D3.3 Homeostasis

What the Cell · DP Biology · worksheet · statements D3.3.1–6

Name _____ **Date** _____ **Total** _____ / 48

About 50 minutes, or one section at a time. A calculator is allowed. The number of marks shows how many separate points to make.

Section A: Recall

9 marks

1 **Define** homeostasis. D3.3.1 **[1]**

2 **List** three variables that are controlled by homeostasis in humans. D3.3.1 **[2]**

3 **State** the type of cell that secretes insulin, and where these cells are found. D3.3.3 **[2]**

4 **State** the part of the brain that acts as the temperature control centre. D3.3.5 **[1]**

5 **State** the gland that secretes thyroxin. D3.3.5 **[1]**

6 **Distinguish** between glucagon and glycogen. D3.3.3 **[2]**

Section B: Understanding

13 marks

7 **Explain** why homeostasis uses negative feedback rather than positive feedback. D3.3.2 **[2]**

8 **Explain** how blood glucose returns to normal after a period of fasting. D3.3.3 **[4]**

9 **Compare and contrast** type 1 and type 2 diabetes. D3.3.4 **[4]**

Type 1	Type 2

10 **Explain** how sweating cools the body. D3.3.6 **[3]**

Section C: Working with data

18 marks

All data in this section are invented for practice. The patterns are realistic.

11 D3.3.3, D3.3.4

Two people fasted and then drank the same dose of glucose. Their blood glucose was measured.

Time / hours	0	0.5	1	2	3	4
Person P / mg per 100 cm^3	82	140	150	100	85	80
Person Q / mg per 100 cm^3	145	230	290	330	290	240

a **Calculate** the percentage increase in glucose in person P from 0 to 1 hour. **[2]**

b **Compare** the responses of P and Q. **[3]**

c **Explain** the fall in blood glucose in person P after 1 hour. **[3]**

d Person Q's blood insulin was found to be above normal. **Deduce** the type of diabetes, giving a reason. **[2]**

12 D3.3.5, D3.3.6

A person moved from a warm room into a cold room for 40 minutes. Their skin temperature and core temperature were recorded.

Time / minutes	0	10	20	30	40
Skin temperature / °C	33.5	30.0	28.0	27.0	26.5
Core temperature / °C	37.0	36.9	36.8	36.9	37.0

a **Calculate** the change in skin temperature over 40 minutes. **[1]**

b **Explain** how a fall in skin temperature benefits the body. **[2]**

c **Explain** why core temperature stays almost constant, with two other responses. **[3]**

d **State** the receptors that detect the fall in temperature of the skin. **[1]**

e **Suggest** why a newborn baby is at greater risk in the same room. **[1]**

Section D: Longer answers

8 marks

13 **Describe** the role of thyroxin in regulating body temperature, starting at the hypothalamus. D3.3.5 **[4]**

14 **Outline** four ways to reduce the risk of type 2 diabetes, or to manage it. D3.3.4 **[4]**