This is a Class 1 exam

Lebanon Evangelical School for Boys and Girls

Loueizeh - Baabda

SE01 Exam

09NOV2026

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

Subject :	Biology	
Class :	10B, 10C and 10E	
Teacher :	Mrs. Christine Khalil	
Duration :	1 hour	
You are to answer the questions to this exam on : Lined 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 (2 points)

Choose the letter of the correct answer.

1. **What is an effector organ?**
   a. An organ that detects a stimulus.
   b. An organ that carries sensory information.
   c. A muscle or a gland that produces a response.
   d. An organ that protects the brain.

2. **Which statement about glial cells is correct?**
   a. All glial cells carry nerve impulses in the same way as neurons.
   b. Glial cells have no role in the nervous system function.
   c. Glial cells help neurons to function properly.
   d. Glial cells are found only in the brain.

3. **Which cell carries impulses to muscles?**
   a. Sensory neuron.
   b. Motor neuron.
   c. Interneuron.
   d. Glial cells.

4. **Which part of the neuron receives the signal?**
   a. Dendrite.
   b. Axon.
   c. Nucleus.
   d. Receptor.

Exercise 2 (8 points)

When a bee faces a certain stimulus, it defends itself by stinging the source of danger, for example a human who is taking its honey. A bee stings using a leg-like structure called the stinger, which is located at the end of its body.

Bee keepers have always been concerned about the stimuli that led to the stinging response of honeybees. They believe that the color of the clothes as well as certain movements provoke the bees to sting them.

In order to investigate the effect of the color and movement on stinging responses, two experiments were done and the results are in document 1.

Experiment 1: White and black cotton balls were placed with the bees inside the hive.

Experiment 2: A ball was held motionless in front of the hive's entrance. However, another ball of the same color was moved quickly up and down.

Factors	Color of the ball		Movement of the ball	
	White	Black	Motionless	Moving fast
Number of stings	6	36	2	7

Document 1

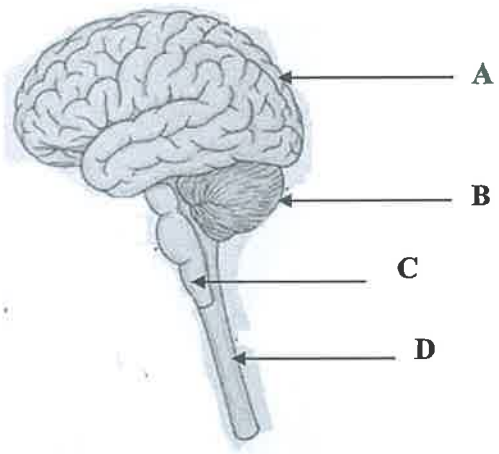
1. Pose the problem studied in this exercise. (1)
2. a. Compare the results obtained upon changing the color of the ball. (0.5)
   b. Compare the results obtained upon changing the movement of the ball. (0.5)
   c. What can you deduce from all the results above? (0.75)
3. Suggest some measures that bee keepers can do to help them avoid stinging while collecting honey. (1)
4. Referring to all the above, draw a functional diagram showing the pathway of the nervous message leading to the stinging response. (4.25)

Exercise 3 (3.5 points)

The nervous system coordinates voluntary and involuntary actions and responses by transmitting signals between different parts of the body.

In most animals, including humans, the nervous system consists of two parts: the central nervous system (CNS) and the peripheral nervous system (PNS).

Document 1 represents the CNS in an animal.



Document 1

1. Label the structures form A to D. (1)

In a study involving the PNS, scientists wanted to determine the function of two nerves present in a cat (the optic nerve and the sciatic nerve). The experiments performed are shown in document 2.

Experiment	Response of the cat
1. Presence of a dog nearby the cat	Vision and running away
2. Cutting and damaging the optic nerve	Loss of vision but normal muscle activity and movement
3. Cutting and damaging the sciatic nerve	Normal vision but the cat lost the ability to run away

Document 2

2. a. Analyze the previous experiments. (1.5)
   b. What can you conclude concerning the function of the optic nerve and that of the sciatic nerve? (1)

Exercise 4 (6.5 points)

Multiple sclerosis is a disease corresponding to certain structural abnormalities at the level of the nervous system. It is due to the appearance of sclerosis which are thick plaques of connective tissues that deposit on different regions of the nerve fiber. The formed plaques inhibit the conduction of the nervous impulse along the nerve fiber and thus severe disorders of movement and vision take place.

The speed of the nerve impulse conducted along different nerve fibers is measured and the results are shown in document 1.

Axon	Myelinated	Non-myelinated	Affected with multiple sclerosis
Speed of conduction of the nerve impulse (m/s)	100	10	7

Document 1

1. Convert the results of document 1 into a histogram. (2)
2. a. Compare the speed of conduction of the nerve impulse in a myelinated fiber to that of the non-myelinated fiber. (0.5)
   b. What can you conclude? (1)
3. Formulate a hypothesis to explain the low speed of conduction of the nervous message in a person affected with multiple sclerosis. (1)

In the framework of studying another factor that affects the speed of transmission of the nervous message, a series of experiments are performed. (Document 2)

Temperature (°C)	12	18	27
Speed of transmission of the nervous message (m/s)	15	25	30

Document 2

4. Interpret the results of document 2. (2)

Answer Key for SE01 10BCE

Exercise 1 (2 points, each 0.5)

1. C 2. C 3. B 4. A

Exercise 2 (8 points)

