MULTIPLE CHOICE QUESTIONS

1. Chemicals which are released at the synaptic junction are called
a. Hormones
b. Neurotransmitters
c. Cerebrospinal fluid
d. Lymph
Solution:
Option (b) is the answer.

2. The potential difference across the resting membrane is negative. This is due to the differential distribution of the following ions
. Na^+ and K^+
b. CO_3^{++} and CI
c. Ca^{++} and Mg^{++}
d. Ca^{++} and CI
Solution:
Option (a) is the answer.

3. Resting membrane potential is maintained by
a. Hormones
b. Neurotransmitters
c. Ion pump
d. None of the above
Solution:
Option (c) is the answer.

4. The function of our visceral organs is controlled by
a. Sympathetic and somatic neural system
b. Sympathetic and parasympathetic neural system
c. Central and somatic nervous system
d. None of the above
Solution:
Option (b) is the answer.

5. Which of the following is not involved in Knee-jerk reflex?
a. Muscle spindle
b. Motor neuron
c. Brain
d. Interneurons
Solution:
Option (c) is the answer.

6. An area in the brain which is associated with strong emotions is
a. Cerebral cortex
b. Cerebellum

c. Limbic system
d. Medulla
Solution:
Option (c) is the answer.

7. Mark the vitamin present in Rhodopsin
a. Vit A
b. Vit B
c. Vit C
d. Vit D
Solution:
Option (a) is the answer.

8. Human eyeball consists of three layers and it encloses
a. Lens, iris, optic nerve
b. Lens, aqueous humour and vitreous humour
c. Cornea, lens, iris
d. Cornea, lens, optic nerve
Solution:
Option (b) is the answer.

9. Wax secreting gland present in the ear canal is called
a. Sweat gland
b. Prostate gland
c. Cowper's gland
d. Ceruminous gland
Solution:
Option (d) is the answer.

10. The part of the internal ear responsible for hearing is
a. Cochlea
b. Semicircular canal
c. Utriculus
d. Sacculus
Solution:
Option (a) is the answer.

11. The organ of Corti is a structure present in
a. External ear
b. Middle ear
c. Semicircular canal
d. Cochlea
Solution:
Option (d) is the answer.

VERY SHORT ANSWER QUESTIONS

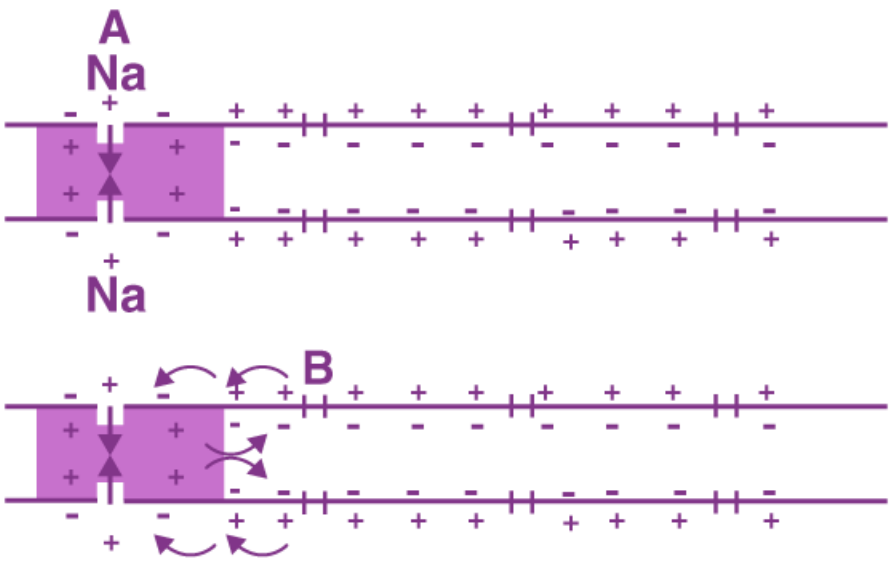
1. Rearrange the following in the correct order of involvement in electrical impulse movementSynaptic knob, dendrites, cell body, Axon terminal, Axon
Solution:
The correct order of involvement of the given parts of neuron in electrical impulse is-
Dendrites → Cell body → Axon → Axon terminal → Synaptic knob

2. Comment upon the role of ear in maintaining the balance of the body and posture.
Solution:
Maintaining the balance of the body and posture is done by the inner ear. There are two parts which are semicircular canals and vestibules are involved in the balancing.

