

B6 Level Assessed Task 2

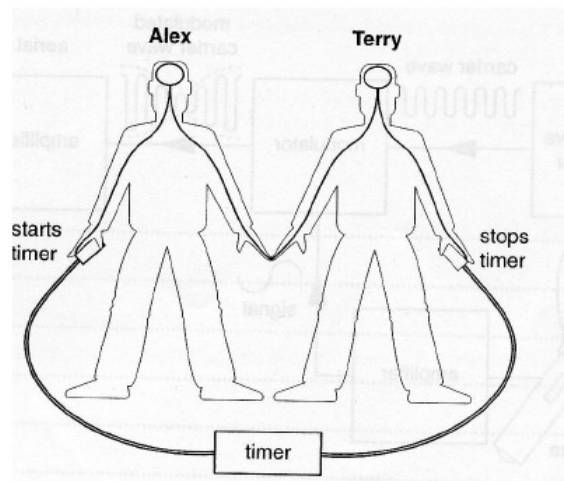
1

Answer all questions.

1. Alex and Terry carry out an experiment on their reactions.

- Alex squeezes Terry's hand. At the same time she starts the timer.
- Terry reacts and stops the timer.

The path taken by the nerve signal is shown in the diagram.



(a) Complete the sentence.

The signal is carried along a nerve cell by an impulse.[1]

(b) The signals travel through these parts of Terry's nervous system.

- A central nervous system
- B motor neurone
- C receptor cells
- D effector cells
- E sensory neurone

They are in the wrong order.

Using the letters **A**, **B**, **C**, **D** and **E** write the correct order in the boxes.

The first one has been done for you.

C								
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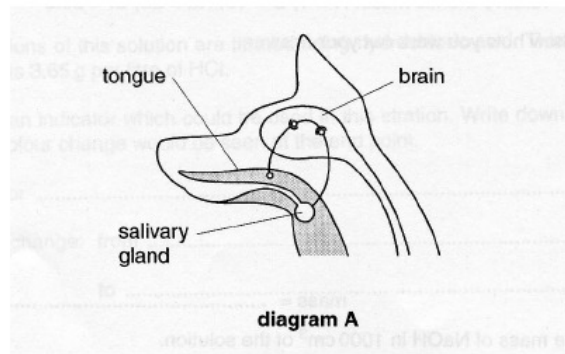
[3]

[Total: 4]

2. (a) A Russian scientist called Ivan Pavlov investigated reflexes in dogs.

The dogs produced saliva when they tasted food on the tongue.

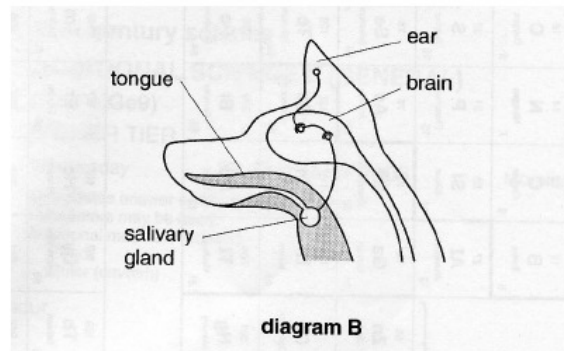
The nerve pathway for this reflex is shown in diagram A.



- (i) Write down the name given to this type of reflex.

.....[1]

- (ii) At each feeding time, Pavlov rang a bell as the dogs were fed.
After repeating this for several days, he found that the sound of the bell alone would make the dogs produce saliva.



The nerve path for this reflex is shown in diagram B.

Write down the name given to this type of reflex.

..... [1]

(iii) The following statements are about these reflexes.

Decide if each statement **best** fits reflex **A**, reflex **B**, both reflexes or neither reflex.

Put a tick (✓) in the correct column for each statement.

statement	neither reflex	reflex A	reflex B	both reflexes
The reflex can be learned.				
The reflex is involuntary.				
The motor neuron connects to the ear.				
The stimulus is the tongue.				
Chemicals transmit the impulse across a synapse.				

[5]

(b) Brian is revising reflexes for his exam. He is trying to learn how the reflex works.

Choose from the following list to answer the next two questions.

brain cortex long-term memory short-term memory synapse

(i) After reading through his notes just once, which **best** describes where Brian's memories are stored?

..... [1]

(ii) After revising several times, which **best** describes where Brian's memories are stored?

..... [1]

(iii) Which one of the following statements about memory and learning is **not** correct?

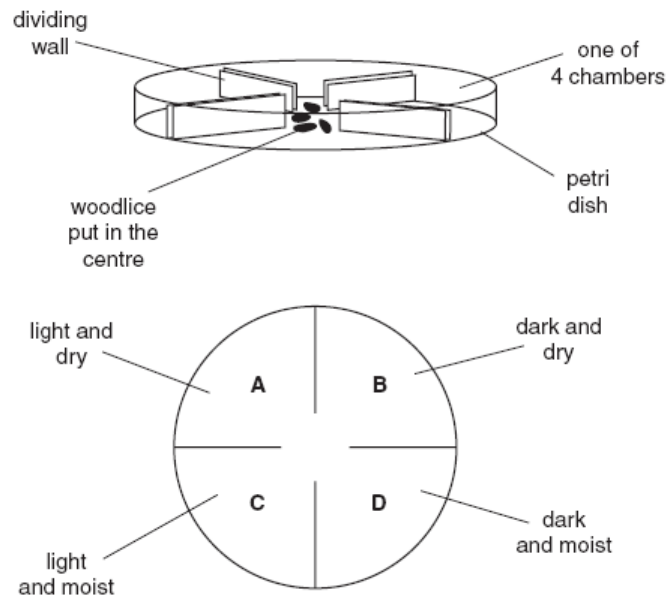
Put a tick (✓) in the box of the **incorrect** statement.

