

Write your name here

Surname

Other names

**Pearson Edexcel**  
**International GCSE**

Centre Number

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Candidate Number

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# Human Biology

**Unit: 4HB0**

**Paper: 02**

Friday 9 January 2015 – Morning

**Time: 1 hour**

Paper Reference

**4HB0/02**

**You must have:**

Ruler

Candidates may use a calculator.

Total Marks

## Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- Show all the steps in any calculations and state the units.

## Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

## Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Write your answers neatly and in good English.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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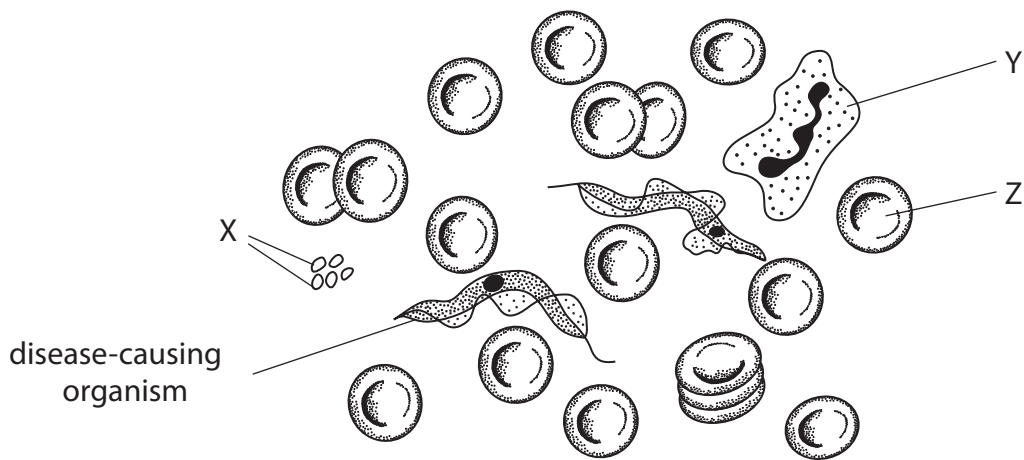
**PEARSON**

**Answer ALL questions.**

1 (a) (i) Name a disease caused by bacteria. (1)

(ii) Name a disease caused by fungi. (1)

(b) The diagram shows a sample of blood as seen using a microscope.  
The blood was taken from a person suffering from a disease.



The disease-causing organisms shown in the diagram obtain nutrients from a living person.

(i) State the general name for organisms that feed in this way. (1)

(ii) Name two food substances that the disease-causing organism obtains from human blood. (2)

1 .....

2 .....



(iii) Name the structures labelled Y and Z.

(2)

Y .....

Z .....

(iv) Describe two differences in structure between Y and Z.

(2)

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.....  
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(v) Describe two differences in function between Y and Z.

(2)

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(vi) Name blood component X.

(1)

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(vii) Describe the role of component X in protecting the body.

(3)

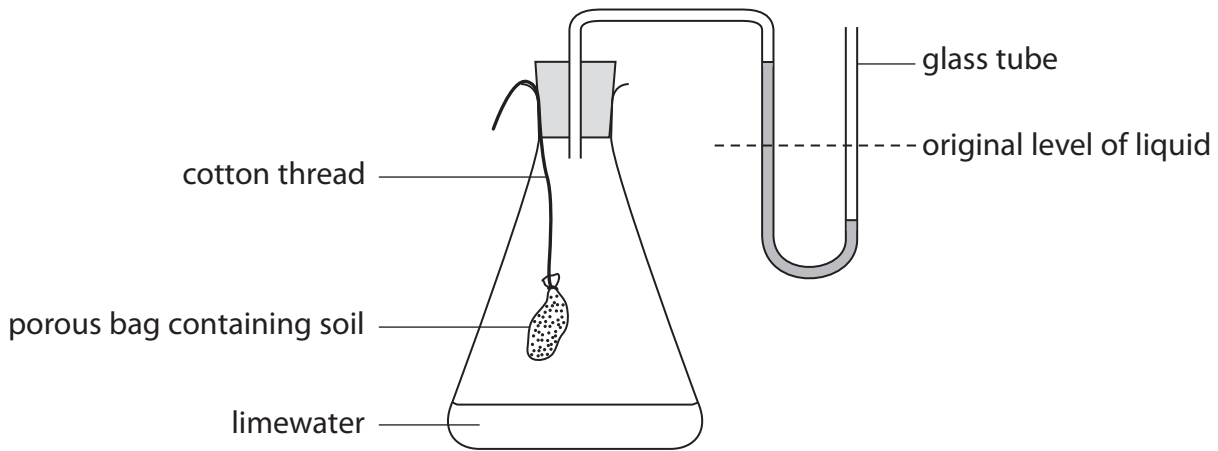
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**(Total for Question 1 = 15 marks)**



2 The diagram shows apparatus used in an investigation of a soil sample containing a large number of bacteria.

The investigation has been in progress for 24 hours.



(a) (i) The bacteria produce a gas that reacts with the limewater.

Name this gas.

(1)

(ii) State how you can see that this gas has reacted with the limewater.

(1)

(b) At the start of the experiment the levels of the liquid in the tube are the same.

After 24 hours the levels have changed as shown in the diagram.

Suggest why this change occurs.

(4)



(c) (i) State one variable that should be kept constant during the investigation. (1)

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(ii) Explain why this variable should be kept constant. (2)

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(d) Describe an experiment to show that it is the action of the bacteria in the soil sample that causes the change in the level of liquid in the tube. (3)

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**(Total for Question 2 = 12 marks)**



**3** Describe the structure of DNA.

(8)

Dotted lines for writing the answer.

