



EXAM PAPERS PRACTICE

Boost your performance and confidence with these topic-based exam questions

Practice questions created by actual examiners and assessment experts

Detailed mark scheme

Suitable for all boards

Designed to test your ability and thoroughly prepare you

Level: HL IB in Biology
Subject: Biology
Topic: IB HL Biology
Type: Topic Question

2002



1583

All International Baccalaureate IB Topic Questions HL Biology

BIOLOGY

HL - IB

Key skills

****Question 1****

Which of the following are roles of thyroxin?

- I. Targets metabolically active regions, such as adipose tissue.
- II. Increases the rate of protein synthesis.
- III. Inhibits the appetite and reduces food intake.
- IV. Increases the generation of body heat.

- A. II only
- B. I and II only
- C. II and IV only
- D. I, II, III, and IV

[1 mark]

****Question 2****

A one-year-old child displays fatigue and excessive thirst over a period of time. A urine test reveals the presence of glucose.

Which of the following would be the most likely diagnosis?

- A. Type I diabetes as the body is unable to respond to the presence of insulin.
- B. Type I diabetes as the beta cells in the islets of Langerhans were destroyed.
- C. Type II diabetes as the body does not have sufficient insulin receptors on target cells.
- D. Type II diabetes as the alpha cells in the islets of Langerhans were destroyed.

[1 mark]

****Question 3****

In which of the following scenarios would there be an increase in the breakdown of glycogen in the liver?

- A. When the beta cells of the islets of Langerhans secrete insulin.
- B. When the beta cells of the islets of Langerhans secrete glucagon.
- C. After eating a meal high in carbohydrates.
- D. When the alpha cells of the islets of Langerhans secrete glucagon.

[1 mark]

****Question 4****

Which of the following is not a reason why organisms need to maintain a safe balance of water and solutes in their cells?

- A. Cell damage might occur due to osmosis.
- B. Cells with a higher osmolarity than their surroundings will lose water and shrink.
- C. Cells with a higher osmolarity than their surroundings will gain water and could burst.
- D. Cells with a lower osmolarity than their surroundings will lose water and shrink.

[1 mark]

****Question 5****

Which of the following statements describe features that aid the process of ultrafiltration?

- I. The glomerulus has an afferent arteriole and an efferent arteriole.
- II. The blood in the afferent arteriole has a different composition to the blood in the efferent arteriole.
- III. The basement membrane prevents the passage of large proteins out of the glomerulus.
- IV. The afferent arteriole is wider than the efferent arteriole.

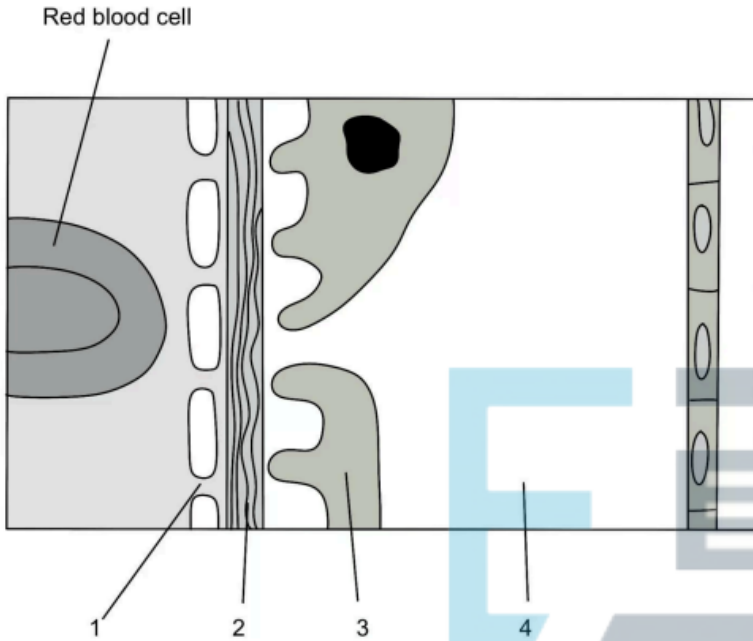
- A. I and II only
- B. II and III only
- C. III only
- D. III and IV only

[1 mark]



****Question 6****

The image below shows a section through the lining of the glomerulus and Bowman's capsule.



