This is a Class 1 exam

Lebanon Evangelical School for Boys and Girls

Lebanon Evangelical School

for Boys and Girls Loueizeh - Baabda

Stage Exam 01

17FEB2025

Do NOT write in this box. Your MARK will be placed here.

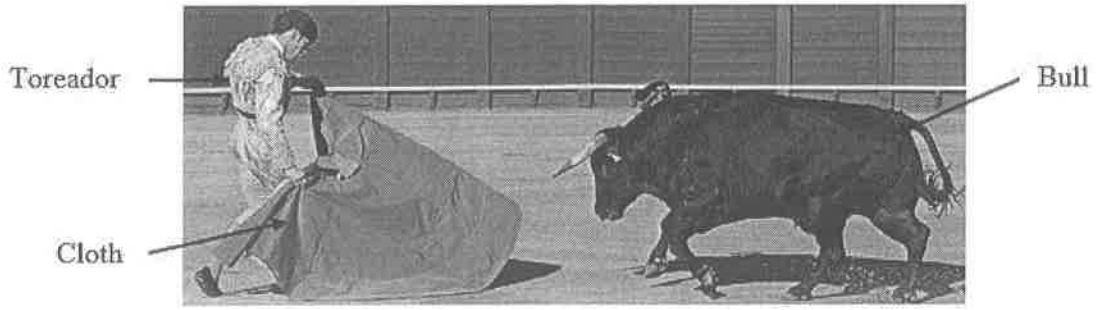
Subject :	Biology
Class :	10B, 10C and 10E
Teacher :	Christine Khalil
Duration :	1 hour
You are to answer the questions to this exam on : Squared paper	

Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- Do not open this paper until the teacher in charge instructs you to do so.
- The most important thing to remember in taking an exam is NEVER PANIC.
- If you are caught cheating in this exam, you will be awarded zero for ALL exams that are taken on this day.

Exercise 1 (4 points)

The corrida is a behavioral reaction of defense triggered in a bull. The observation of a bull shows that its behaviors are triggered by stimulations emitted by the toreador waving a cloth in his hand. When these gestures are observed by the bull, it triggers the corrida response.



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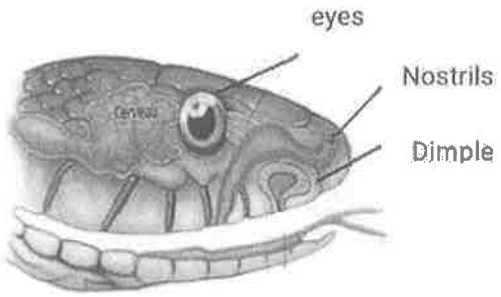
Draw the diagram showing the nervous pathway involved in the response described above.

Exercise 2 (8.5 points)

In order to study how does a snake recognize its prey, we realize the following experiments:

Experiments 1 and 2: We put a mouse with a snake in a box. In the first trial, we use a product to close the eyes of the snake while in the second trial we use another product that blocks its nose. In both cases, the snake succeeds in swallowing the mouse.

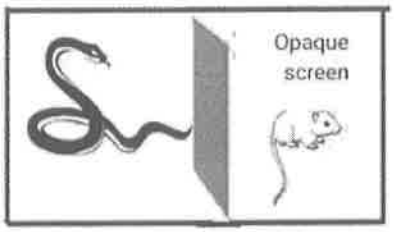
Experiment 3: By examining the snake's body, we notice the presence of 2 dimples in the head behind the nostrils. We close these dimples by a chemical substance and we put the snake with a mouse. The snake didn't swallow the mouse.



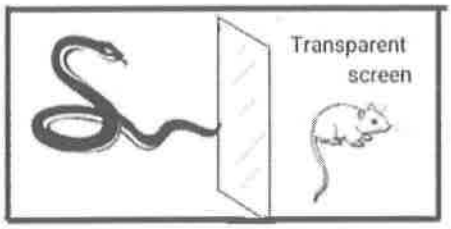
1. Pose the problem tested in this exercise. (1)
2. Indicate the senses of the snake tested in the first two experiments. (0.5)
3. Formulate the tested hypothesis in experiment 3. (1)
4. After analyzing the results of the experiments, deduce the sensory organ used by the snake in the recognition of its prey. (2)

To determine the nature of the stimulus that stimulates the previous sensory organ, we perform a fourth experiment.

A mouse is placed at 50 cm from the head of the snake between which is placed a screen in 2 different cases A and B, then we record in both cases the electrical activity of the nerve fiber connected to the sensory organ.



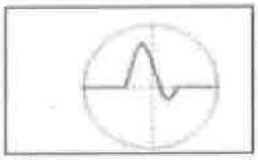
Document A



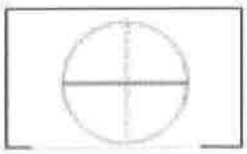
Document B

Document A: the screen used between the mouse and the snake stops light but allows the passage of heat. Recording A is obtained.

Document B: the screen used is transparent but absorbs heat. Recording B is obtained.