3. Which cells of the retina enable us to see coloured objects around us?
Solution:
The cone cells present inside the retina enable us to see coloured objects around us.

4. Arrange the following in the order of reception and transmission of a sound wave from the eardrum: Cochlear nerve, external auditory canal, eardrum, stapes, incus, malleus, and cochlea.
Solution:
The order of reception and transmission of the sound wave from the eardrum is –
Ear Drum → Malleus → Incus → Stapes → Cochlear → Cochlear nerve

5. During resting potential, the axonal membrane is polarized, indicate the movement of +ve and –ve ions leading to polarisation diagrammatically.
Solution:



Diagrammatic representation of impulse conduction through an axon (at points A and B)

6. Name the structures involved in the protection of the brain.

Solution:
The human brain is protected by the skull. Inside the skull, there are cranial meninges that cover the brain. The cranial meninges are made up of three layers, namely – Dura mater (outer layer), Arachnoid (middle layer) and Pia mater (inner layer which is in contact with the brain). Dura mater is the thick, tough, fibrous membrane. Arachnoid is a membrane with a spider-like structure. The parameter is a very thin, delicate and vascular membrane. The space between dura mater and arachnoid is called subdural space. The space between arachnoid and parameter is called subarachnoid space. It is filled cerebrospinal fluid which acts as a cushion for CNS from shock.

7. Our reaction like aggressive behaviour, use of abusive words, restlessness etc. are regulated by the brain, name the parts involved
Solution:
The limbic system (the inner part of the cerebral hemisphere and a group of associated deep structures) and hypothalamus (a small region located at the base of the brain near the pituitary gland)

8. What do grey and white matter in the brain represent?
Solution:
Grey matter – The cerebral cortex is referred to as Grey matter due to its greyish appearance
White matter – Fibres of the tract are covered with a myelin sheath.

9. Where is the hunger centre located in the human brain?
Solution:
The hunger centre is located in hypothalamus in the human brain.

10. Which sensory organ is involved in vertigo (sensation of oneself or objects spinning around)?
Solution:
The vestibular system of the inner ear is associated with vertigo.

11. While travelling at a higher altitude, a person complains of dizziness and vomiting sensation. Which part of the inner ear is disturbed during the journey?
Solution:
Vestibular apparatus (saccule, utricle and semicircular canals)

12. Complete the statement by choosing appropriate match among the following –

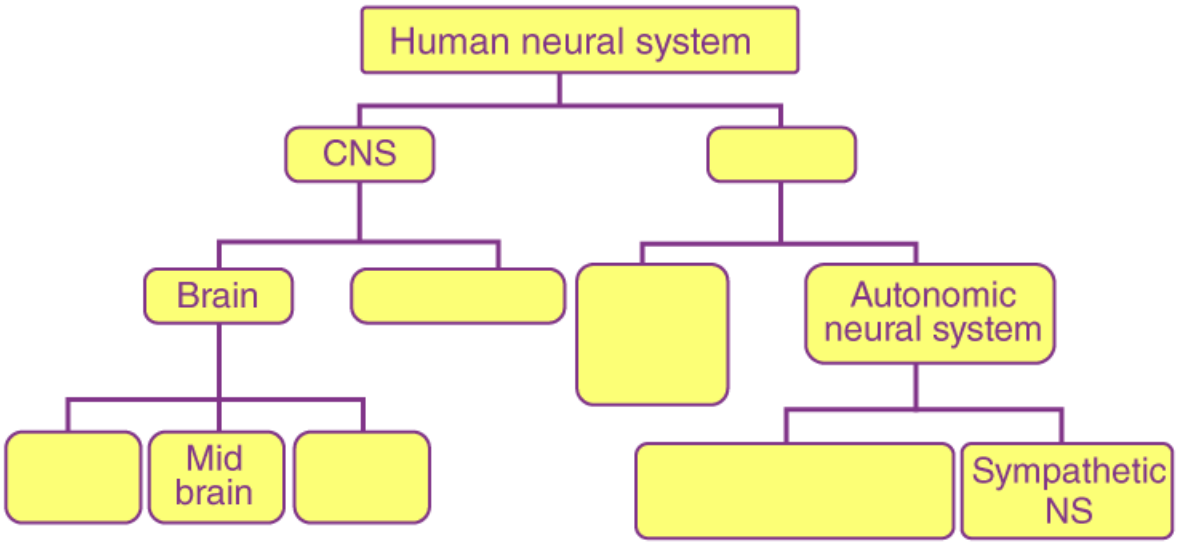
a. Resting potential.	**i. chemicals involved in the transmission of impulses at synapses.**
b. Nerve impulse	**ii. the gap between the presynaptic and post synaptic neurons**
c. Synaptic cleft	**iii. the electrical potential difference across the resting neural membrane**
d. Neurotransmitters	**iv. an electrical wave-like the response of a neuron to a stimulation.**