Learning is a result of some pathways in the brain becoming more likely to transmit impulses.	<input type="checkbox"/>
Learning is more likely to happen if there is repetition of experiences.	<input type="checkbox"/>
A strong stimulus (e.g. colour, smell, sound) helps to remember information.	<input type="checkbox"/>
Scientists have not yet provided an adequate scientific model of memory.	<input type="checkbox"/>
During learning, neurones produce a fatty sheath which speeds up impulses.	<input type="checkbox"/>

[1]

[Total: 10]

- 7 Charlie carries out an experiment using woodlice. He puts 20 woodlice into the centre of a petri dish so that they can move freely into four chambers, **A**, **B**, **C** and **D**. Each chamber has different conditions.



After five minutes, Charlie counts the woodlice in each chamber. He records his results in a table.

chamber	chamber conditions	number of woodlice
A	light and dry	1
B	dark and dry	6
C	light and moist	4
D	dark and moist	9

- (a) What is the percentage of woodlice found in chamber **D**?

Put a ring around the correct answer.

9% 20% 45% 90%

[1]

(b) Put a tick (✓) in the box next to **each** statement which could be used to explain the behaviour of the woodlice in the experiment.

Woodlice are attracted to light.

Woodlice are attracted to shade more than to moisture.

Woodlice avoid too much moisture.

Woodlice may dry out easily.

[2]

(c) The behaviour pattern of the woodlice shown in this experiment is a reflex action.

Finish the sentence. Choose a word from this list.

complex

involuntary

voluntary

Simple reflexes produce rapid responses.

[1]

[Total: 4]

8 This question is about synapses between sensory and motor neurons.

(a) Here are the steps which take place at a synapse as an impulse passes from a sensory neuron to a motor neuron.

They are in the wrong order.

- A chemical released into the synapse
- B chemical diffuses across the synapse
- C motor neuron transmits an impulse
- D sensory neuron transmits an impulse
- E chemical binds to the receptor molecules

Fill in the boxes to show the right order. The first one has been done for you.

D				
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[3]

(b) The drug ecstasy blocks the removal of the synapse chemical serotonin.

How will this affect the amount of serotonin in the synapse gap between two neurons?

Put a tick (✓) in the box next to the correct answer.

- same amount of serotonin
- increased amount of serotonin
- decreased amount of serotonin

[1]

(c) Synapse chemicals, like serotonin, are recognised by a specific receptor molecule found on one side of the synapse.

How does this affect the transmission of nerve impulses?

Put a tick (✓) in the box next to the correct answer.

- The strength of the nerve impulse is increased.
- The nerve impulses can only travel in one direction.
- The speed of the nerve impulse transmission is increased.

[1]

[Total: 5]

9 The Russian scientist Ivan Pavlov is famous for his work with learned behaviour in dogs.

His experiments included the following steps.

- A dog salivates when given food.
- A bell is rung each time the dog is fed.
- After some time, the bell is rung without giving the dog food.
- The dog salivates when it hears the bell.

(a) What is the function of each step?
Draw a straight line from each **step** to its correct **function**.

step	function
bell ringing	primary stimulus
food given	response
dog salivating	secondary stimulus

[1]

(b) Which part of the dog's brain is involved in learned behaviour patterns?

Put a ring around the correct answer.

hypothalamus **pituitary gland** **medulla** **cerebral cortex**

[1]

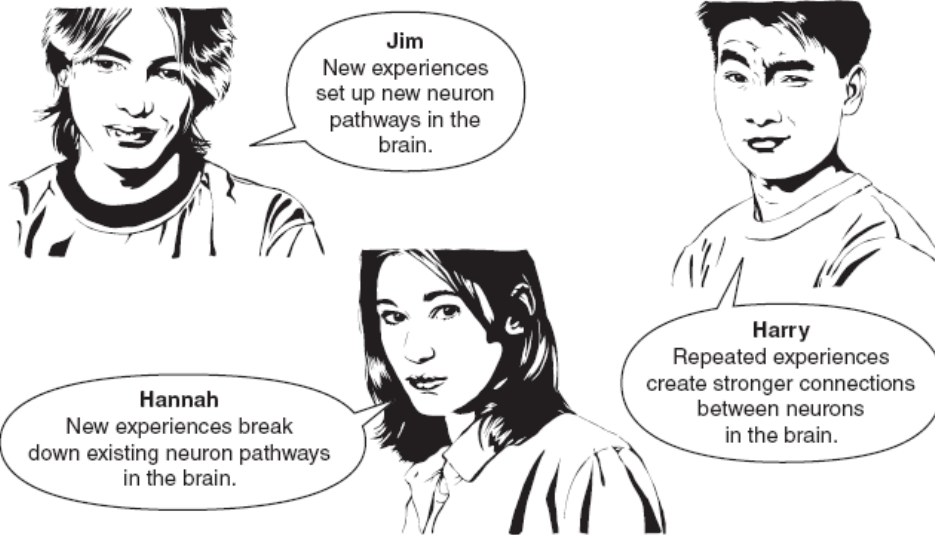
(c) Which of the following types of behaviour are learned?

Put a tick (✓) in the box next to **each** correct answer.

- Some bacteria can swim towards sources of food.
- Some birds may avoid eating caterpillars with warning colours.
- Houseflies fly rapidly away if they detect any sign of movement.
- Snails draw into their shells if they detect any sign of movement.
- Goldfish may swim to the front of their tank when people walk up to feed them.

[2]

(d) Three friends discuss different ways of explaining what happens in the human brain when we learn.



Put a ring around the names of the **two** people with the **best** explanations.

Jim

Hannah

Harry

[1]

[Total: 5]