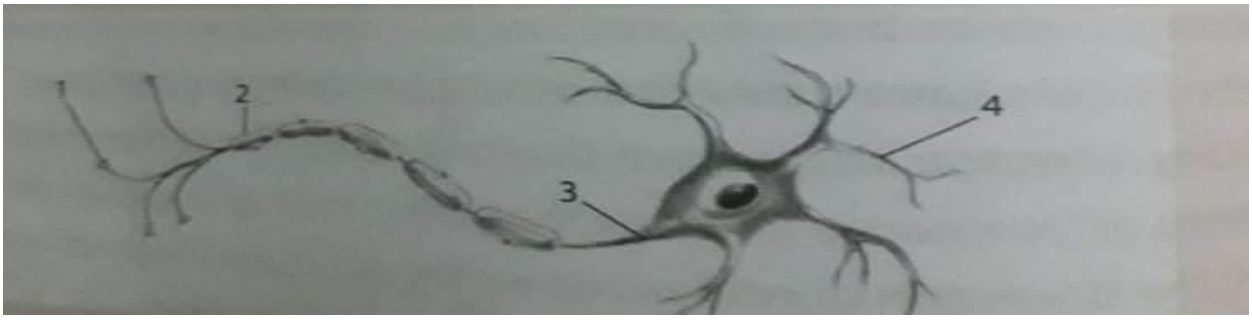
**Question and Answer chapter one biology . Nervous system and sense organs , class form four (12)**

**Q1 choose the correct Answer**

The diagram below shows a neurons .Use the diagram to answer the Questions that flow .




1. Which number indicates the structure from which neurons receives information

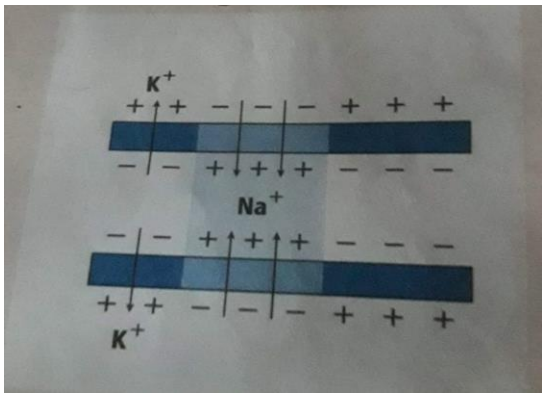
   a. 1 b. 2 c.3 **d. 4**

2. Which characteristics of the sympatric division of the automatic nervous system ?

   **a. stimulates digestion** c. dilates the bronchi

   b. slow heart rate d. converts glucose to glycogen

   Use the diagram below to answer Questions




3. What is occurring in diagram above

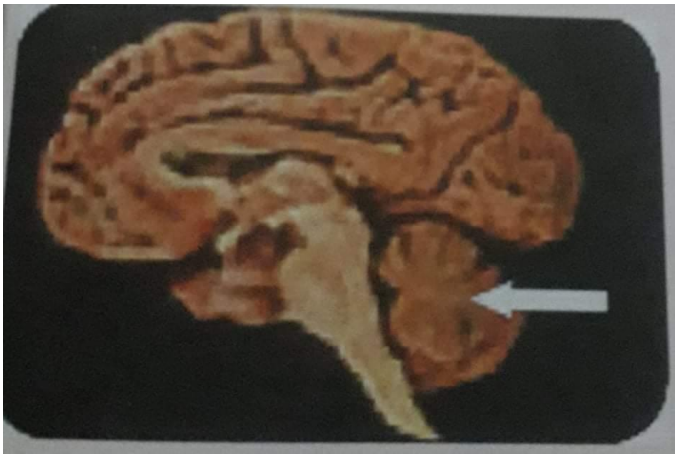
   a. K+ ions are entering the neurons

   b. Negatively charged proteins are leaving the neurons

   **c. Na+ ions are entering the neurons**

   d. The myelin coat has broken down , allowing into the free across the plasma membrane

Use the diagram below to answer Question 4.