Solution:
a – iii

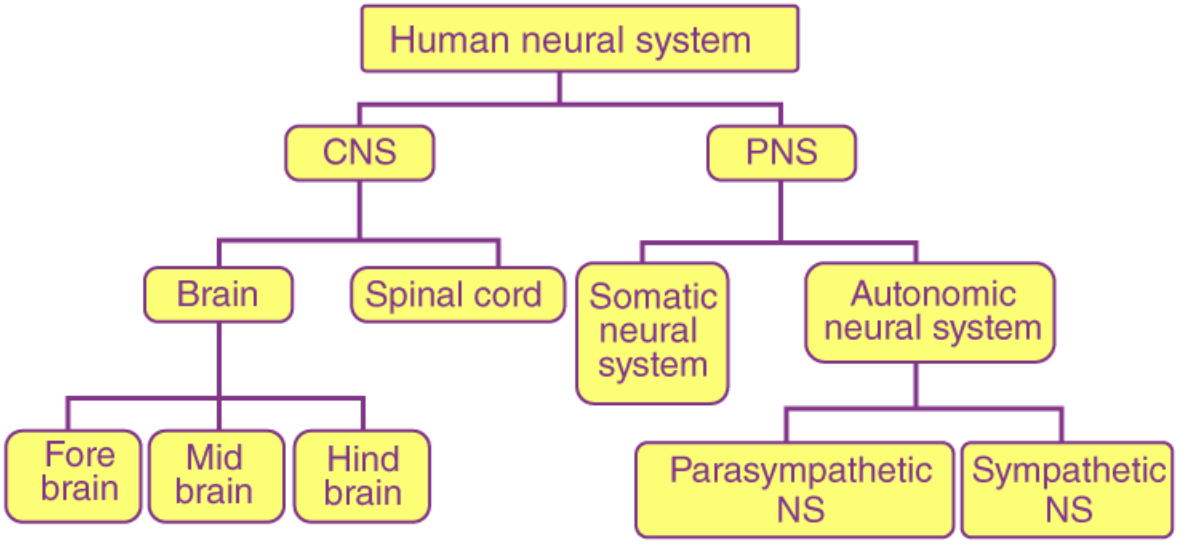
b – iv
c – ii
d – i

SHORT ANSWER TYPE QUESTIONS

1. The major parts of the human neural system are depicted below. Fill in the empty boxes with appropriate words.



Solution;



2. What is the difference between electrical transmission and chemical transmission?
Solution:
Electrical transmission occurs at the electrical synapse and this will be the faster transmission. Electric current transfers directly from one neuron are in very close proximity. In chemical transmission, the transmission will be slower and occurs at a chemical synapse. The neurotransmitters are involved in the transmission of impulses at the synapses.

