

GCSE Biology (9 – 1)

Digestive System

Name:

Group:

Instructions

- Read each question carefully before you begin to answer it.
- Use black ink or black ball-point pen for your answers.
- Fill in the boxes at the top of this page with your name and group.
- Attempt to answer every question in the booklet.
- Answer the questions in the spaces provided – there may be more space than you need in some answer spaces.
- Calculators may be used for this booklet.
- For any calculations, you **must** show all your working.
- Any and all drawings or graphs should be completed in pencil.



For markers use	
Question	Mark
1	/5
2	/14
3	/3
4	/6
5	/13
6	/5
Total	/46
%	
Grade	

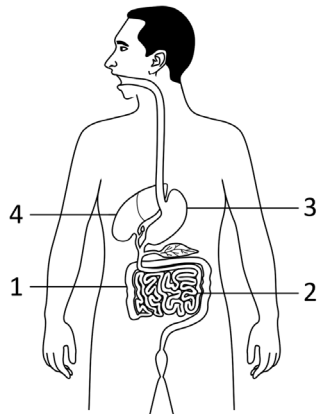
Information

- The maximum mark for this paper is 46 marks.
- The marks for each question are shown in brackets.
- Please be aware that good English and clear presentation are required in your answers.



1. Below are five questions related to the processes that occur within the human digestive system.
Circle the correct answer for each question.

- a. The figure below shows the human digestive system. Which part absorbs the most water?



Circle the number of the correct answer.

1

2

3

4

(1 mark)

- b. Which organ produces bile, which emulsifies lipids?

Circle the letter of the correct answer.

Pancreas

Liver

Gallbladder

Small intestine

A

B

C

D

(1 mark)

- c. Which organ is the primary site for the absorption of digested food molecules into the bloodstream?

Circle the letter of the correct answer.

Stomach

Large intestine

Oesophagus

Small intestine

A

B

C

D

(1 mark)

- d. Which enzyme is responsible for the breakdown of carbohydrates in the mouth?

Circle the letter of the correct answer.

Protease

Lipase

Amylase

Maltase

A

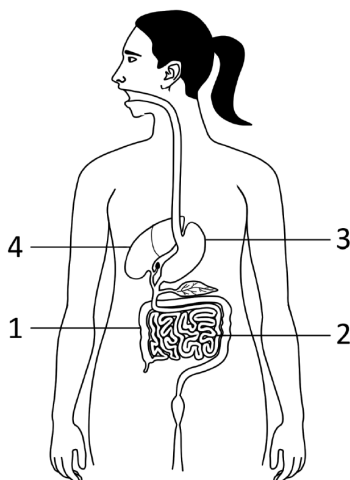
B

C

D

(1 mark)

- e. Which organ secretes hydrochloric acid? Circle the number of the correct answer.



Circle the number of the correct answer.

1

2

3

4

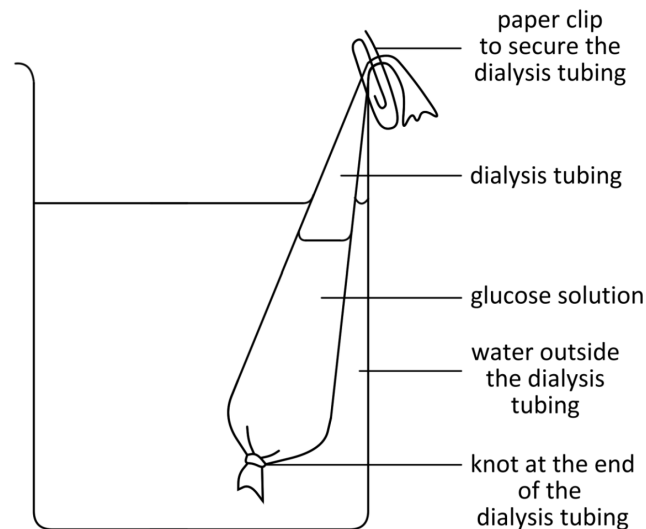
(1 mark)

(Total for Question 1 is 5 marks)

2. Dialysis tubing has an artificial membrane.

This membrane shares similar properties with the natural lining of the intestine.

A student conducted an experiment to investigate the diffusion of glucose through dialysis tubing by using the apparatus shown in the figure below.



At 10-minute intervals, the student collected water samples from around the dialysis tubing. These samples were then tested using Benedict's solution. The student's results are shown in the table below.