Identify the structures labeled 1–4 in the image above.

	1	2	3	4
A	Podocyte	Basement membrane	Capillary endothelium	Inside of capillary
B	Fenestration in the basement membrane	Capillary endothelium	Podocyte	Bowman's capsule lumen
C	Fenestration in the capillary endothelium	Basement membrane	Podocyte	Bowman's capsule lumen
D	Fenestration in the capillary endothelium	Basement membrane	Podocyte	Inside of proximal convoluted tubule

[1 mark]



****Question 7****

The table below shows the composition of blood plasma as it enters the glomerulus.

	Concentration / mol dm ⁻³ OR mg dm ⁻³
Urea	5
Na ⁺ ions	150
Glucose	5
Protein*	740

Which of the following is a possible correct composition of the glomerular filtrate of a healthy individual?

	Urea	Na ⁺ ions	Glucose	Protein
A	5	150	5	740
B	5	150	5	2
C	5	6	5	740
D	5	6	5	2

Copyright © 2021 Exam Papers Practice

[1 mark]

****Question 8****

Water leaves the descending limb of the loop of Henlé by osmosis.

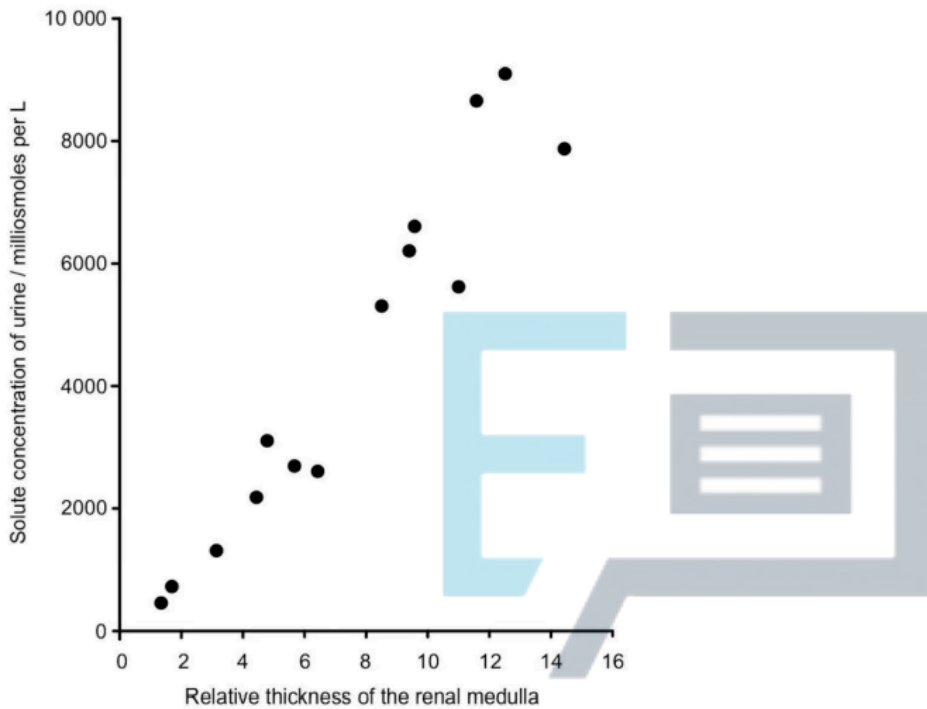
Which is the correct reason for this?

- A. Ions are pumped out of the ascending limb of the loop of Henlé, raising the osmolarity of the surrounding medulla.
- B. Ions are pumped out of the descending limb of the loop of Henlé, raising the osmolarity of the surrounding medulla.
- C. Ions are pumped out of the ascending limb of the loop of Henlé, lowering the osmolarity of the surrounding medulla.
- D. Water is reabsorbed into the vasa recta from the surrounding medulla.

[1 mark]

****Question 9****

Which is the correct explanation for the relationship between urine solute concentration and relative medullary thickness shown in the graph below?