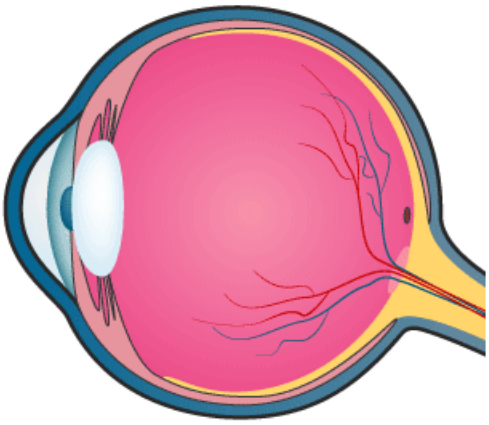
3. Neural system and computers share certain common features. Comment in five lines. (Hint: CPU, input-output devices).
Solution:
1. In computers, the input devices are mouse and keyboard while in the neural system, the sensory neurons act as input devices which take inputs from the environment.
2. The message from input devices is sent to the brain in a neural system and the CPU in computers.
3. The brain processes the information from the input devices whereas the CPU processes the information and gives the command to the output device.

4. If someone receives a blow on the back of the neck, what would be the effect on the person's CNS?
Solution:
If someone receives a blow on the back of the neck, it may lead to the dislocation of cervical vertebrae (located right below the skull).

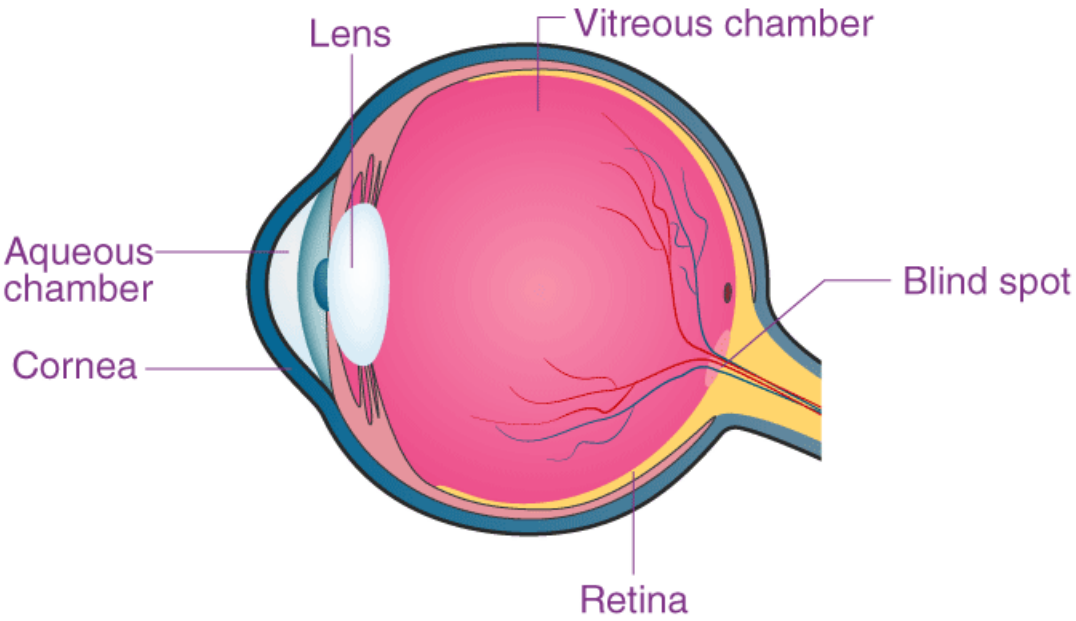
5. What is the function ascribed to Eustachian tube?
Solution:
It helps in equalizing the pressure on either side of the eardrum. It is the tube connects the middle ear cavity with the pharynx.