**(Total for Question 3 = 8 marks)**



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4 The inheritance of blood groups is controlled by three alleles,  $I^A$ ,  $I^B$  and  $I^O$

$I^A$  and  $I^B$  are codominant, but both are dominant over  $I^O$

These alleles are not sex-linked.

(a) Explain what is meant by the term **codominant**.

(2)

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(b) Explain what is meant by the term **sex-linked**.

(2)

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(c) A man is blood group A and his wife is blood group B. They have four children, each with a different blood group.

Draw a genetic diagram to show the inheritance of blood group in this family.

(4)





(d) The man and his wife have a fifth child.

(i) What is the probability that this child will be blood group O?

(1)

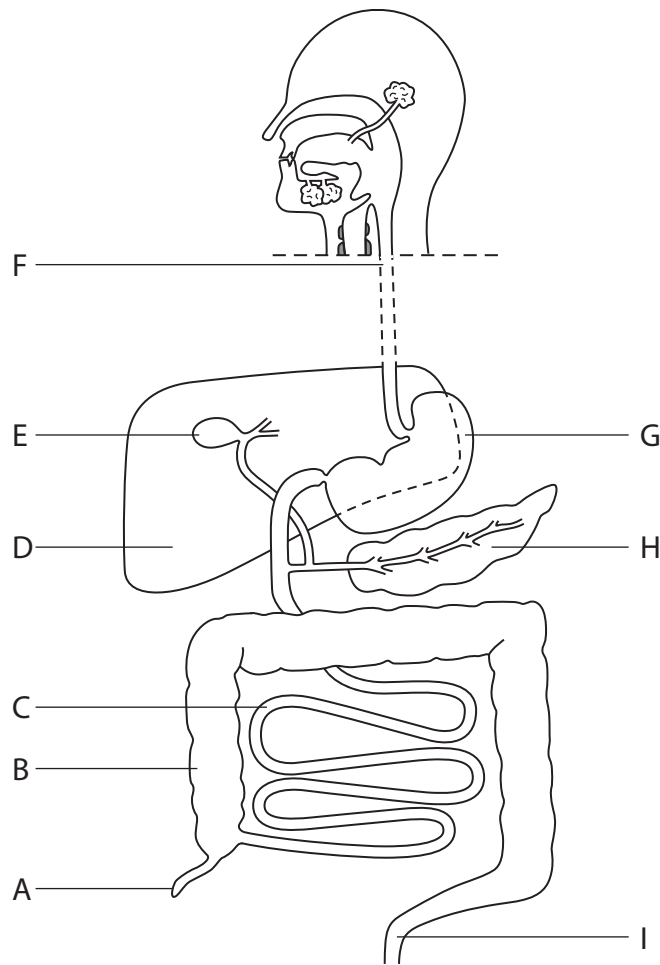
(ii) What is the probability that this child will be a boy?

(1)

**(Total for Question 4 = 10 marks)**



5 The diagram shows structures of the human digestive system. These structures are represented with letters A to I.



(a) The table lists functions of the human digestive system.

For each of the functions listed, select the letter that links the function to its correct structure.

The first one has been done for you.

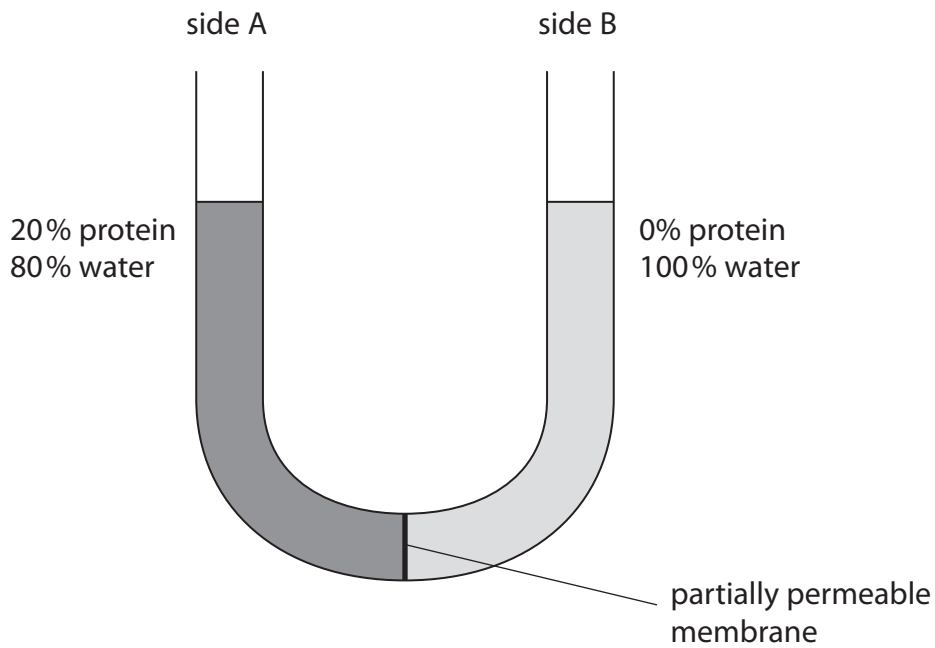
(5)

Function	Structure
stores faeces	I
stores bile	
absorbs water from undigested food	
absorbs the products of digestion	
begins the process of protein digestion	
produces urea	





- 6 The diagram shows a piece of apparatus used to investigate the process of osmosis.  
A protein solution was poured into side A and water was poured into side B.



- (a) Explain, in terms of water potential, why the percentage of water changes in side A after 30 minutes.

(3)

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(b) Explain any changes in the percentage of protein in side B after 30 minutes.

(2)

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(c) Explain any changes in the percentage composition of the protein solution in side A after 30 minutes.

(2)

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**(Total for Question 6 = 7 marks)**

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**TOTAL FOR PAPER = 60 MARKS**



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