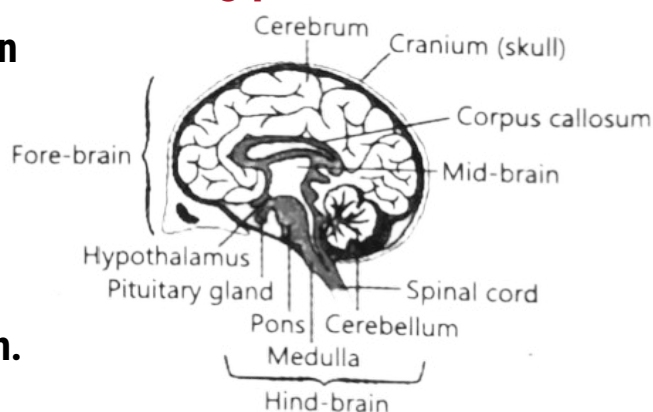
**Observation** The root (radicle) of the plant seedling moves towards the wet soil. This shows that roots are positively hydrotropic.



**Q. (a) Draw a well-labelled diagram of Human brain. [CBSE 2013]**

**(b) Which is the main thinking part of brain?**

**Ans. (a) Human Brain**

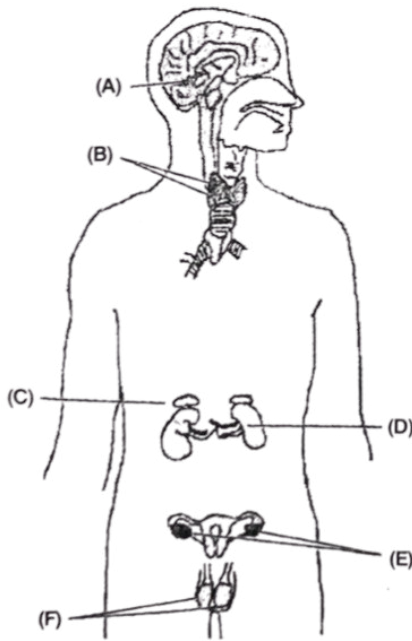


**(b) Fore-brain.**

**Q. (a) Identify the endocrine glands A, B, C, D, E and F in the given diagram. (b) List the functions of parts D and F. [CBSE 2012]**

**Or**

**Name the hormones secreted by the pancreas and specify one function of it. [CBSE 2018]**



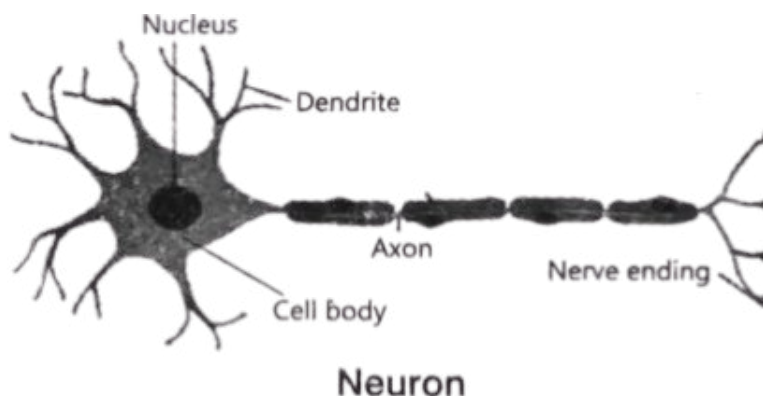
**Ans. (a) A-Pituitary, B-Thyroid, C-Adrenal, D-Pancreas, E-Ovaries (in female), F-Testis (in male).**

**(b) Pancreas Secrete insulin which controls amount of sugar in blood. Testis Secrete testosterone which controls sperm production/ secondary sexual character.**

**Q. Draw the structure of a neuron and explain its function. [NCERT, CBSE 2012, 17]**

**Ans. Functions** The information acquired at the end of the dendritic tip of a neuron sets off a chemical reaction which creates an electrical impulse. This impulse travels from the dendrite to the cell body, and then along the axon to its end. At the end of axon, the electrical impulse sets off the release of some chemicals, which cross the synapse and start a similar impulse in a dendrite of the next neuron.

