

CHAPTER -1

Sensations and Responses.

1) What are stimuli ?

Ans) The senses that evoke responses in organisms are called stimuli.

2) Give two examples for internal stimuli..

ans) Hunger and thirst .

3) What are receptors ?

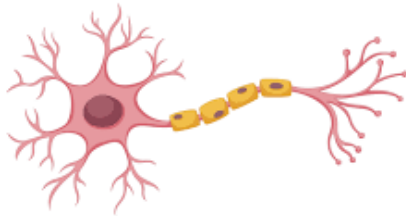
Ans) Receptors are specialized cells in the sense organs and other parts of the body to receive stimuli.

4) -----is the basic structural unit of the nervous system.

Ans) Neuron (nerve cell)

5) Illustrate the structure of neuron.

Ans)



6) Write the peculiarities and functions of each part of a neuron .

Ans) **a) Dendrite :**

Branches of dendron.It is the part that receives impulses from adjacent neuron.

b) Dendron :

Short filament from the cell body .It carries impulses from dendrites to the cell body.

c) Schwann cell :

It encircles the axon .

d) Axon :

Longest filament from the cell body. It carries impulses from the cell body to outside.

e) Axonite :

Branches of axon. It carries impulses to the synaptic knob.

f) Synaptic knob : Tip of axonite .It Secretes neurotransmitter.

7) What is myelin sheath? Write its functions .

Ans) Axons of most of the neurons are repeatedly encircled by myelin, a membrane containing lipid. This is called myelin sheath.

The major functions of myelin sheath are as follows;

i) Provides oxygen and nutrients to the axon.

ii) It accelerates impulses .

iii) Act as an electric insulator and protect the axon from external shocks .

8) Define grey matter and white matter .

Ans) The myelin sheath has a shiny white colour . The part of the brain and spinal cord where myelinated neurons are present in abundance is called white matter and the part where non -myelinated neurons are present is called grey matter .

9) How is myelin sheath in central nervous system and peripheral nervous system different from each other ?

Ans) Myelin sheath in peripheral nervous system is formed of schwann cells. But myelin sheath in central nervous system is formed of specialized cells known as oligodendrocytes ..

10) Name the charges seen on either side of the plasma membrane .

Ans) The outer surface of the plasma membrane is positively charged and inner surface is negatively charged .

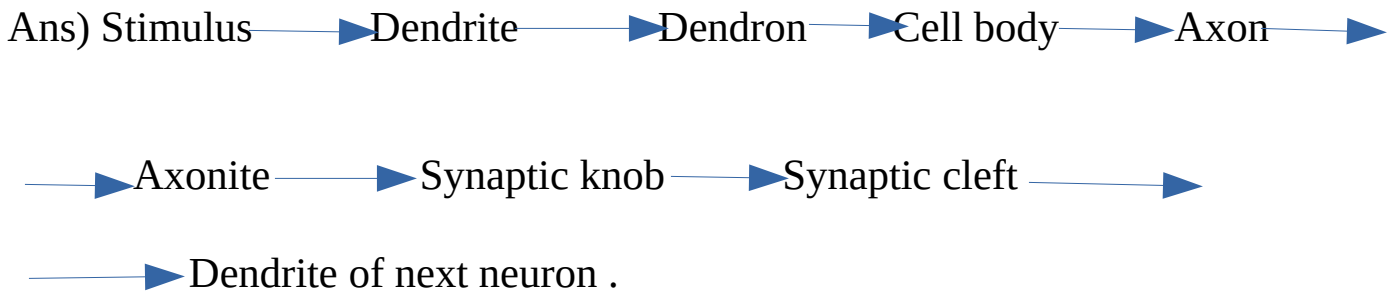
11) Why is there a difference in charge distribution on either side of the plasma membrane ?

Ans) Due to the difference in the distribution of ions .

12) What changes do the stimulus create in the charges on either side of the plasma membrane ? How do these charges get transmitted through the axon as impulses ?

Ans) When stimulated , in that particular part , the outer surface of the plasma membrane becomes negatively charged while the inner surface becomes positively charged . The momentary charge difference stimulates its adjacent parts and similar changes occur there also. Thus impulse get transmitted through axon .

13) Write a flow chart showing the transmission of impulses from one neuron to another .



14) What is synapse ? Write its functions?

Ans) Synapse is the junction between two neurons or a neuron and a muscle cell or a neuron and a glandular cell.
Synapse helps to regulate the speed and direction of impulses .

15) What are neurotransmitters ? Write its importance ? Give two examples for neurotransmitters .

Ans) When the electric impulses reach the synaptic knob, certain chemical substances are secreted from there to the synaptic cleft. These chemicals are known as neurotransmitters.
They stimulates the adjacent dendrite and new electric impulses are generated .
Eg: Acetyl choline and Dopamine ..

16) What are nerves ? What are the three types of nerves ? Write their peculiarities and functions ?

Ans) Nerve is a group of axons or nerve fibres . They are covered by connective tissue .
Three types of nerves are as follows ;

a) Sensory nerve :

They are formed of sensory nerve fibres . It carries impulses from various parts of the body to the brain and the spinal cord.

b) Motor nerve :

They are formed of motor nerve fibres . It carries impulses from brain and spinal cord to various parts of the body.

c) Mixed nerve :

They are formed of sensory nerve fibres and motor nerve fibres . It carries impulses to and from the brain and spinalcord

17) What are the two parts of the nervous system ? Explain .

