

Question I:

(2 pts.)

Answer by true or false and correct the wrong ones:

- 1- Alzheimer is the result of destruction of neurons releasing dopamine
- 2- The speed of the nervous message is affected by the type of stimulus
- 3- Alzheimer patients have problems in muscular movements
- 4- Cell bodies of neurons synthesize one or several neurotransmitters and store them in vesicles.

Question II:

(4 pts.)

We learn about conditions in the external environment and within our bodies through receptors, which are activated by specific types of stimuli; light, pressure, chemicals etc. The perception of a stimulus occurs in the brain. The interaction between a stimulus and receptors elicit some change in the receptor, which in turn evokes an alteration in the ionic permeability of the plasma membrane. This change alters the membrane potential at the site of stimulation, which may trigger an action potential in a sensory neuron. For example photoreceptors located in the retina of our eyes contain membrane pigments that absorb light energy. Absorption of light energy causes a change in the molecular conformation of the pigment leading to a change in the membrane voltage. This alteration can trigger an impulse in a neuron of the optic nerve; generating electrical activity in those parts of the brain concerned with vision the result is perception of light.

Pick up from the text

- 1- The events leading to the formation of an action potential. (1 pt.)
- 2- Site of perception of the stimulus. (1 pt.)
- 3- By referring to your acquired knowledge explain how can the changes in the ionic permeability leads to the formation of an action potential. (2 pts.)

Question III:

(8.5 pts.)

A- The following table shows the variation of the speed of conduction of the nervous message as a function of the diameter and the nature of the nerve fiber.

Diameter of the nerve fiber in μm		1	2	3	4
Speed of conduction of the nervous message in a.u	Myelinated nerve fiber	1	5	8	15
	Non myelinated nerve fiber	0.1	0.5	1	1.5

- 1- Construct a graph that includes the different values shown in the table. (1.5 pt.)
- 2- Analyze the graph what can you deduce? (4 pts.)
- 3- Specify the chemical nature of myelin and its location at the level of neuron. (1 pt.)

B- The table below reveals the relation between the diameter and the speed of the conduction of the nervous message in two different nerve fibers: one for the squid and the other from a cat .

Nerve fiber	Diameter in μm	Speed of conduction in a.u
Squid	650	24
Cat	4	26

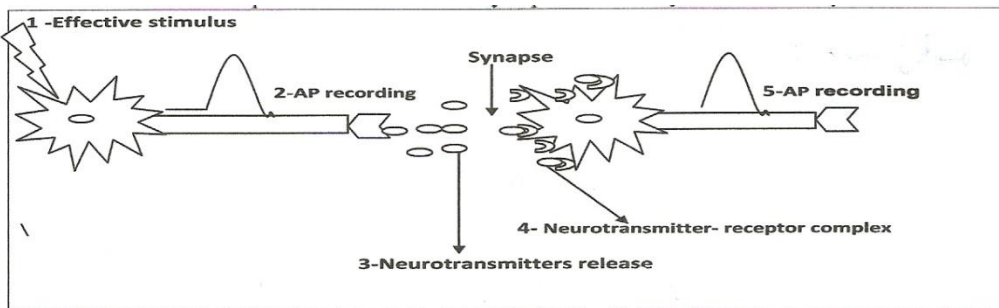
1- Formulate a hypothesis that explain the obtained result.

(2 pts.)

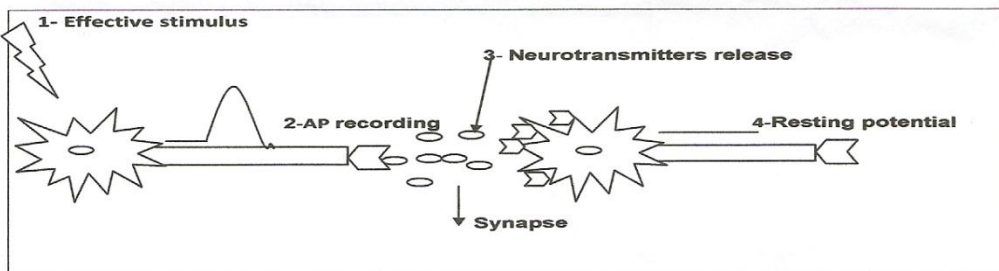
Question IV:

(5.5 pts.)

The documents below represent two kinds of synapse excitatory and inhibitory one.



Document one: Excitatory synapse



1- Change the above two documents into a text.

(1.5 pts.)

2- By referring to your acquired knowledge, explain the conduction of the nervous message through the synapse.

(2 pts.)

3- Compare the two types of synapses.

(2 pts.)

GOOD WORK