

Topic :- Neural Control & Coordination

- 1 (c)
In myelinated nerve fibre, the myelin sheath is not continuous and remains interrupted at some places. These are known as nodes of Ranvier. These help in the saltatory conduction of nerve impulse. The non-myelinated nerve fibres do not possess nodes of Ranvier.
- 2 (b)
Covering of muscle cells is known as sarcolemma. Neurons are the fundamental units of nervous system. Each neuron has the following basic parts:
1.The cell body or cyton
2.Dendrons
3.Axon
- 3 (d)
A conditioned reflex is a response acquired by an animal during its own life by association of a new sensory stimulus (say bell) with an inborn response (salivation)
- 4 (b)
The neural organization is very simple in lower invertebrates. It is better organized in insects and more developed in vertebrates
- 5 (c)
Jacobson's organ is an auxiliary olfactory sense organ that is found in many animals. In mammals, the sensory neurons of Jacobson's organ detect specific chemical compounds contained within scents that are often but not always, large non-volatile molecules. It is well developed in snakes and lizard.
- 6 (d)
The nervous system is composed of neurons (nerve cells), which exercise control by sending electrical signals called nerve impulse. The nervous control is speedy and flexible but its effect is localized. A neuron may transmit impulse as fast as 150 impulse
- 7 (c)
Synapse is a site of junction between axon of one neuron and dendrites of another neuron. Each neuron receives an impulse through its dendrites and passes it on to the next neuron through synapse
- 8 (b)

The ciliary muscles are smooth muscles are of circular and meridional type. These muscles alter the shape and lens during accommodation. **Suspensory ligaments** are attached to the ciliary body, which in turn are attached to the capsule that surrounds the lens of the eye. Due to the action of the muscles of the ciliary body and suspensory ligament, the focal length of the lens can be changed. Then, the objects can be focussed in different intensity of light from varying distances

9

(d)

Pupil is the central perforation of iris. Its size is controlled by the contraction of radial (dilates pupil) and circular (constricts pupil) muscles of iris in response to dim and strong light respectively. Both of these muscles are under control of autonomic nervous systems.

10

(d)

There are two types of synapses namely electrical synapses and chemical synapses. At electrical synapses, the membrane of pre and post synaptic neuron are in very close proximity transmission of an impulse across electrical synapses is very similar to impulse conduction along a single axon

11

(c)

The rods bear a long with thin cylinder, each of which contains a purple pigment rhodopsin made of a protein and vitamin-A. light splits rhodopsin into a pigment retinene and a protein scotopsin (opsin). This process is called bleaching. This depolarizes the rod cells to release a neurotransmitter, transmitting the nerve impulse to the bipolar cells, ganglion cells and then to the optic nerve fibres. In night, light is received from the moon and stars. It is resynthesized from retinene and scotopsin by vitamin-A.

12

(b)

Non-myelinated nerve fibre is enclosed by a Schwann cell that do not form a myelin sheath around the axon

13

(a)

High concentration of K^+ and low concentration of N^+ inside the axon.

Both A and R true and R is the correct explanation of A.

When a neuron is not conducting any impulse, *i.e.*, resting, the axonal membrane is comparatively more permeable to potassium ions (K^+) and nearly impermeable to sodium ions (Na^+). Similarly, the membrane is impermeable to negatively charged proteins present in the axoplasm. Consequently, the axoplasm inside the axon contains high concentration of K^+ and negatively charged proteins and low concentration of Na^+ . In contrast, the fluid outside the axon contains a low concentration of K^+ , a high concentration of Na^+ and thus form a concentration gradient

14

(a)

The fluid-filled inner ear called **labyrinth** consists of two parts, the bony and the membranous labyrinth. The bony labyrinth is a series of channels. Inside these channels lies the membranous labyrinth, which is surrounded by a fluid called perilymph. The membranous labyrinth is filled with a fluid called endolymph. The coiled portion of the

labyrinth is called **cochlea**.

The membranes constituting cochlea, the Reissner's and basilar, divide the surrounding perilymph filled bony labyrinth into an upper scala vestibule and a lower scala tympani.

The space within cochlea called scala media is filled with endolymph.

At the base of the cochlea, the scala vestibuli ends at the oval window, while the scala tympani terminates at the round window which opens to the middle ear

15 **(b)**

When a nerve fibre is stimulated, its membrane becomes more permeable to sodium ions, hence, more sodium ions enter the axon than potassium ions leaving it. As a result, the positive and negative charges on the outside and inside of the membrane are reversed. The membrane with reversed polarity is called depolarized.

16 **(b)**

Nissl's granules are found in both cell body and dendrites

17 **(d)**

There are two types of axons-myelinated and non-myelinated. The myelinated nerve fibres are enveloped with Schwann cells, which form a myelin sheath around the axon. The gaps between two adjacent myelin sheaths are called nodes of Ranvier. Myelinated nerve fibres are found in spinal and cranial nerves.

Non-myelinated nerve fibre is enclosed by a Schwann cell that does not form a myelin sheath around the axon, and is commonly found in autonomous and the somatic neural systems.

18 **(c)**

The brain is the central information processing organ of our body

19 **(d)**

I, II and III.

Both (a) and (b), *i.e.*, cones and rods

20 **(c)**

During synaptic excitation, the postsynaptic cell depolarizes. Epsps are graded in intensity and can summate.

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	C	B	D	B	C	D	C	B	D	D
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	B	A	A	B	B	D	C	D	C