1. What is the effect of the color and movement on stinging responses? (1)
2. a. When the color of the ball was white, the number of stings was 6 which is less than that when the color of the ball was black which is 36. (0.5)
   b. When the ball was motionless, the number of stings was 2 which is less than that when the ball was moving fast which was 7. (0.5)
   c. Dark colors and moving fast are stimuli for bees to initiate the stinging response. (0.75)
3. Wear brighter colors and move slowly. (1)
4. Stimulus: Dark clothes and fast movements ⟶ Sensory organ: Eyes Receptors: Photoreceptors ⟶ Sensory nervous message, Sensory nerve ⟶ CNS (processing) ⟶ Motor nervous message, motor nerve ⟶ Effector organ: Stinger ⟶ Response: Stinging (4.25)

Exercise 3 (3.5 points)

1. A. Cerebrum B. Cerebellum C: Brainstem D: Spinal cord (each one is 0.25)
2. a. When a dog is present nearby a cat, the cat sees it and runs away. However, when we cut and damage the optic nerve, the cat loses vision but still has normal muscle activity and movement. While when we cut and damage the sciatic nerve, the cat has normal vision but loses the ability to run away. (Each one is 0.5)
   b. The optic nerve is sensory while the sciatic nerve is motor. (1)

Exercise 4 (6.5 points)

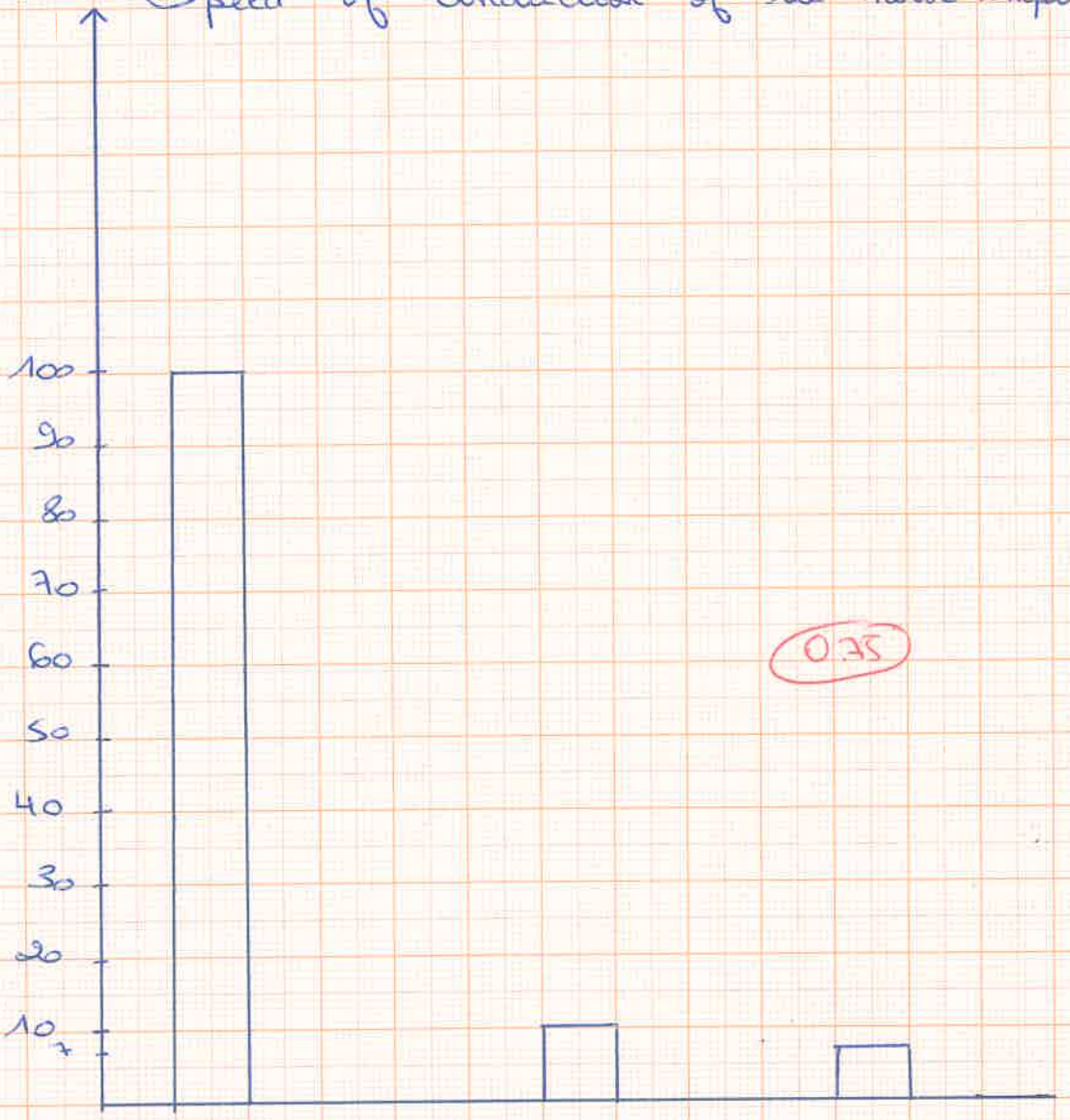
1. (2)
2. a. The speed of conduction of the nerve impulse in a myelinated fiber is 100 m/s which is greater than that of non-myelinated nerve fiber which is 10 m/s. (0.5)
   b. The presence of myelin accelerates the transmission of the nervous message. (1)
3. Hypothesis: Multiple sclerosis damages the myelin at the level of the nerve fibers. (1)
4. As the temperature increases from 12 to 27 °C, the speed of transmission of the nervous message increases from 15 to 30 m/s. This indicates that high temperatures accelerate the transmission of the nervous message. (2)

05

Speed of conduction of the nerve impulse (m/s)

10 m/s

0.25



0.25

0.25

Title: Histogram showing the speed of conduction of the nerve impulse (m/s) in different axons.

0.25