Time in minutes	Colour of Benedict's sample
0	Blue
10	Green
20	Orange
30	Brick red

- a) Describe and explain the student's results shown in the table above.

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(3 marks)

- b) The student then conducted the same investigation, but with a higher concentration of glucose inside the dialysis tubing. Based on this change, predict the results they would observe.

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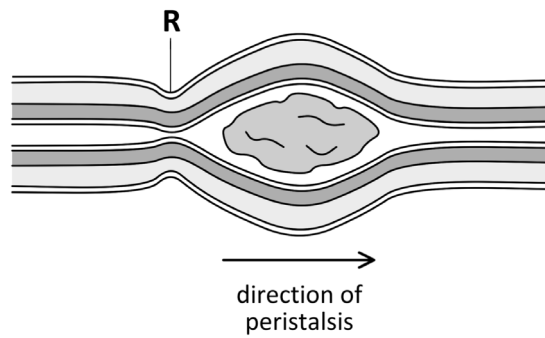
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(3 marks)

The figure below shows part of the small intestine during peristalsis.



c) In terms of muscles, describe what is happening at R.

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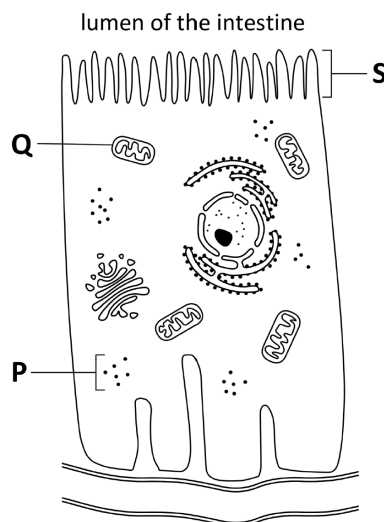
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(2 marks)

The figure below shows a sketch of a cell from the lining of the small intestine. The lumen is the space inside the intestine where food is digested.



d) Identify the three labelled structures shown in the figure above. For each structure, describe its function within the intestinal cell.

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[illegible]

(Total for Question 2 is 14 marks)

3. Tissues, organ and organ systems have different functions within an organism.

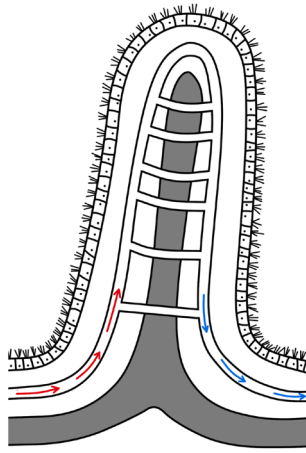
Draw a line from each structure to its correct scientific name.

Structure	Name
Layer of cells lining the stomach	An organ
Stomach	An organism
Mouth, stomach, intestines, liver and pancreas	An organ system
	A tissue

(3 marks)

(Total for Question 3 is 3 marks)

4. The figure below shows a villus from the small intestine.



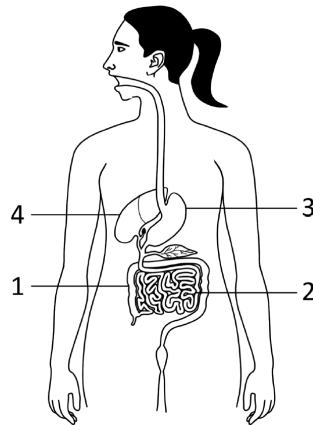
Describe how the structure of a villus is adapted to its function in absorption of the products of digestion.

[illegible]

(6 marks)

(Total for Question 4 is 6 marks)

5. The figure below shows the human digestive system.



a) Identify the structures numbered 1 to 4 in the figure above.

1 = ...

2 = ...

3 = ...

4 = ...

(2 marks)

A student wanted to investigate how bile affects the digestion of fat in milk. They used three test tubes in their experiment.

- i. Test tube 1 which contained milk and bile only.
- ii. Test tube 2 which contained milk and lipase.
- iii. Test tube 3 which contained milk, lipase, and bile.

The student then used a pH indicator that changes colour depending on the acidity of the solution. This indicator is pink in alkaline conditions and turns colourless in acidic conditions. The same volume of this indicator was added to each test tube.

The student then recorded the colour of the solution in each test tube at the start of the experiment, after 25 minutes, and after 50 minutes. The results of these observations are shown in the table below.

