Exercise walk-through

Feedback ▪ 4.4

eXercise

You must be able to

- distinguish **negative feedback** 负反馈 from **positive feedback** 正反馈
- give a biological example of each
- explain how negative feedback maintains **homeostasis** 稳态

Method — Negative feedback

Negative feedback reverses a change to restore a set point — it keeps conditions stable (**homeostasis**). The response **opposes** the stimulus.

Method — A worked negative example

Blood glucose rises → insulin is released → cells take up glucose → blood glucose falls back to normal. The rise triggers a response that lowers it.

Method — Positive feedback

Positive feedback amplifies a change, pushing it further from the start — used for processes that must go to completion. The response **reinforces** the stimulus.

Method — A worked positive example

During childbirth, stretching of the uterus releases oxytocin $\rightarrow$ stronger contractions $\rightarrow$ more stretching $\rightarrow$ more oxytocin, until birth. The change builds on itself.

Practice 2.1 ▪ 1 mark

Which type of feedback keeps a condition stable?

Solution 2.1

Method: Negative feedback

Worked steps

Negative feedback B1.

Practice 2.2 ▪ 1 mark

Does positive feedback oppose or amplify a change?

Solution 2.2

Method: Positive feedback

Worked steps

Amplify B1.

Practice 2.3 ▪ 1 mark

Give one example of negative feedback.

Solution 2.3

Worked steps

Any one: blood glucose control, body temperature regulation B1.

Exam-style 3.1 ▪ 1 mark

Negative feedback maintains homeostasis by

A amplifying the change

B reversing the change toward the set point

C stopping all responses

D ignoring the stimulus

Solution 3.1

Method: Negative feedback

A amplifying the change

B reversing the change toward the set point ✓

C stopping all responses

D ignoring the stimulus

Worked steps

B — reversing the change toward the set point.

Exam-style 3.2 ▪ 3 marks

Blood glucose rises after a meal.
(a) Describe the negative-feedback response that returns it to normal.
(b) State whether childbirth (oxytocin) is negative or positive feedback.

Solution 3.2

Method: A worked negative example

Worked steps

(a) The rise triggers insulin release; insulin makes cells take up glucose; blood glucose falls back to normal **M1** **M1** **A1**. (b) Positive feedback **B1**.

Exam-style 3.3 ▪ 2 marks

Explain why positive feedback is useful for a process like blood clotting or childbirth.

Solution 3.3

Worked steps

Positive feedback amplifies the change so the process quickly runs to completion (e.g. a clot forms fast, or birth finishes), which is exactly what these one-time events need M1 A1.