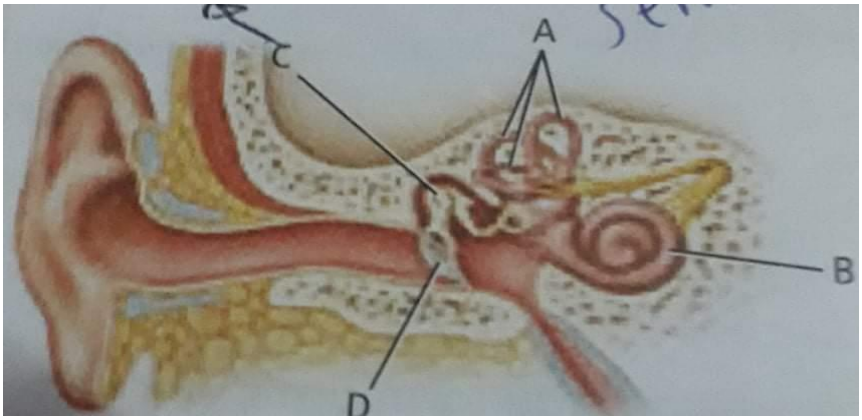
4. If the portion indicated by the arrow was damaged due to trauma , what effects would this person most likely Experiences ?
   a. **Partial or complete memory loss** c. body temperature fluctuations
   b. Trouble maintaining balance d. Rapid breathing
5. Which nervous system is the hypothalamus most involved in regulating ?
   a. Voluntary c. sensory
   **b.** Peripheral **d. automatic**
6. If there were a power outage in movie theater and only a few dim emergency light were it , which cell of the retina would most important for the seeming your way to the exist ?
   a. **Rods** b. Peripheral c. Rods and cones are equally important **.**
7. Which represents the correct sequence as sound waves travel in the ear to trigger an impulse ?
   a. Cochlea, incus , stape , eardrum .
   b. **Tympanum ,bones in the middle ear , cochlea , hair cell**.
   c. Auditory canal, tympanum , cochlea , malleus
   d. Hair cell , auditory canal , cochlea , malleus .

8. With which sense are free nerve endings associated?

**a.** Taste **c. touch**

b. Hearing d. sight

Use the diagram below to answer Question 9.




9. Some rides at amusement parks cause a person to become dizzy when the rides stop .which structure in the diagram most likely involved with the dizzy feeling .

a. **A** c . C

b. B d.D

10. A functional Reflex action Requires

a. **Only a sensory neurons and a motor neurons**

b. A sensory neurons , the thalamus , and a motor neurons

c. The cerebral cortex and a motor neurons

d. Only cerebral cortex and the thalamus .

11. As you sit Quietly reading this sentence , the part of the nervous system that is most active is the

a. Somatic nervous system .

**b. Sympathetic nervous system.**

c. Parasympathetic nervous system .

d. None of the choice is correct

12. A fight – or – flight response in the body is controlled by the :

**a. Sympathetic division of the nervous system.**

b. Parasympathetic division of the nervous system .

c. Releases of acetylcholine from postganglionic neurons

d. Somatic nervous system

13. The _____ cannot be controlled by conscious thought.

a. Motor neurons **c. autonomic nervous system**

b. Somatic nervous system d. skeletal Muscles

14. White matter is , and gray matter is

a. Comprised of axons : comprised of cell bodies and dendrites

b. Myelinated : UnMyelinated

c. Found in the CNS: also found in the CNS.

**d. All of the choices are correct**

15. A functional Reflex action Requires

**a. Only a sensory neurons and a motor neurons**

b. A sensory neurons , the thalamus , and a motor neurons

c. The cerebral cortex and a motor neurons

d. Only cerebral cortex and the thalamus .

**Q2 . Answer all of the Questions**

**1. For each pair of terms , explain the relationships between the terms ?**

a. Stimulus and depressant

b. Motor and sensory receptors

c. Brain stem and diencephalons

d. Resting potential and action potential

- **Stimulus** is a detectable change in the physical or chemical structure of an organism's internal or external environment.
- **depressant**, is a drug that lowers neurotransmission levels, which is to depress

- **Motor neurons ( efferent neurons )** are neurons get information from the brain
- **Sensory receptors** occur in specialized organs such as the eyes, ears, nose, and mouth, as well as internal organs.
- **Brain stem :** is a one of the most important organs of the human body ,and it is consists of about 100 billion neurons .
- **Diencephalons :** connects the cerebrum and the midbrain . it consists of the thalamus and hypothalamus
- **Resting potential** : a non-conducting nerve fibre is described as to be in arresting potential .
- **Action potential :** is a localized change in the resting membrane potential between the inside and outside of the nerve fibre caused by a stimulus .