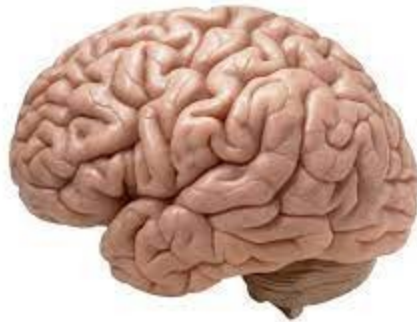
Ans) The two parts of the nervous system are ;

i)Central nervous system and ii) Peripheral nervous system.

Central nervous system consist of brain and spinal cord .

Peripheral nervous system consist of cranial nerves (12pairs) and spinal nerves (31pairs).

18) Draw the structure of human brain.



19) What are the different parts of brain ? Write their function.

Ans) **a) Cerebrum :**

- * Biggest part of the brain.
- * Centre of thought, memory, intelligence and imagination.
- * Evoke sensations .
- * Control voluntary movements.

b) Cerebellum:

- * The second largest part of the brain.
- * Co ordinates muscular activities and maintains equilibrium of the body.

c) Medulla oblongata :

- * Controls involuntary activities such as heart beat and breathing.

d) Thalamus :

- * Acts as relay station of impulses to and from the cerebrum
- * Analyses impulses from various parts of the body and send the important ones to the cerebrum.

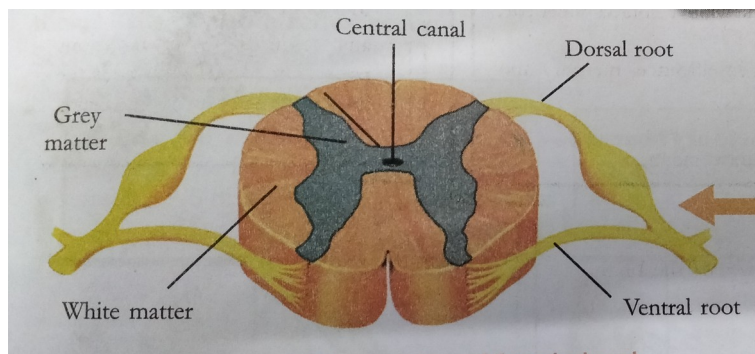
e) Hypothalamus :

- * Situated just below thalamus.
- * Plays a major role in the maintenance of homeostasis.

20) How is brain protected ?

Ans) The brain is protected inside the skull. It is covered by the meninges, a three layered membrane. The cerebrospinal fluid (CSF) is filled within the inner membranes of meninges and the ventricles of the brain.

21) Illustrate the cross section of the spinal cord and label the parts ..
ans)



22) How is the spinal cord protected ?

Ans) The spinal cord is protected inside the vertebral column. Spinal cord is covered by meninges. The central canal is filled with cerebrospinal fluid.

23) How is dorsal root different from ventral root ?

Ans) Sensory impulses reach the spinal cord through the dorsal root. Motor impulses go out of the spinal cord through the ventral root.

24) What is the function of spinal cord ?

Ans) Impulses from different parts of the body are transmitted to and from the brain through the spinal cord. It also coordinates the repeated movements during walking, running ...etc

25) How is spinal nerve formed ?

Ans) A dorsal root and a ventral root join to form a spinal nerve .

26) Define reflex action .

Ans) The accidental and involuntary responses towards stimuli are called reflex actions .

27) Name two types of reflex actions and give examples for each ..

ans) a) Cerebral reflex – Reflexes under the control of the cerebrum .

Eg: Blinking of eye when light suddenly falls on our eyes .

b) Spinal reflex – Reflexes under the control of the spinal cord are called spinal reflexes..

Eg : Withdrawal of hand while touching a hot object unknowingly..

28) What is reflex arc ?

Ans) The path way of impulses during reflex action are called reflex arc .

29) Write a flow chart showing reflex arc ..

ans) Stimulus → Receptor → Sensory neuron → Inter neuron →
→ Motor neuron → Related muscle..

30) Write short notes on autonomous nervous system.

Ans) Activities that take place beyond the conscious level are controlled by the autonomous nervous system , a part of the peripheral nervous system. The sympathetic system and the parasympathetic system together form the autonomous nervous system..

31) Tabulate the activities of sympathetic and parasympathetic nervous system..

Organ/Part	Action of sympathetic system	Action of parasympathetic system
Pupil	Dilates	Contracts.
Salivary gland	Production of saliva decreases	Production of saliva increases
Trachea	Expands	Contracts
Heart	Heart beat increases	Heart beat becomes normal

Stomach	Gastric activities slow down	Gastric activities become normal
Liver	Glycogen converted into glucose	Glucose is converted into glycogen
Intestine	Peristalsis in the intestine slows down	Peristalsis in the intestine becomes normal
Urinary bladder	Urinary bladder regains normal state	Urinary bladder contracts

32) Tabulate various nervous disorders ,their causes and symptoms..
ans)

Diseases	Causes	Symptoms
Alzheimer's	Accumulation of insoluble protein in the neural tissue of the brain .Neuron get destroyed	Loss of memory ,, inability to recognize friends and relatives,inability to do routine works
Parkinsons	Destruction of specialized ganglions in the brain.Production of dopamine gets reduced	Loss of body balance,irregular movement of muscles,shivering,profuse salivation
Epilepsy	Continuous and irregular flow of electric charges in the brain	Epilepsy due to continuous muscular contraction,frothy discharge from the mouth,clenching of teeth,following which the patient falls unconscious

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