EXAM PAPERS PRACTICE

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Designed to test your ability and

6.1 Digestion & Absorption

Hard

BIOLOGY

IB HL

6.1 Digestion & Absorption

Question Paper

Course	DP IB Biology
Section	6. Human Physiology
Topic	6.1 Digestion & Absorption
Difficulty	Hard

Time allowed: 10

Score: /5

Percentage: /100

Question 1

Sucrase-isomaltase is a membrane-bound disaccharidase located in the cell surface membranes of the cells lining the small intestine. It digests the following molecules:

- Dextrins
- Glucose-glucose disaccharides
- Glucose-frustose disaccharides

A recessive mutation leads to congenital sucrase-isomaltase deficiency (CSID). Which of the following are likely to be symptoms of CSID?

I. Diarrhoea due to water retention in the digestive tract.

II. Bacterial fermentation of undigested sucrose.

III. Difficulty digesting dairy products.

IV. Difficulty digesting starchy foods.

A. I, II, and III only.

B. I, II, and IV only.

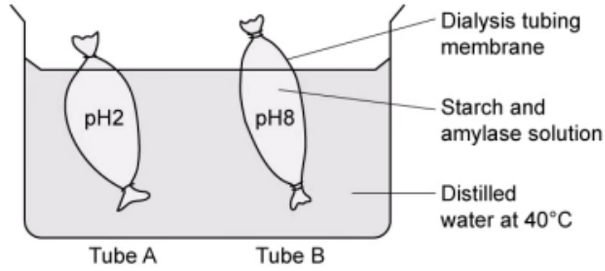
C. II, III, and IV only.

D. II and IV only.

[1 mark]

Question 2

An experiment was set up to model the digestion of starch in the small intestine. It was set up as follows:



Tube A	Tube B
• 1 ml of 1 % amylase solution • 10 ml of 1 % starch solution • 5 ml of pH 2 buffer	• 1 ml of 1 % amylase solution • 10 ml of 1 % starch solution • 5 ml of pH 8 buffer

Which statements regarding the experiment shown are correct?

I. The dialysis tubing perfectly represents the lining of the small intestine.
II. The iodine test in and around tube A would yield a blue-black colour inside the tubing and a brown-yellow colour outside the tubing.
III. The Benedict's test in and around tube B would yield an orange precipitate inside the tubing and a blue colour outside the tubing.
IV. The distilled water imperfectly represents the blood.

A. I, II, and III only.

B. II, III, and IV only.

C. II and IV only.

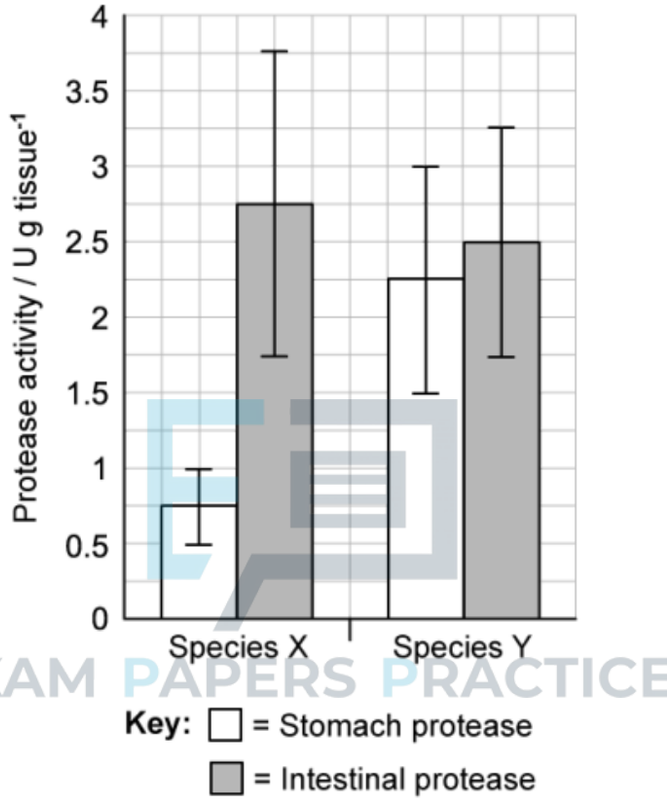
D. IV only.

