

Topic :- Neural Control & Coordination

- 1 **(b)**
The intraocular pressure is about 10-15 mm Hg ($\sim\alpha$ kPa). The pupils constrict when the eye focuses on a near object. The aqueous humour is secreted by the ciliary bodies and differs in composition from the plasma.
- 2 **(d)**
Organ of Corti present in cochlea of internal ear, transduce the sound and the information is then passed onto the brain through eighth cranial nerve.
- 3 **(d)**
Sympathetic nervous system (SNS) is the autonomous nervous system with adrenergic nerve fibres, which release 'adrenaline'. It increases the functioning of visceral organs. It increases heart beat, respiration, dilates the pupil, rises blood pressure, etc.
It controls the secretion of adrenaline by adrenal medulla, functions as emergency hormone. It induces **fight, flight and fright reactions**.
Watching a horror movie or under stress conditions, sympathetic nervous system is activated secreting adrenaline. It causes high heart beat, high respiration and inhibits the salivation and secretion from digestive glands making mouth dry.
- 4 **(b)**
When a nerve stimulus reaches the end of one neuron, acetylcholine, a neurotransmitter is released from the synaptic vesicles of the neuron. This neurotransmitter helps in conducting the nerve stimulus to the adjacent neuron.
- 5 **(c)**
The reflex pathway comprises at least one afferent neuron, *i.e.*, receptor and one efferent (effector or excitor) neuron appropriately arranged in a series
- 6 **(d)**
The plasma membrane of neuron is polarized due to difference in the concentration of positive ions across it. This difference is actively maintained by Na^+/K^+ pump. When any deflection in this condition happens, it can be easily detected by plasma membrane it and further transmitted to other neurons
- 7 **(a)**
Velocity=metre per second,
Therefore, time taken=distance \div velocity

8 **(c)**
Midbrain is located between the thalamus/hypothalamus of the forebrain and pons of the hindbrain. A canal, called the cerebral aqueduct passess through the midbrain. The dorsal portion of the midbrain consists of four round swellings (lobes) called corpora quadrigemina

9 **(d)**
Synaptic cleft.
One nerve fibre is attached to another nerve fibre *via* a junction called synapse. It is not a tight junction. A synapse is formed by the membrane of a presynaptic neuron and postsynaptic neuron, which may or may not is separated by a gap called synaptic cleft, *i.e.*, axon of one neuron end on the dendrite of next neuron

10 **(b)**
Valve of Vieussens joined corpora quadrigemina (four-optic lobes) of mammalian brain with the cerebellum.

11 **(a)**
Neural system is an organ system. So, it must follow the flow of development of organ system in an organism. In case of lower organism, each kind of organization is simple. So, neural organization must be simple

12 **(a)**
Movement of the nerve impulse across synaptic cleft is primarily a chemical event mediated by neurotransmitters such as acetylcholine (Acl.), gamma-amino butyric acid (GABA), nor-epinephrine and serotonin.

13 **(a)**
When a stimulus is applied, sodium potassium pump stop operating. Sodium ions rush inside and potassium ions rush outside. This results in depolarization (action potential). After a period of action potential sodium potassium pump operate (efflux of Na^+ and influxes of K^+) and axon will get resting potential by repolarization.

14 **(b)**
The spinal nerves passes out from vertebrae through intervertebral foramen. There are total 31 pairs of spinal nerves (8 cervial, 12 thoracic, 5 lumbar, 5 sacral and last one coccygeal) in human.

15 **(d)**
Neurons can be excited by the external stimuli. The stimuli creates an impulse that can be transmitted throughout the neuron and from one neuron to another neuron

16 **(a)**
Frontal lobe of brain controls intellutectual ability. **Parietal lobe** contains somesthetic area for general sensation and area of taste and speech. **Temporal lobe** is concerned with hearing and reading. **Occipital lobe contains** visual area for visual sensation.

17 **(a)**
In neurons, the restoration of resting potential is called repolarization. After

depolarization, with the increase of sodium ions inside the nerve fibre, the membrane becomes less permeable to Na^+ and more to K^+ . the Na^+ channels of axon membrane close and K^+ channels open. Na^+ influx stops and K^+ outflow starts until the original resting state of ionic concentration is achieved. Thus, resting potential is restored, which is called repolarization of the membrane. Until repolarization occurs, neuron cannot conduct another impulse. The time taken for this restoration is called refractory period.

18

(a)

The colour of eyes depends upon the presence of colour in iris (coloured membrane), *i.e.*, brown, black, green blue in albinos iris is deficient of pigment and the red colour of eyes is due to **colour of blood** flowing in blood vessels

19

(c)

Coordination is the process through, which two or more organs interact and complement the function of one another. The neural system provides an organized network of point to point connections for a quick coordination. But this system is short lived. As the nerve fibres do not innervate all cells of the body and the cellular functions need to be continuously regulated, a special kind of coordination and integration has to be provided. This function is carried out by hormones released by glands of endocrine system

20

(b)

There are two types of photoreceptor cells namely, rods and cones. These cells contains the light-sensitive proteins called the photopigments

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