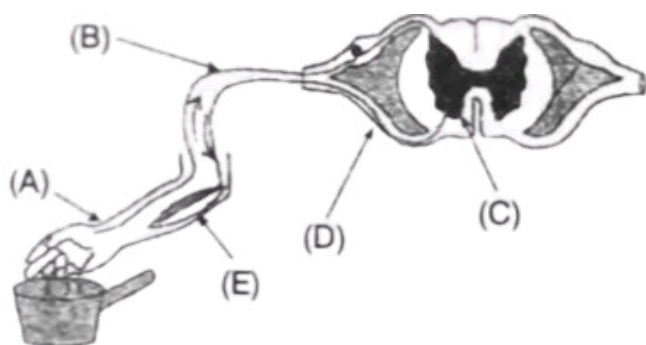
**In this way nervous impulses travel in the body. Thus, nervous tissue is made up of an organized network of neurons which are specialized for conducting information via electrical impulse from one part of the body to another.**



**Q. In the given, diagram of reflex arc**

**(a) Name the parts labelled A, B, C, D and E**

**(b) Write the functions of B and E**



**Ans. (a) A->receptor**

**B->sensory neuron/nerve**

**C->relay neuron/interneuron**

**D->motor neuron/nerve**

**E->effector**

**(b) B -> Carries impulse from receptor to spinal cord**

**E -> Responds to stimulus**

**Q. (a) Draw the structure of a neuron and label the following on it Nucleus, Dendrite, Cell body and Axon.**

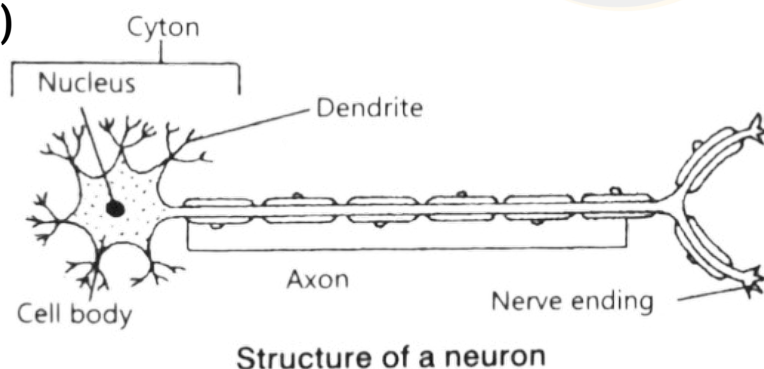
**[CBSE 2013]**

**(b) Name the part of neuron**

**(i) Where information is acquired.**

**(ii) Through which information travels as an electrical impulse.**

**Ans. (a)**



**(b) (i) Dendrite (ii) Axon.**



/padhleakshay



# Multiple Choice Questions

**SCAN  
& DONATE**



padhleakshay@apl



**1. In multicellular organisms, control and coordination activities are performed by**

- (a) Movements
- (b) Physio-chemical reactions
- (c) Specialised tissues
- (d) Glycogen

**2. Growth-related movements are known as**

- (a) Tropic movements
- (b) Nastic movements
- (c) Directional movements
- (d) Both (a) and (c)

**3. The other name of movements independent of growth is**

- (a) Nastic movements
- (b) Non-directional
- (c) Tropic
- (d) Both (a) and (b)

**4. Plant cells change shape by**

- (a) Breaking down food
- (b) Changing amount of water
- (c) Specialised proteins
- (d) Discharging waste products

**5. Directional movements can be**

- (a) Towards stimulus
- (b) Away from stimulus
- (c) Either of the above
- (d) Towards sun/root/etc.



**6. The role of roots and shoots in Geotropic movements is as follows**

- (a) Roots-positive shoots-negative
- (b) Roots no role shoots-positive
- (c) Roots-negative shoots-positive
- (d) None

**7. Growth of pollen tubes towards ovules is an example of**

- (a) Geotropism
- (b) Chemotropism
- (c) Hydrotropism
- (d) Phototropism

**8. In case of a tendril, hormone stimulates growth is**

- (a) Auxin
- (b) Cytokinins
- (c) Abscissic acid
- (d) Gibberellins

**9. Auxin, in tendrils is synthesized at**

- (a) Shoot tip
- (b) Leaves
- (c) Root tip
- (d) Stem

**10. Cytokinins are mostly present in**

- (a) Fruits
- (b) Flowers
- (c) Seeds
- (d) Fruits and seeds

**11. Plant hormone which inhibits growth is**

- (a) Auxin
- (b) Gibberellins
- (c) Cytokinins
- (d) Abscissic acid

**12. Coordination in animals is provided by**

- (a) Nervous tissue
- (b) Muscular tissue
- (c) Both (a) and (b)
- (d) None of the above

**13. Receptors are specialised parts of**

- (a) Muscle cells
- (b) Glands
- (c) Sense organs
- (d) Nerve cells

**14. Receptors are located in**

- (a) tongue
- (b) inner ear
- (c) nose
- (d) All of these

**15. Photoreceptors and phonoreceptors respectively detect**

- (a) Smell and taste
- (b) Sound and smell
- (c) Taste and sight
- (d) Sight and sound