Recording A



Recording B

5. a. Name the figure observed in recording A. (0.5)
   b. Name the figure observed in recording B. (0.5)
   c. Name the different phases of recording A. (0.75)
   d. Indicate the value recorded in recording B. (0.25)
   e. Name the machine used to obtain recordings A and B. (0.5)
6. a. Analyze the obtained results. (1)
   b. Deduce the nature of the stimulus involved in the response of the snake. (0.5)

Exercise 3 (7.5 points)

In order to study the factors that affect the speed of conduction of the nervous message, researchers performed the following experiments:

Experiment 1:

A nerve fiber is exposed to different temperatures of increasing intensities and the corresponding speed of conduction of the nervous message is measured. The results are shown in document 1.

Temperature (°C)	18	25	30	35
Speed of conduction of the nervous message (m/s)	25	40	50	90

Document 1

1. Convert the table of document 1 into a graph. (1.5)
2. a. Analyze the results of document 1. (1)
   b. What can you conclude? (0.5)

Experiment 2:

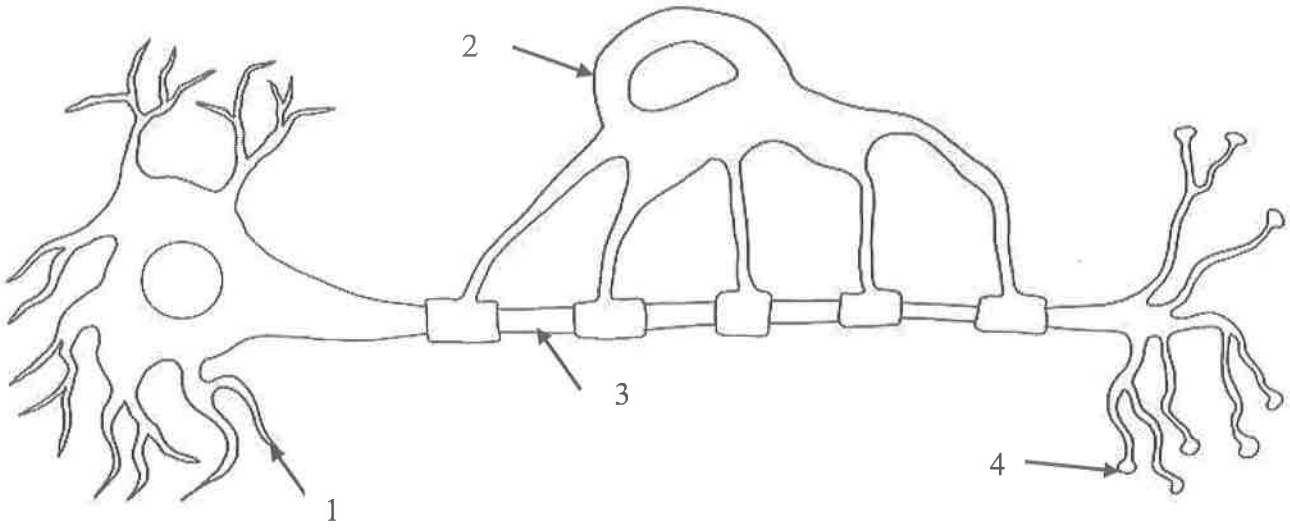
Two nerve fibers (A and B), having the same diameter, are stimulated with an effective stimulus. Fiber A is myelinated while fiber B is not. The results are represented in document 2.

	Myelinated Fiber A	Non-myelinated Fiber B
Speed of conduction of the nervous message (m/s)	45	5

Document 2

3. What is the chemical nature of myelin? (0.5)
4. a. Compare the results obtained in document 2. (1)
   b. What can you deduce? (0.5)

The nervous message is transmitted in the CNS by a specific cell shown in document 3.



Document 3

5. Determine the type of this cell depending on its shape. (0.5)
6. Label the numbers from 1 to 4. (2)

Answer Key SE01 10BCE

Exercise 1 (4 points, 0.25 for every idea)

Stimulus (0.25): Waving of the cloth (0.25) ⟶ Sensory organ (0.25): eyes (0.25) having on their surface receptors (0.25) photoreceptors (0.25) ⟶ Afferent message (0.25) through an afferent neuron (0.25) ⟶ CNS (0.25) (integration and processing) (0.25) ⟶ Efferent message (0.25) through an efferent neuron (0.25) ⟶ Effector organ (0.25): Muscles of the legs (0.25) ⟶ Reaction: (0.25) the corrida (0.25)

Exercise 2 (8.5 points)

1. How does a snake recognize its prey? (1)
2. Vision and smell. (each 0.25)
3. Dimples in the head of the snake are the sensory organ responsible for the recognition of its prey. (1)
4. The snake succeeds in swallowing the mouse when its eyes and nose are closed, while it doesn't catch the mouse when its dimples are closed. Therefore, the snake's dimples are the sensory organ used by the snake in the recognition of its prey. (2)
5. a. Action potential. (0.5)
   b. Resting potential. (0.5)
   c. Depolarization, Repolarization, Hyperpolarization. (each 0.25)
   d. -70 mV. (0.25)
   e. Oscilloscope or CASE (0.5)
6. An action potential is obtained when the mouse and the snake are separated by an opaque screen that permits only the passage of heat and not light, while a resting potential is recorded when the mouse and the snake are separated by a transparent screen that permits only the passage of light and absorbs the heat. (1)
7. Heat is the stimulus that stimulates the dimples of the snake. (0.5)