2. ***Use the following terms in a separate sentence :between neurons , dendrites , myelin sheath , pons and synapse ?***
   - **Neurons ( Nerve cell )** : are the working unit of nervous system that generate and transmit nerve impulse .
   - **Dendrites :** Receives signals called impulse from another neurons and conduct the impulse to the cell body .
   - **myelin sheath** : is a fatty material that warps around nerve cell projections and neurons that do not have myelin sheath .
   - **synapse** is the conjunctions between dendrites of two adjacent neurons

3. ***use the following terms to separate sentence : thalamus , hypothalamus pons and medulla oblongata***
   - **thalamus , :** it consists of two masses of grey and white matter situated within the cerebral hemisphere just below the corpus callosum .
   - **hypothalamus** : is the small but important structure . situated below and in the front of the thalamus , immediately above the pituitary gland
   - **pons :** is situated in front of the cerebrum below the midbrain and the above of the medulla oblongata .

❖ **medulla oblongata**: is the most interior regions of the brain stem .

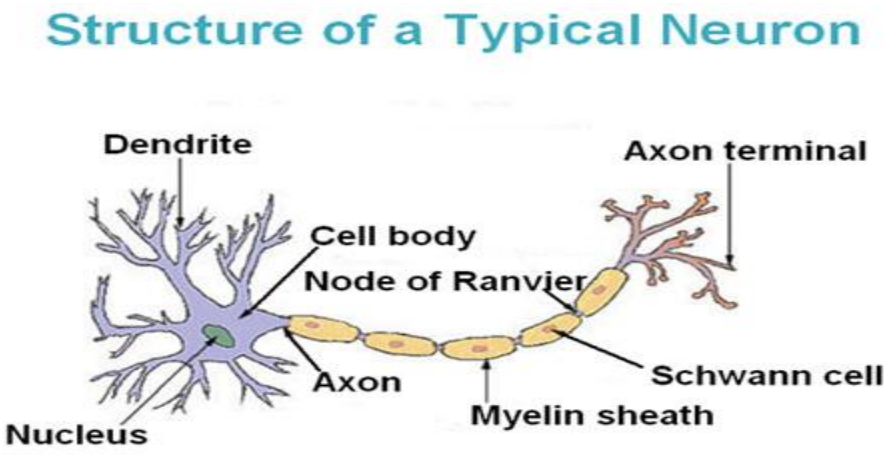
**4.** word root and origins the word pons is derived from the Latin pons , which means "bridge " using this information , explain how pons is an appropriate term for the part of the brain it is described .

❖ The pons (Latin for "bridge") is part of the brainstem, and in humans and other bipeds lies inferior to the midbrain, superior to the medulla oblongata and anterior to the cerebellum.

**5.** Discus the structure of neurons ?

❖ The neurons are different in size , length , and shape , as they may range from several millimeters to about a matter in length . that shows the neurons consists of three main regions : the dendrites , a cell body , and an axon .

- **Dendrites :** Receives signals called impulse from another neurons and conduct the impulse to the cell body .
- The nucleus of the neurons and many of the cell organelles are found in the **cell body**
- **Axon** carries the nerve impulse from the cell body to other neurons and muscles




**6.** Describe the chemical conditions within a neurons during resting potential and during action potential ?

❖ A resting (non-signaling) neuron has a voltage across its membrane called the **resting membrane potential**.

In **resting state** the nerve cell is polarized due to the difference in concentration s of ions across the plasma membrane .

During **action potential** , the membrane become more permeable to Na+ ion pumps temporality ceases , causing into the axoplasm by diffusion

**7.** ***Explain how action potential are transmitted from a neurons to another cell?***

❖

- ✓ Neurons communicate with each other via electrical events called 'action potentials' and chemical neurotransmitters.
- ✓ At the junction between two neurons (synapse), an action potential causes neuron A to release a chemical neurotransmitter.
- ✓ The neurotransmitter can either help (excite) or hinder (inhibit) neuron B from firing its own action potential.
- ✓ In an intact brain, the balance of hundreds of excitatory and inhibitory inputs to a neuron determines whether an action potential will result

**8.** Describe the role of two main organs of central nervous system ?\

- ❖ the **central nervous system CNS** is responsible for integrating sensory information and responding accordingly. It consists of two main components: **spinal cord** The serves as a conduit for signals between the **brain** and the rest of the body. It also controls simple musculoskeletal reflexes without input from the **brain**