**16. Transfer of chemical information from one neuron to another is facilitated by**

- (a) Synapse
- (b) Nerve ending
- (c) Axon
- (d) Cell body



**17. A connection where nerves which detect heat/sight etc. to nerves that move muscles is called**

- (a) Reflex arc
- (b) Human Brain
- (c) Neuromuscular junction
- (d) Reflex action

**18. Input and output nerves meet at**

- (a) Brain
- (b) Spinal cord
- (c) Muscles
- (d) Heart

**19. The function of sensory nerve is to carry**

- (a) Message to spinal cord
- (b) Spinal cord and nerves
- (c) Detect heat/light
- (d) Bones and nerves

**20. Central nervous system constitutes**

- (a) Brain & spinal cord
- (b) Spinal Cord and nerves
- (c) Relay neuron & brain
- (d) Bones and nerves

**21. Peripheral nervous system constitutes:**

- (a) Neurons & cranial nerves
- (b) Cranial & spinal nerves
- (c) Backbone & brain
- (d) Neurons & brain

**22. Brain is contained in a bony box consisting of a fluid filled balloon for**

- (a) Sending information
- (b) Protection of nerves
- (c) Connection with spinal cord
- (d) Shock absorption

**23. Animal cells change shape by**

- (a) Controlling the amount of water
- (b) Specialised proteins
- (c) Nerve impulse
- (d) Order from brain



# ANSWERS

1.-- c  
2.-- a  
3.-- a  
4.-- b  
5.-- c  
6.-- a  
7.-- b  
8.-- b  
9.-- a  
10.-d

11.-- d  
12.-- a  
13.-- d  
14.-- d  
15.-- d  
16.-- c  
17.-- c  
18.-- b  
19.-- a  
20.-- a

21.-- b  
22.--d  
23.--a



watch animated lecture at: [padhleakshay.com](https://padhleakshay.com)





 /padhleakshay



# Case-Based Questions

**SCAN  
& DONATE**



padhleakshay@apl

**Read the case/passage and answer the questions given below.**

**Question 1:**

**hands have to pick it up and take it to the mouth where it will be chewed. All these actions have to be coordinated in such a manner that they follow a particular sequence and the action is completed. A similar mechanism is also needed for internal functions of the body. This function is carried out by the nervous system. It is composed of**

**(a) Specialised cells which can detect, receive and transmit different kinds of stimuli. These are called neurons.**

**(b) Nerve fibres which are certain bundles of extended processes of nerve cells.**

**The individuals also have to adjust to the changing conditions around them and vary their responses. At the same time, the internal conditions of the body should be maintained constant. This is called homeostasis. The internal conditions of the body are maintained at a constant by controlling the physiology of the organisms.**

**(i) What will the correct sequence in which conduction of information through nerves take place?**

**(ii) How homeostasis is said to maintain the equilibrium of the body?**

**(iii) What function does the central nervous system perform?**

**(iv) What happens when the dendrite tip of a nerve cell receives a signal?**

## **ANSWERS**

**(i) Dendrites → Cell body → Axon → Nerve endings at the tip of axon → Synapse → Dendrite of next neuron**

**(ii) Homeostasis helps in keeping the constant internal environment within a cell or a body and hence maintains the equilibrium of the body.**

**(iii) The central nervous system is comprised of the brain and the spinal cord which process the information received from the receptors on/in the body.**

**(iv) Upon receiving a signal, the dendrite tip of a nerve cell sets off a chemical reaction which creates an electrical impulse in the them.**

## Question 2:

All the living organisms (plants and animals) respond and react to changes in the environment around them. The changes in the environment to which the organisms respond and react are called stimuli (singular of stimuli is stimulus). The living organisms show response to stimuli such as light, heat, cold, sound, smell, taste, touch, pressure, pain, water, and force of gravity, etc. The response of organisms to a stimulus is usually in the form of some movement of their body part. For example, if a man touches a very hot utensil accidentally, he quickly pulls his hand away from the hot utensil. Here, heat is the stimulus and the man reacts by moving his hand away from the hot utensil. Similarly, when the sun is bright, we close our eyes. In this case, light is the stimulus and we react by closing the eyes.

i. The changes in the environment to which the organisms respond and react are called stimuli. State true or false.

- (a) TRUE
- (b) FALSE

ii. The response to stimuli is a characteristic property of the \_\_\_\_\_ organisms.

- (a) Non-living
- (b) Living

iii. The animals can react to stimuli in many \_\_\_\_\_ ways.

- (a) Different
- (b) Limited

iv. The plants react to stimuli in a \_\_\_\_\_ way.

- (a) Different
- (b) Limited

v. State true or false. The working together of the various organs of an organism in a systematic manner so as to produce a proper response to the stimulus, is called coordination.

- (a) TRUE
- (b) FALSE

## ANSWERS

- i. TRUE
- ii. Living
- iii. Different
- iv. Living
- v. TRUE