[1 mark]

Question 3

The activity of two types of protease enzymes was measured in two different species of fish; species **X** and species **Y**. The results of the research are shown in the graph.

The unit U denotes the enzyme required for the production of 1 μmol of product per minute. The bars represent the standard deviation.



Which statement about protease enzymes is correct?

A. The activity of the stomach protease of species **Y** is 2.5 times greater than that of species **X**.

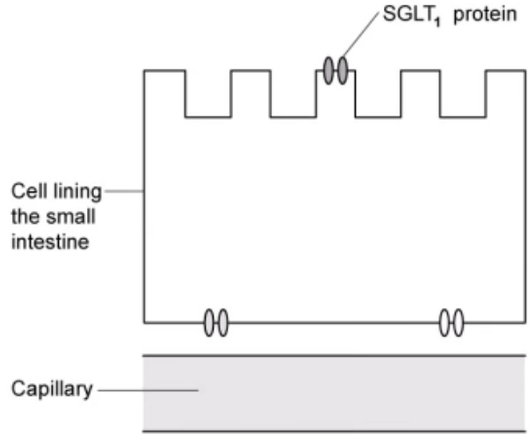
B. The activity of the intestinal protease of species **X** is significantly higher than the stomach protease of species **X**.

C. Endopeptidase proteases hydrolyse peptide bonds at the ends of polypeptides.

D. The activity of the intestinal proteases of both species **X** and **Y** are significantly higher than the stomach proteases.

Question 4

Inhibition of a transport protein known as SGLT1 has been studied as a possible treatment option for the treatment of type 2 diabetes. The diagram shows the location of SGLT1, alongside two other types of transport protein.



Which statement regarding the impact of inhibiting SGLT1 is likely to be true?

A. It will prevent the active transport of glucose into the epithelial cell.

B. It will increase the release of insulin from the pancreas.

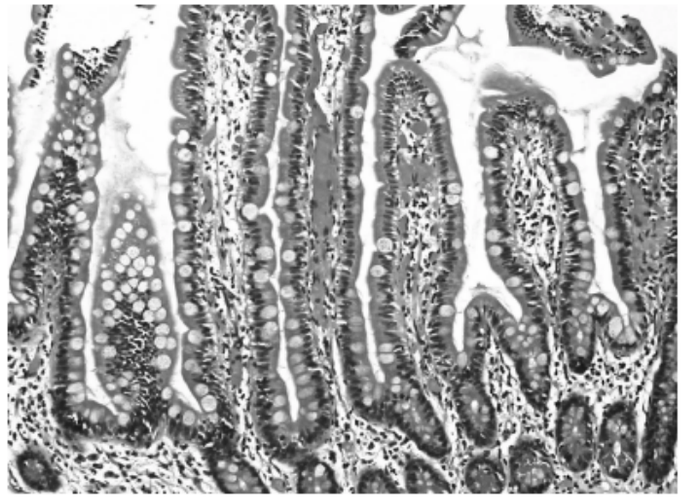
C. It will prevent the formation of a glucose gradient between the epithelial cell and the capillary.

D. It will prevent the formation of a sodium ion gradient between the intestine lumen and the epithelial cell.

[1 mark]

Question 5

The micrograph image below shows a transverse section through the wall of the small intestine.



Which tissue layers can be identified in the image?

A. Mucosa and sub-mucosa only.

B. Submucosa and muscle layer only.

C. Mucosa, submucosa, and muscle layer only.

D. Mucosa, submucosa, muscle layer, and serosa.

[1 mark]