Osmoregulation Homework

Please practice these exam style questions, based on what we learnt.

uestion 1 (Multiple Choice / 1 Mark)

Which statement correctly defines osmoregulation in the human body?

- **A** Controlling the amount of oxygen in the blood.
- **B** Controlling the water and mineral ion balance in the blood and body fluids.
- **C** Controlling the core temperature of the body.
- **D** Controlling the level of glucose in the blood.

Question 2 (Fill in the Blanks / 3 Marks)

The kidneys filter the blood and change the concentration of urine depending on how much water a person drinks.

Use words from the box to complete the sentences below. Each word can be used once, more than once, or not at all.

| ADH | insulin | concentrated | diluted | less | more |

On a very hot day, a person loses a lot of water through sweating. This causes the brain to release a hormone called **(a)** _____.

This hormone travels to the kidneys and causes the kidney tubules to reabsorb **(b)** _____ water back into the blood.

As a result, the person will produce a small volume of dark, **(c)** _____ urine.

Question 3 (Data Interpretation / 3 Marks)

A student recorded the volume of urine they produced each day over four days, alongside the volume of water they drank.

Day	Water Drank (mL)	Volume of Urine Produced (mL)
Monday	1200	800
Tuesday	2500	1850
Wednesday	800	450
Thursday	1800	1100

(a) Calculate the difference in urine volume produced between Tuesday and Wednesday. [1 mark]

(b) On which day was the student's blood most likely to have the highest concentration of water? [1 mark]

(c) Name one way water is lost from the body naturally, other than in urine or sweat. [1 mark]

Question 4 (Structured Short Answer / 4 Marks)

The kidneys filter out waste products from the blood, but they also must keep useful substances.

(a) Name the toxic waste product made in the liver from excess amino acids that the kidneys must filter out. [1 mark]

(b) During filtration, glucose is squeezed out of the blood into the kidney tubules. Explain why 100% of this glucose is normally reabsorbed back into the blood. [2 marks]

(c) If a person's kidneys fail, they can be treated using a machine. State the name of this medical treatment. [1 mark]

Question 5 (Extended Writing / 6 Marks)

A person drinks three large glasses of water in a short space of time. Their body now has too much water in the blood.

Describe how the body detects this increase in water levels, and explain how the brain, hormones, and kidneys work together to bring the blood water levels back down to normal.
