AP BIOLOGY • EXERCISE SHEET

4.4 Feedback

Name: _____ Class: _____ Date: _____ **Total: 10 marks**

Objective

Build the skills to answer exam questions on **feedback** —negative and positive.

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

1 Worked examples

Study these first. Each one shows the method for a question type used later —follow the steps and you can do the Practice and Exam-style questions yourself.

■ Negative feedback

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

■ 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.

■ 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.

■ A worked positive example

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

2 Practice

Now apply the methods above.

2.1 Which type of feedback keeps a condition stable? [1]

2.2 Does positive feedback oppose or amplify a change? [1]

2.3 Give one example of negative feedback. [1]

3 Exam-style questions

3.1 Negative feedback maintains homeostasis by [1]

- **A** amplifying the change
- **B** reversing the change toward the set point
- **C** stopping all responses
- **D** ignoring the stimulus

3.2 Blood glucose rises after a meal.

(a) Describe the negative-feedback response that returns it to normal. [3]

(b) State whether childbirth (oxytocin) is negative or positive feedback. [1]

3.3 Explain why positive feedback is useful for a process like blood clotting or childbirth. [2]

4 Go further

You are now ready for the real exam questions on this subtopic:

- work through the **4.4 Feedback** lesson on the **Learn** page;
- read the **Feedback** section of the AP Biology handout on the **Know** page.

Solutions

2.1 Negative feedback.

2.2 Amplify.

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

3.1 B —reversing the change toward the set point.

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

3.3 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.