CBSE TEST PAPER-02

CLASS - XI BIOLOGY

(Neural Control and Coordination)

General Instruction:

- All questions are compulsory.
- Question No. 1 to 3 carry one marks each. Question No. 4 to 6 carry two marks each. Question No. 7 and 8 carry three marks each. Question No. 9 carry five marks.

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1. Name the band of nerve fibers that joins the two cerebral hemisphere in mammals.

2. What is threshold stimulus for nerve cell?

3. What is a compound eye?

4. Give parts of neuron.

5. Describe the role & location of ciliary body in human eye.

6. What is mosaic vision?

7. Why do giant squids have very thick nerve fiber?

8. Where are synaptic vesicles found? Name their chemical contents? What is the function of these contents?

9. What is meant by the resting membrane potential of neuron. How do ion channels & sodium – potassium pumps contribute to the resting potential?

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[ANSWERS]

Ans 01. Corpus callosum.

Ans 02. The minimum intensity / strength of a stimulus required to initiate depolarization of neurone is called threshold stimulus.

Ans 03. In insects the eye is composed of many independent visual elements called ommatidia. Such an eye is called compound eye.

Ans 04. Neuron is a microscopic structure made up of 3 parts-

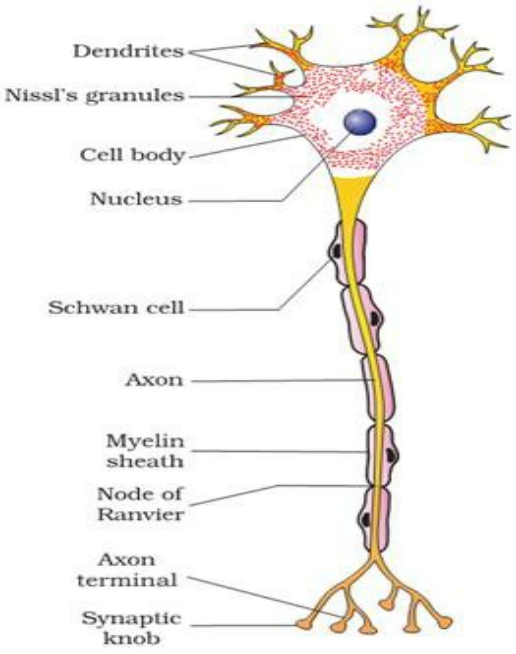

Figure 21.1 Structure of a neuron

a) Cell body – In contains cytoplasm with typical cell organelles and some granular bodies called Nissl granules.

b) Dendrites – The short fibers that branch repeatedly and project out of the cell body. They transmit impulse towards the cell body or cyton.

c) Axon – It is a long fibre. Its distal end is branched. Each branch terminates into bulb-like structures called as synoptic knob.

Ans 05. Location:- The ciliary body is a part of the eye that includes the ciliary muscle, which controls the shape of the lens, and the ciliary epithelium, which produces the aqueous humor. The ciliary body is part of the uvea, the layer of tissue that delivers oxygen and nutrients to the eye tissues.
Function: The ciliary body also contains the ciliary muscle. This muscle changes the shape of the lens when your eyes focus on some thing.

Ans 06. This type of vision is found in insects due to compound eye. A complete image of the object as seen by the compound eye is formed by a number of small lineages each of which is contributed by an ommatidium. Such an image formed by many bits of images is called a mosaic image and the vision as the mosaic vision.

Ans 07. The velocity of a nerve impulse in a nerve fiber depends on two factors i. e. on its myelinated covering and also on the thickness of the fibers. The impulses travel faster in thicker nerve fibers. Since giant squids are very large sized aquatic animals they have thick nerve fibers.

Ans 08. Synaptic vesicles are found in the bulb like expansions called synaptic knob, at the nerve terminals.
Each synaptic vesicle contains as many as 10,000 molecules of a neurotransmitter substance called acetyl choline that is responsible for transmission of nerve impulses across the synapse.
When a wave of depolarization reaches the presynaptic neuron membrane, the voltage gated calcium channels concentrated at the synapse open & Ca^{++} ions diffuse into the terminal form the surrounding fluid.
- The Ca^{++} ions stimulate the synaptic vesicles to move to the terminal membrane, fuse with it and then rupture by exocytosis into the cleft.
- This neurotrarmitter diffuses across the synapse and stimulates the membrane of the next neuron.

Ans 09. Resting membrane potential.
- The electrical potential difference across the membrane of a resting neuron is called resting

membrane potential.

- The membrane is polarized, with a negative interior and positively charged exterior.
- The permeability of membrane to K^+ ions is greater than its permeability to Na^+ ions.
- The negatively charged protein molecules can cross the membrane.
- The sodium pump transports 3 Na^+ ions to the exterior, while in exchange only 2K+ ions comes inside.
- Hence the surface carries a positive charge, which the interior is negatively charged.

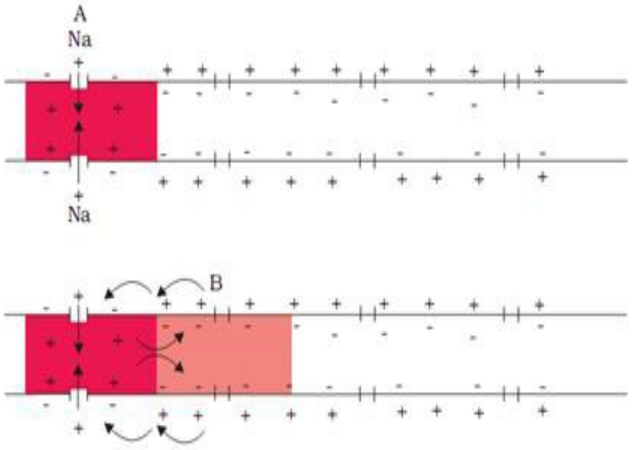

Figure 21.2 Diagrammatic representation of impulse conduction through an axon (at points A and B)