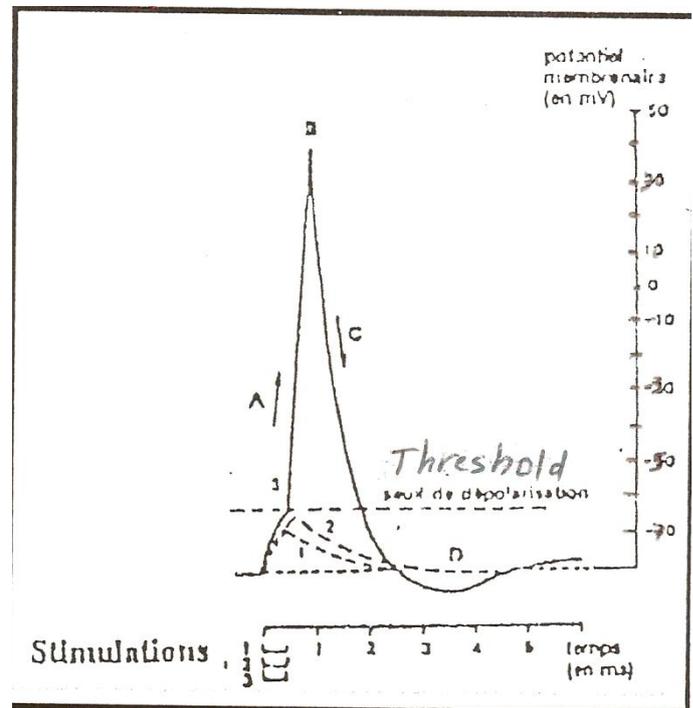


First unified exam

Question I (3pts)

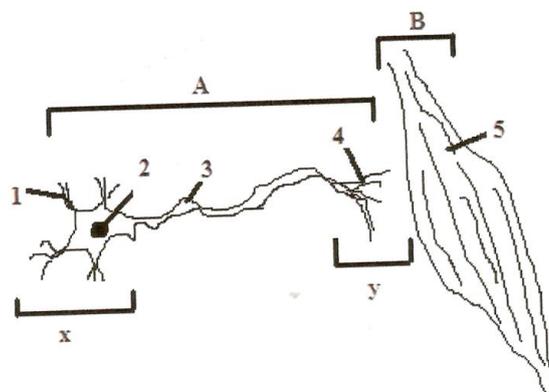
Three stimulations of increasing intensities (I1,I2,I3) are applied successively on the membrane of nervous cell .The document below represents the recorded result to such stimulations .



- a- Among the intensities used , which one is effective? Justify your answer .(0.5pt)
- b- Indicate the value of threshold where depolarization started .(0.5pt)
- c- Knowing that the intensity I4 > I3 , does the amplitude of action potential vary ? justify your answer . (0.5pt)
- d- What do the phases A and c of the recording correspond to ? Give an explanation for each .(1.5pts)

Question II(6pts)

A-Observe the document below:

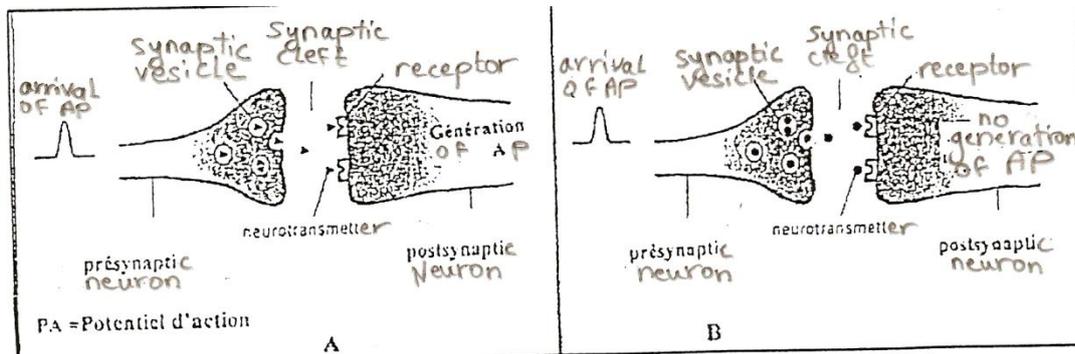


1-label the figure above (1,2,3,4,5)(1.25pts).

