



CHEMISTRY ONLINE
— **TUITION** —

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BIOLOGY

ORGANISMS RESPOND TO CHANGES IN ENVIRONMENTS

Level & Board	AQA (A-LEVEL)
TOPIC:	HOMEOSTASIS
PAPER TYPE:	SOLUTION - 1
TOTAL QUESTIONS	5
TOTAL MARKS	20

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Homeostasis - 1

1.

(a) Osteocalcin stimulates the release of more insulin

More insulin causes more inactive osteocalcin to be released

(b)

Changes in pH causes ionic and hydrogen bonds to break

Therefore, changes the tertiary structure

(c)

Insulin binds to a GLUT4 protein

Therefore, more glucose enters the cell

2.

(a)

The binding causes a change in the shape

Which activates the enzyme

(b)

Phosphorylates STA1

IRF Protein

(c) Interferon gamma's regulation of helper T cell formation is an example of positive feedback because the production of interferon gamma by helper T cells leads to an increase in the production of more helper T cells, enhancing the immune response.

OR

Causes more T helper cells to form

Therefore, more interferon produced by the T helper cells

3.

(a) Positive feedback makes them want to drink more. In this investigation, the higher the concentration of sucrose in a rat's mouth, the higher the frequency of nerve impulses from each taste receptor to the brain.

OR

high conc of sucrose = high percentage of dopamine release makes them want to drink more
positive feedback makes them want to drink more.

(b) Refractory period allows discrete, separate when maximum frequency is reached high conc of sucrose stays the same

(c)

Negative feedback stops the desire to eat

Limits the amount of food eaten

Therefore, prevents obesity

4.

(a) Acetylcholine binds with receptors in the post-synaptic membrane. These receptors change shape, opening a channel to allow sodium ions to diffuse in. As the receptors are only present on the post-synaptic membrane, the impulse cannot travel back, so it is unidirectional.

OR

Acetylcholine released from presynaptic side

Receptors in post synaptic side

5.

(a)

Rapid response

Short duration

I am Sorry !!!!!

(b)

	1	2	3
Percentage	80	0	0

*Ignore % sign.***6.****(a)**

Eaten

Containing carbs

Glucose absorbed from intestine into blood

Long time after insulin injection

Does not need to convert glucose to glycogen

(b)

Shows positive correlation / directly proportional

A range of results for a particular value / values (for different colors) overlap

Urine test only an arbitrary scale / not directly related to concentration / color is subjective / few colors values

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I am Sorry !!!!!



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- Founder & CEO of Chemistry Online Tuition Ltd.
- Completed Medicine (M.B.B.S) in 2007
- Tutoring students in UK and worldwide since 2008
- CIE & EDEXCEL Examiner since 2015
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