Exercise 3 (7.5 points)

2. a. As the temperature increases from 18 to 35 °C, the speed of conduction of the nervous message increases from 25 to 90 m/s. (1)

b. High temperatures accelerate the transmission of the nervous message. (0.5)

3. Lipid. (0.5)

4. a. The speed of conduction of the nervous message in the myelinated fiber A is 45 m/s which is higher than that in the non-myelinated fiber B which is 5 m/s. (1)

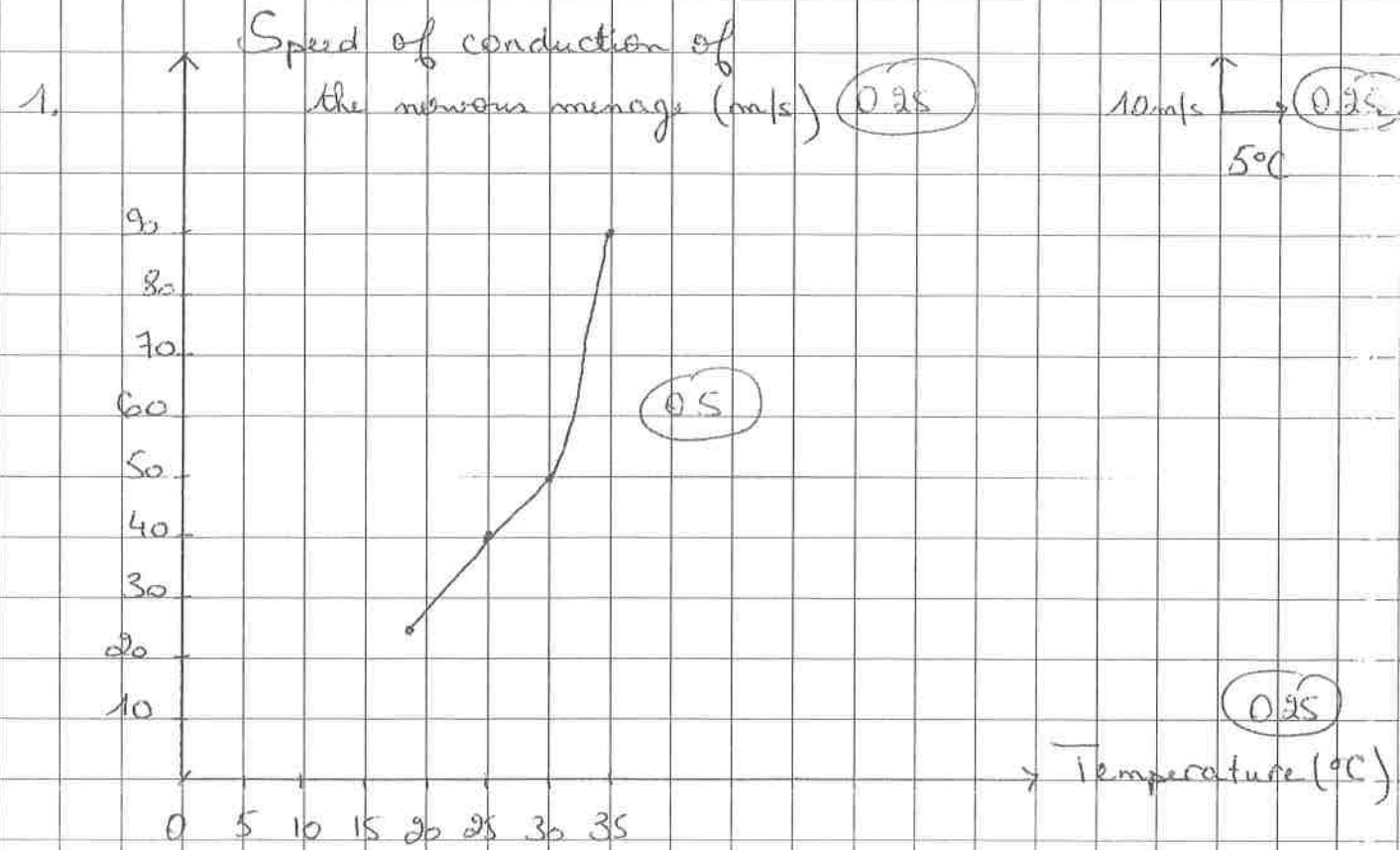
b. Myelin accelerates the transmission of the nervous message. (0.5)

5. Multipolar neuron. (0.5)

6. 1. Dendrites 2. Schwann cells 3. Nodes of ranvier 4. Synaptic knobs. (each is 0.5)

Exercise 3

1.



(0.25) (0.25) (0.5) (0.25)

Title: A graph showing the variation of the speed of conduction of the nervous menage as a function of the temperature (0.25)