Test tube	Indicator colour		
	0 minutes	25 minutes	50 minutes
1	Pink	Pink	Pink
2	Pink	Pink	Colourless
3	Pink	Colourless	Colourless

b) Explain the results that were obtained from test tubes 2 and 3.

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(4 marks)

c) Explain the purpose of test tube 1 in the student's experiment.

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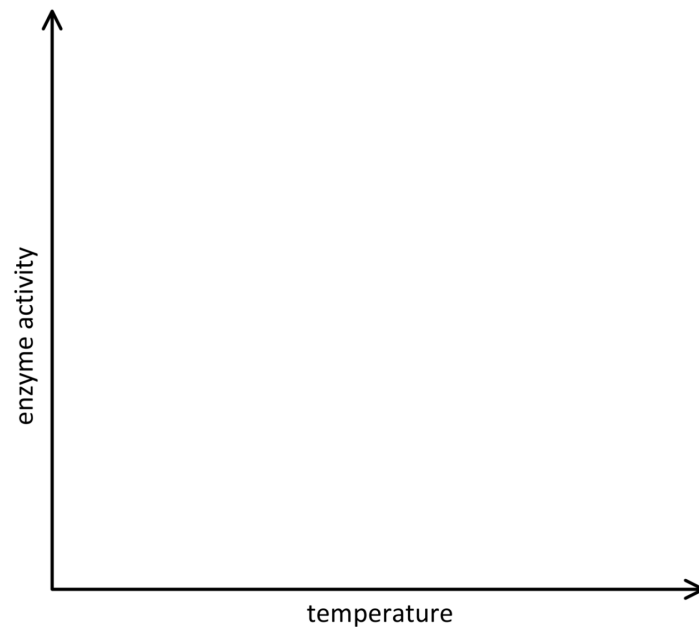
(2 marks)

d) The action of lipase is affected by temperature.

The figure below shows the axes for a graph of the effect of temperature on the activity of lipase.

Complete the graph by:

- i. Drawing a line to show the expected effect of temperature on the activity of lipase.
- ii. Adding a label line and a label to show the point at which all the lipase has been denatured.



(2 marks)

e) Explain, in terms of active sites, why lipase enzyme cannot be used to catalyse the breakdown of proteins.

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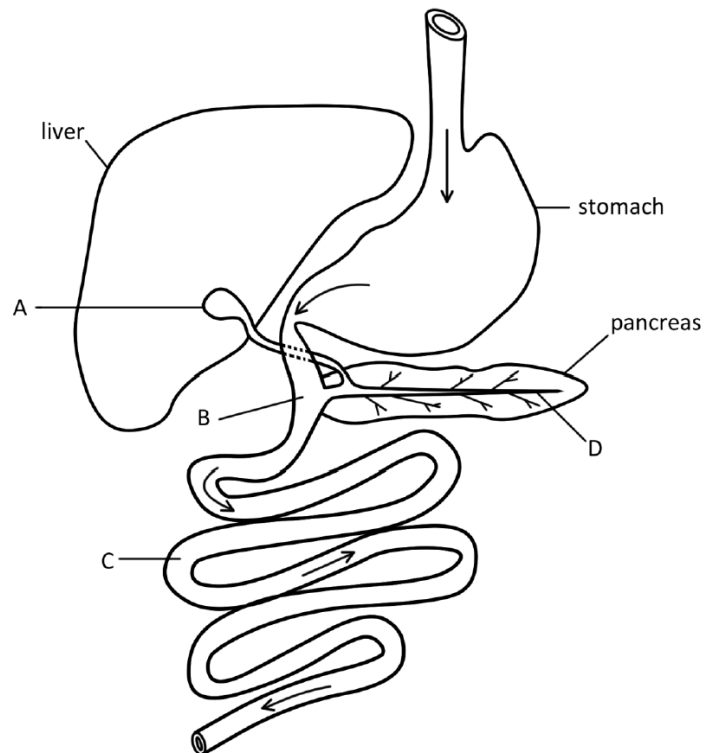
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(3 marks)

(Total for Question 5 is 13 marks)

6. The figure below shows part of the human digestive system.
Use the figure below to answer the following questions.



- a) Identify the structures labelled in the figure above.

A = ...

B = ...

C = ...

D = ...

(2 marks)

- b) Give the name of the enzyme that digests lipids.

.....

(1 mark)

- c) State the products of the chemical digestion of lipids and give the location where this reaction occurs.

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(2 marks)

(Total for Question 6 is 5 marks)