D3.3 Homeostasis (HL)

What the Cell · DP Biology · worksheet · HL statements D3.3.7–11

Name _____ **Date** _____ **Total** _____ / 30

About 30 minutes, or one section at a time. The number of marks shows how many separate points to make.

Section A: Recall

6 marks

1 **Define** osmoregulation. D3.3.7 **[1]**

2 **Name** the part of the nephron where ultrafiltration takes place. D3.3.8 **[1]**

3 **Name** the gland that secretes ADH. D3.3.10 **[1]**

4 **State** where the osmoreceptors that control ADH secretion are found. D3.3.10 **[1]**

5 **State** two components of blood that are not found in the glomerular filtrate. D3.3.8 **[2]**

Section B: Understanding

12 marks

6 **Explain** how the structure of the glomerulus and Bowman's capsule produces the filtrate. D3.3.8 **[3]**

7 **Explain** how the cells of the proximal convoluted tubule are adapted for reabsorption. D3.3.8 **[3]**

8 **Explain** the role of the loop of Henle. D3.3.9 **[3]**

9 **Explain** how drinking a large volume of water changes the urine. D3.3.10 **[3]**

Section C: Working with evidence

8 marks

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

10 D3.3.8

Samples of blood plasma, glomerular filtrate and urine were analysed in a healthy person.

Concentration / g dm^{-3}	Plasma	Filtrate	Urine
Protein	75	0.05	0
Glucose	1.0	1.0	0
Urea	0.3	0.3	20
Sodium ions	3.2	3.2	3.5

a **Explain** why the filtrate contains almost no protein. **[1]**

b **Explain** the glucose concentrations in the filtrate and in the urine. **[2]**

c **Calculate** how many times more concentrated urea is in urine than in plasma. **[1]**

d **Explain** why urea becomes so concentrated in urine. **[2]**

e **Predict**, with a reason, how the urine would differ in a person with untreated diabetes and a plasma glucose of 3 g dm^{-3}. **[2]**

Section D: Longer answer

4 marks

11 **Explain** how blood flow to skeletal muscle and to the gut changes during vigorous exercise. D3.3.11 **[4]**