**9. Define role of four portions of the brain?**

- ❖ **Cerebrum:** is the largest part of the brain and is composed of right and left hemispheres. It performs higher functions like interpreting touch, vision and hearing, as well as speech, reasoning, emotions, learning, and fine control of movement.
- ❖ **Cerebellum:** is located under the cerebrum. Its function is to coordinate muscle movements, maintain posture, and balance.
- ❖ **Brainstem:** acts as a relay center connecting the cerebrum and cerebellum to the spinal cord. It performs many automatic functions such as breathing, heart rate, body temperature, wake and sleep cycles, digestion, sneezing, coughing, vomiting, and swallowing.

**10.** Summarize the role of the sensory and motor division of the peripheral nervous system ?

- the **sensory division of the PNS** carries **sensory** information from the body to the central **nervous system**. The **motor division of the PNS** carries **nerve** impulses from the central **nervous system** to muscles and glands throughout the body. The **nerve** impulses stimulate muscles to contract and glands to secrete hormones
- The **sensory division** of the PNS carries sensory information from the body to the central nervous system.
- The **motor division** of the PNS carries nerve impulses from the central nervous system to muscles and glands throughout the body. The nerve impulses stimulate muscles to contract and glands to secrete hormones. The motor division of the peripheral nervous system is further divided into the somatic and autonomic nervous systems

**11. Relate the relationships between motor neurons , interneurons and sensory receptors**

- **Sensory neurons**

  **Sensory neurons** get information about what's going on inside and outside of the body and bring that information into the CNS so it can be processed. For instance, if you picked up a hot coal, sensory neurons with endings in your fingertips would convey the information to your CNS that it was really hot.

- **Motor neurons**

  **Motor neurons** get information from other neurons and convey commands to your muscles, organs and glands. For instance, if you picked up a hot coal, it motor neurons innervating the muscles in your fingers would cause your hand to let go.

- **Interneurons**, which are found only in the CNS, connect one neuron to another. They receive information from other neurons (either sensory neurons or interneurons) and transmit information to other neurons (either motor neurons or interneurons).

**12.** ***Describe the role of chemoreceptors in taste and smell*** **?**

- the sense of the test and smell are stimulated by chemicals and often function together , specialized receptors located high in the nose receptors to chemically in the air and sense information to olfactory bulb in the brain . while the testable are area specialized chemical receptors on the tongue that detect of the test of the sweet

**13.*List five different types of sensory receptors in the human body*** ?

- Humans have five basic senses: **sight**, hearing, smell, taste and touch

**14.Identify parts of the ear responsible for hearing and balancing ?**

- the inner **ear** has both **hearing and balance** organs. The **hearing part** of the inner **ear** is called the cochlea

**15.compare how rods and cones responsible to the light ?**

| Cones | Rods |
|---|---|
| It perceives light of high intensity | It perceives light of low intensity |
| It has high visual activity | It has low visual activity |
| Sensitive to the color | in Sensitive to the color |

**16.describe how the eye receives light stimulus and send a signal to the brain?**

- when **light** hits the retina (a **light**-sensitive layer of tissue at the back of the **eye**), special cells called photoreceptors turn the **light** into electrical **signals** **while** . These electrical **signals** travel from the retina through the optic nerve to the **brain**. Then the **brain** turns the **signals** into the images you see

**17.sate types of receptors that functions in the test and small?**

- The **sense** of the **smell** allows to perceive and to differentiate the odors

A taste receptor is a type of receptor which facilitates the **sensation** of taste. Of sweet , sour , salt , and the bitter .

**18.**Explain the role of skin in seeming touch , temperature and pain?

- the **skin** (keeping different aspects of the body constant, e.g., **temperature**). It does this by reacting differently to hot and cold conditions so that the inner body **temperature** remains more or less constant
- **The pain receptors** are very simple , consisting of free nerve endings that are found all tissue of the body except the brain

**19.*sate types and role of the peripheral nervous system*** ?

this part of the nervous system consists of :

**a. cranial nerves** : are nerves that arise from the brain an innervate areas in the head

b. **spinal nerves** and facel: are nerves that arise from the spinal cor and innervates the limbs.

**20.**outline the disease of the nervous system ?

a. dementia
b. Alzheimer diseases
c. Bacterial meningitis

**Prepared by : Abdullahi mohumed farah Rage**