

Excretion: practice questions

7 questions • 22 marks • mark scheme at the back

For Pearson Edexcel International GCSE Biology 4BI1 and Science (Double Award) 4SD0. **Biology only** is not in the Double Award and is only examined on Paper 2.

Name

Total / 22

1 Which of these is an excretory product and the organ that excretes it? [1 mark]

- A. ☐ Faeces from the large intestine
- B. ☐ Carbon dioxide from the lungs
- C. ☐ Glucose from the kidneys
- D. ☐ Protein from the skin

2 Name the excretory product lost from the lungs, and name two substances lost from the skin in sweat. [3 marks]

3 **Biology only** [1 mark]

Which tube carries urine from the kidney to the bladder?

- A. ☐ Renal vein
- B. ☐ Renal artery
- C. ☐ Ureter
- D. ☐ Urethra

4 **Biology only** [4 marks]

Describe how ultrafiltration happens in the Bowman's capsule and state what the glomerular filtrate contains.

5 **Biology only**

[4 marks]

The table shows the concentration of three substances in the blood plasma, the glomerular filtrate and the urine of a healthy person. (a) Explain why there is no protein in the glomerular filtrate. (b) Explain why there is no glucose in the urine. (c) Calculate how many times more concentrated urea is in the urine than in the plasma. Give your answer to the nearest whole number.

Concentration of substances (g per 100 cm ³)			
Substance	Blood plasma	Glomerular filtrate	Urine
Glucose	0.10	0.10	0.00
Protein	7.00	0.00	0.00
Urea	0.03	0.03	2.00

Answer =

6 **Biology only**

[6 marks]

On a hot day a person sweats a lot and does not drink. Explain how the body responds so that the water content of the blood is brought back towards normal, including the role of ADH and the kidney.

7

Biology only

[3 marks]

A person drinks a large volume of water. Describe the change in the urine they produce and explain how this happens in the collecting duct.

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Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

B B (1)

2. [3]

- carbon dioxide (1) allow water vapour
- one from: water / salts / ions / urea (1) allow sodium chloride
- a second different one from: water / salts / ions / urea (1)
- Max 3

3. [1] **Biology only**

C C (1)

4. [4] **Biology only**

- blood in the glomerulus is at high pressure (1)
- small molecules are forced out of the blood into the Bowman's capsule (1)
- filtrate contains any two of: water / glucose / urea / ions (1) allow salts for ions
- proteins and blood cells are too large so stay in the blood (1) allow any one named: proteins / blood cells / large molecules

5. [4] **Biology only**

- (a) protein molecules are too large to pass through (into the Bowman's capsule) (1)
- (b) all the glucose is reabsorbed into the blood (1) allow in the proximal convoluted tubule / by active transport
- (c) $2.00 \div 0.03$ (1)
- = 67 (times) (1) 66.7 or 66.67 (not rounded) scores 1 only; correct answer with no working scores 2

6. [6] **Biology only**

Level 3 5-6	A clear, logical explanation that links the fall in blood water content to ADH release, the change in collecting duct permeability, the amount of water reabsorbed and the resulting urine. Scientific terms are used accurately.
Level 2 3-4	Some of the sequence is explained, such as ADH being released and more water being reabsorbed, but links between steps are missing or one step is not explained.
Level 1 1-2	Isolated statements, such as more ADH is released or less urine is made, with little or no explanation.

Indicative content

- sweating lowers the water content of the blood
- the change is detected and the pituitary gland releases more ADH into the blood
- ADH travels in the blood to the kidney
- ADH makes the collecting duct more permeable to water
- more water is reabsorbed from the collecting duct into the blood
- a small volume of concentrated urine is produced
- the water content of the blood rises back to normal

7. [3] **Biology only**

- large volume of dilute urine (1)
- less ADH is released (1)
- collecting duct is less permeable, so less water is reabsorbed into the blood (1)