2-what is the nature of the region "Y" (0.25pt)

3-After the stimulation of A a response appeared on B , but the stimulation of B has no effect on A . How can you explain such a result ?(1pt)

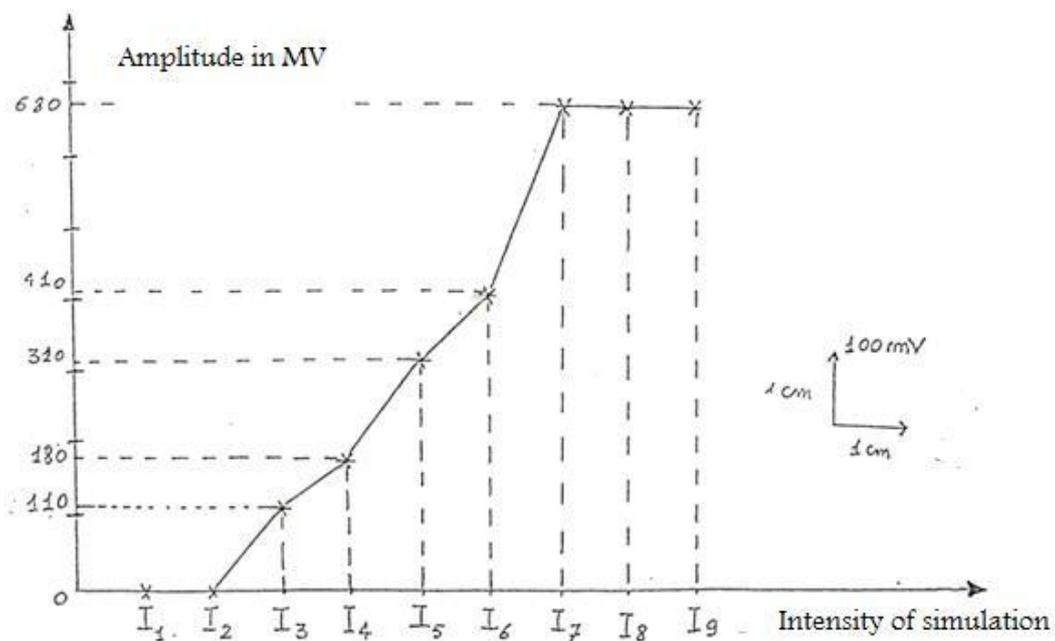
B –the document below reveals synapses between 2 neurons . one is excitatory and the other is inhibitory .



- Precise the nature of each synapse A and B . justify the response .(1.5pts)
- Explain the mode of transmission of the nervous message after an effective stimulation of the presynaptic neuron . (2pts)
Precise the fate of the neurotransmitter after this transmission .

Question III (7pts)

We apply to a nerve a series of stimulations of increasing intensity ($I_1 < I_2 < I_3 \dots I_9$).the amplitudes of obtained responses are presented in the curve below :



- Construct the table of the variation of the amplitudes of the nerve response as a function of the intensity of stimulation (3pts).
- Interpret the curve .(4pts)

Question IV(4pts)

Parkinson disease is one of the neurodegenerative diseases that are well known . Like other pathologies of this kind , it is known by its progressive slow destruction of certain neurons of the brain .

In the case of parkinson disease , it is the neurons of the cerebral trunk region that are destroyed , the black substance , which degenerates . These neurons extend prolongations connected to a subcortical region , the striatum used to control motor activities . The neurons of the black substance release in the striatum a chemical messenger , the dopamine . As those neurons die, less and less dopamine reaches the striatum . This results in symptoms known for the disease : trembling of hands at rest , muscular rigidity , **impossibility of slowing down of movements** .

Pick up from the text : 1) a- the cause of the disease (1pt)

b-the symptoms of the disease (1pt)

2) Draw two figures showing the neurons state in both persons: one normal , the other has Parkinson disease .(2pts)