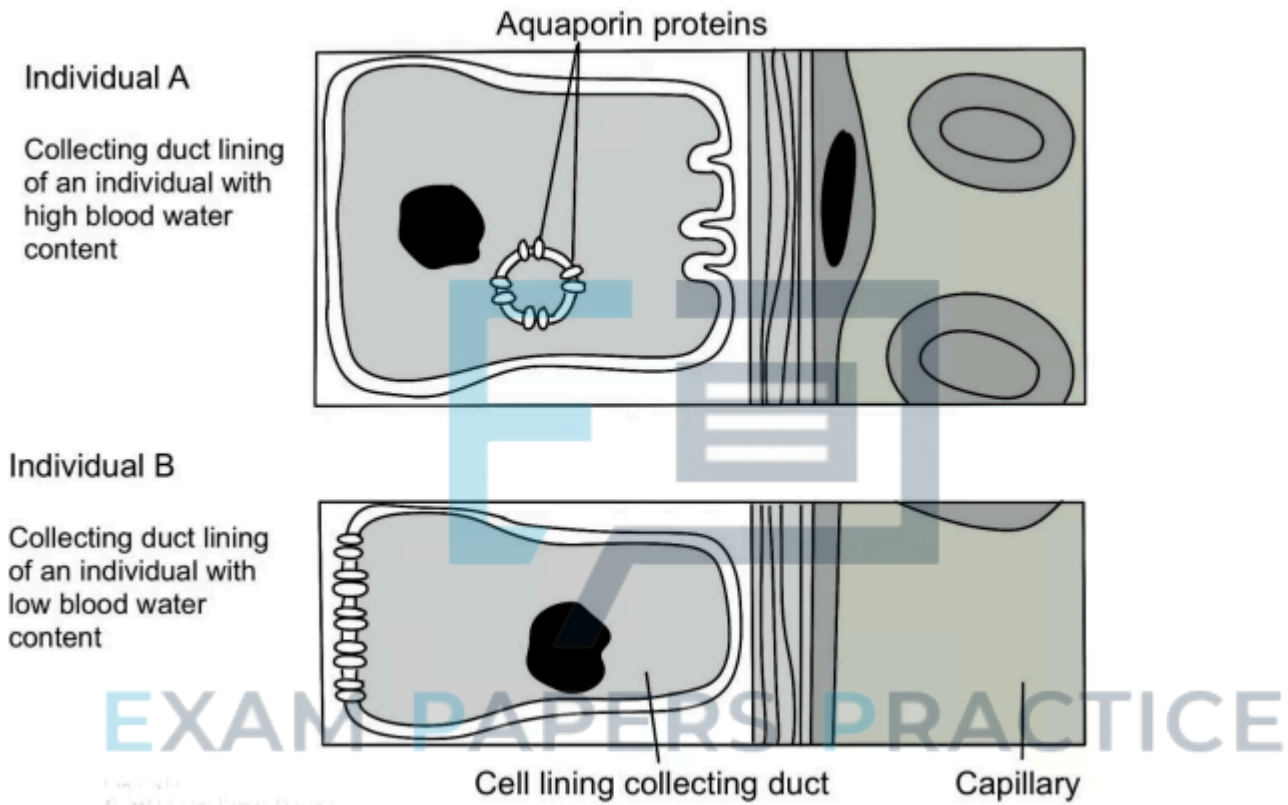


- A. A thicker medulla provides space for more kidney nephrons.
- B. A thicker medulla allows for longer kidney nephrons.
- C. A thicker medulla allows for longer loops of Henlé.
- D. A thicker medulla allows more blood to be filtered by the kidney.

[1 mark]

****Question 10****

The image below shows the appearance of the cells that line the collecting duct when a healthy human has high blood water content (A) and low blood water content (B). Note that aquaporins are transport proteins that allow the passage of water molecules.



Which of the following correctly explains the difference between the collecting duct cells of individual A and individual B?

- A. There is more ADH in the blood of individual B.
- B. There is less ADH in the blood of individual B.
- C. Individual B has a longer loop of Henlé.
- D. The collecting duct of individual B descends further into the medulla where the concentration gradient is steepest.

[1 mark]