

Biology unit 5 homework – Homeostasis & response

For each of the questions below: -

Highlight the command word if there is one & annotate what the command word means. - Answer the question!

Q1. This question is about reproduction.

- (a) Describe the difference between the way hormonal and non-hormonal methods of contraception work.

Give **one** example of each method of contraception.

(3)

Q2. This question is about the human nervous system.

- (a) A ball is thrown towards a boy.

As the ball is thrown, information passes along a pathway to allow the boy to catch the ball.

Draw **one** line from each action to the correct part of the pathway.

Action

Retina cells in the eye detect the light from the ball

The impulse reaches the brain which 'sees' the ball and sends an impulse to the arm muscle

The muscle in the arm contracts

The arm stretches to catch the ball

Part of the pathway

Coordinator

Effector

Response

Receptor

Stimulus

(3)

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For each of the questions below: -

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Students in a college made this hypothesis:

‘reaction time will increase as the time you have been awake increases.’

The students set up an investigation to test their hypothesis.

This is the method used.

1. Find 5 volunteers willing to stay awake for 24 hours.
2. Keep the volunteers in a room where they can study, use an exercise bike or watch TV as they wish.
3. Provide food, water, coffee and tea as requested.
4. Measure the volunteers’ reaction time every 4 hours using a computer program.

(b) What was the independent variable in this investigation?

(1)

The students used a computer program to test reaction time.

(c) Describe one **other** method that can be used to measure reaction time.

(3)

(d) Which method would you choose to use at your school?

Tick **one** box.

Computer program

Method described in part (c)

Give **one** reason for your choice.

(1)

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The table shows the students' results.

Time awake in hours	Reaction time in seconds					
	Volunteer					Mean
	A	B	C	D	E	
0	0.25	0.33	0.35	0.21	0.27	0.28
4	0.20	0.30	0.31	0.19	0.26	0.25
8	0.21	0.28	0.33	0.20	0.27	0.26
12	0.26	0.40	0.58	0.22	0.30	0.35
16	0.44	0.49	0.83	0.27	0.75	X
20	0.64	0.55	1.11	0.39	1.40	0.82
24	0.92	0.61	1.15	0.45	1.35	0.90

(e) Calculate value **X** in the table.

Give your answer to 2 significant figures.

X = _____ seconds

(2)

(f) Describe the pattern of results for mean reaction time as the time awake increases.

(2)

(g) Do these results support the students' hypothesis: 'reaction time will increase as the time you have been awake increases'?

Give **one** reason for your answer.

(1)

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(g) Give **two** ways the students could improve their investigation to make it more valid.

1. _____

2. _____

(2)
(Total 15 marks)

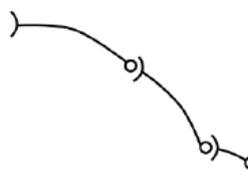
Q3 The nervous system allows humans to respond to their surroundings.

The figure below shows two nerve pathways.

Nerve pathway A



Nerve pathway B



(a) Nerve pathway **A** is 92 cm long.

A nerve impulse travels along pathway **A** at 76.2 m / s.

Calculate how long it takes for the nerve impulse to travel the length of the pathway.

Use the equation:

$$\text{distance} = \text{speed} \times \text{time}$$

Time = _____ s

(3)

(b) Nerve pathways **A** and **B** are the same length.

The nerve impulse takes longer to travel along pathway **A** than along pathway **B**.

Use the figure above to explain why.

(3)