6. Label the following parts in the given diagram using the arrow

Aqueous chamber
Cornea
Lens
Retina
Vitreous chamber
Blind spot

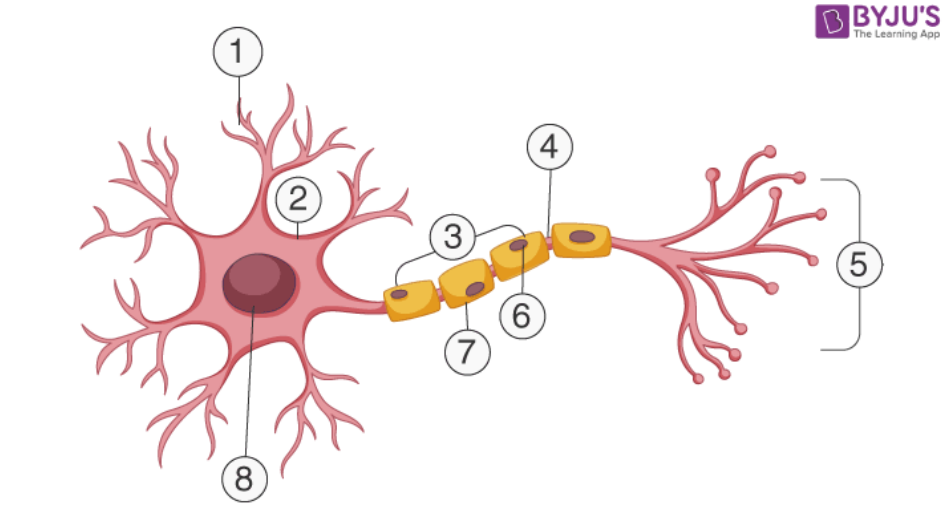


Solution:

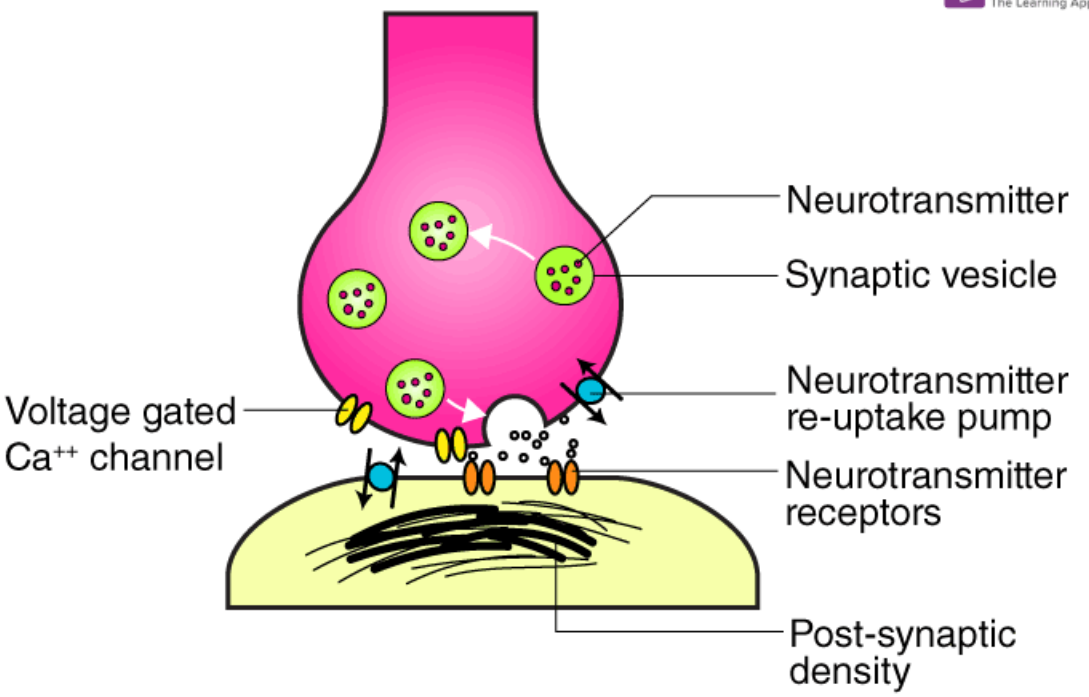


LONG ANSWER TYPE QUESTIONS

1. Explain the process of the transport and release of a neurotransmitter with the help of a labelled diagram showing a complete neuron, axon terminal and synapse.
Solution:



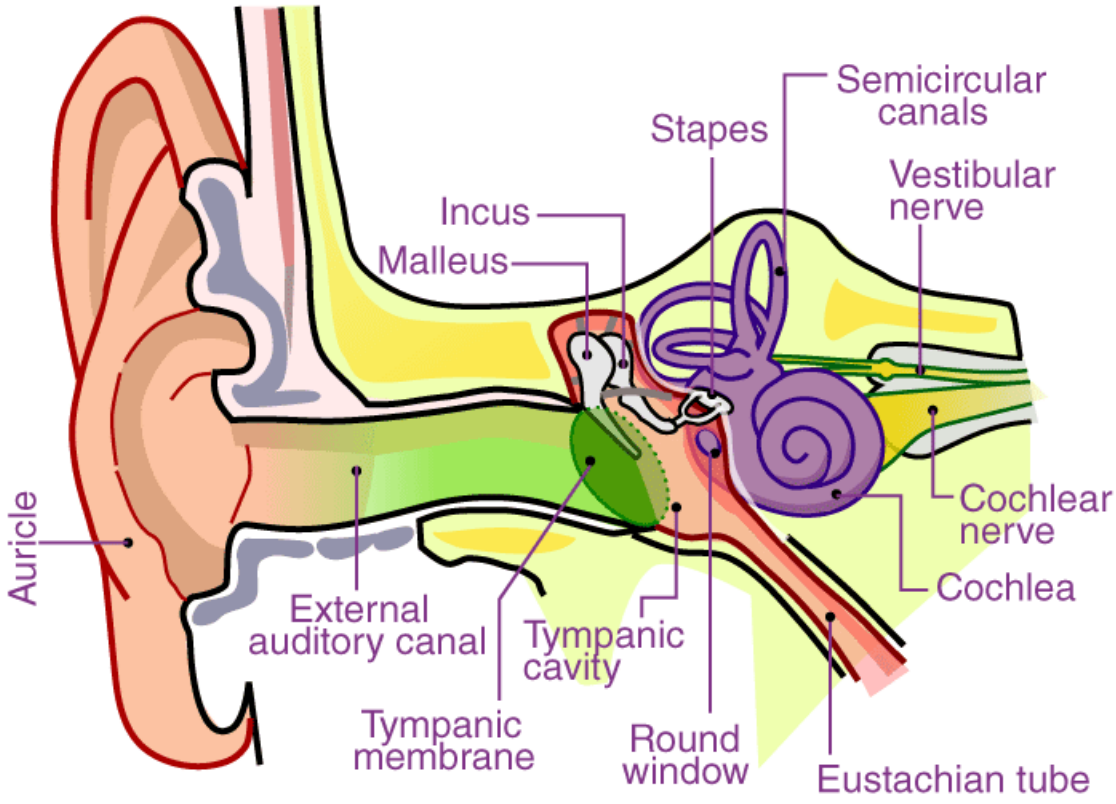
1 Dendrite | 2 Soma | 3 Axon | 4 Node of Ranvier
5 Axon Terminal | 6 Schwann Cell | 7 Myelin Sheath | 8 Nucleus



Any nerve impulse is passed from one neuron to another neuron via the axon. Transport and release of a neurotransmitter occur within a synapse. At a chemical synapse, the membranes of the pre- and post-synaptic neurons are separated by a fluid-filled space called the synaptic cleft. At these synapses, chemicals called transmitters are involved in the transmission of impulses.

2. Name the parts of human forebrain indicating their respective functions.
Solution:
Cerebrum - It is further divided into 4 lobes:
a. Frontal lobe - associated with parts of speech, reasoning, planning, problem-solving and movement.
b. Parietal lobe - Helps in movement, perception of stimuli and orientation.
c. Occipital lobe - Visual processing
d. Temporal lobe – memory and speech.
Thalamus- It is a small structure located right above the brain stem. It helps in the sensory information from the sense organs. It is found in the limbic system within the cerebrum.
Hypothalamus - The hypothalamus is a small and important part of the brain, located exactly below the thalamus. It controls the mood and emotions and synthesis body's essential hormones.

3. Explain the structure of the middle and internal ear with the help of a diagram.
Solution:



The middle ear contains three ossicles which are arranged in a chain fashion called the malleus, incus and stapes
The malleus is attached to the tympanic membrane and the stapes is attached to the oval window of the cochlea. A Eustachian tube connects the middle ear cavity with the pharynx and helps in equalizing the pressures on either side of the eardrum.
The inner ear is also called labyrinth which is fluid-filled and has two parts, the bony and the membranous labyrinth. Former is the series of channels inside this membranous labyrinth is present and

surrounded by a fluid called perilymph. The membranous labyrinth is filled with a fluid called endolymph. The coiled portion of the labyrinth is called the cochlea. Endolymph is filled in scala media. At the base of the cochlea, the scala vestibule ends at the oval window, while the scala tympani terminate at the round window which opens to the middle ear.