Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | | | | | |

Candidate Number | | | | |

Tuesday 15 January 2019

Afternoon (Time: 1 hour) | Paper Reference **4HB0/02**

Human Biology

Unit: 4HB0

Paper: 02

You must have:
Ruler
Candidates may have 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.
- 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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Answer ALL questions.

1 Diseases have different causes and can be transmitted in different ways.

The boxes give some diseases and some features of these diseases.

Draw one straight line from each disease to its correct feature.

(6)

Disease	Feature
typhoid	caused by a fungus
malaria	caused by schistosoma
thrush	spread by houseflies
gonorrhoea	spread by mosquitoes
tuberculosis	sexually transmitted
poliomyelitis	lung infection
bilharzia	caused by a virus

(Total for Question 1 = 6 marks)

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2 (a) A student investigates whether it is easier to identify food by taste and smell, rather than by taste alone.

She uses this method.

- cover the eyes of ten people
- place a piece of apple or a piece of onion on each person's tongue
- ask each person to state whether it is a piece of apple or a piece of onion
- test each person 20 times
- record the number of correct responses
- repeat the investigation with each person wearing a clip to close their nostrils as well as having their eyes covered

The table shows the student's results.

	Number of correct responses	
Person	**Eyes covered**	**Eyes covered and nostrils closed**
1	18	13
2	17	10
3	14	15
4	16	13
5	19	9
6	17	8
7	12	8
8	17	10
9	15	7
10	15	7

(i) State why the people in the investigation have their eyes covered.

(1)

.....

.....

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(ii) The percentage of correct responses for eyes covered and nostrils closed is 50%.

Calculate the percentage of correct responses for eyes covered only.

(3)

percentage = ... %

(iii) Give three conclusions that can be made from the student's results.

(3)

1 .....

.....

2 .....

.....

3 .....

.....

(iv) State three factors that the student should keep constant during her investigation.

(3)

1 .....

.....

2 .....

.....

3 .....

.....

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(b) Explain why ten people are used in the investigation rather than just one person.

(2)

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(c) Give one sense, other than smell or taste, that can be used to identify food when it is in the mouth.

(1)

.....

(Total for Question 2 = 13 marks)

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3 (a) Excess nitrogen in animals can be excreted in three different molecules.

These molecules are ammonia, urea and uric acid.

In humans, urea is the main excretory product.

(i) Describe how urea is formed in humans.

(3)

(ii) Table 1 gives some properties of the three excretory products.

	Ammonia	Urea	Uric acid
Solubility	very high	high	very low
Toxicity	high	medium	low
Number of molecules of ATP needed to excrete one molecule	0	4	8

Table 1

Using information in Table 1, explain why urea is the main molecule for nitrogen excretion in humans.

(4)

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(iii) Describe the difference between urine and urea.

(3)

(b) Table 2 shows the concentration of urea in the blood of a person over a period of 16 hours.

For the first 8 hours the person's kidneys are working normally.

After 8 hours the person's kidneys stop working.

	Kidneys working			Kidneys not working	
Time in hours	0	4	8	12	16
Concentration of urea in blood in arbitrary units	100	100	100	150	220

Table 2

(i) State the part of the blood that carries urea.

(1)

(ii) State two conclusions that can be made from the information in Table 2.

(2)

1

2

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(c) Some people have permanent kidney failure.

State two treatments that can be used for a person who has permanent kidney failure.

(2)

1 .....

.....

2 .....

.....

(Total for Question 3 = 15 marks)

4 Describe the processes that move substances in and out of cells.

In your answer, include the factors that affect these processes.

(8)

(Total for Question 4 = 8 marks)

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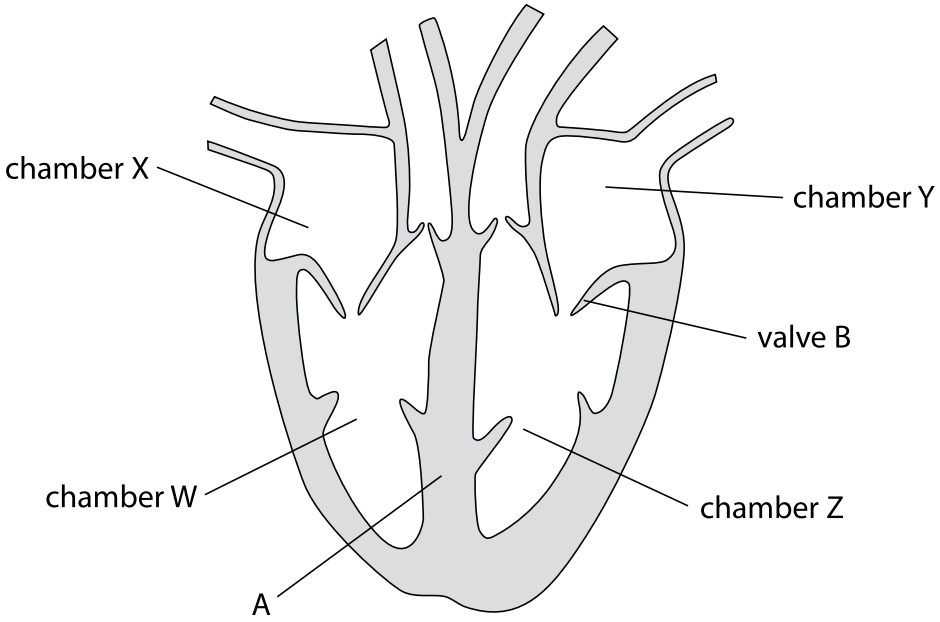
5 The diagram shows an outline of a human heart.



(a) (i) The table gives some functions of the heart.

Complete the table by giving the correct chamber, W, X, Y or Z, for each function.

(4)

Function	Chamber
receives oxygenated blood	
sends blood to the lungs	
receives deoxygenated blood	
sends blood to the body	

(ii) Describe the function of valve B.

(2)

(b) Some babies are born with a hole in the heart. This occurs when there is a hole in the septum between the right side of the heart and the left side of the heart.

This hole can occur at point A on the diagram.

Explain the possible effects of a hole in the heart.

(4)

(Total for Question 5 = 10 marks)

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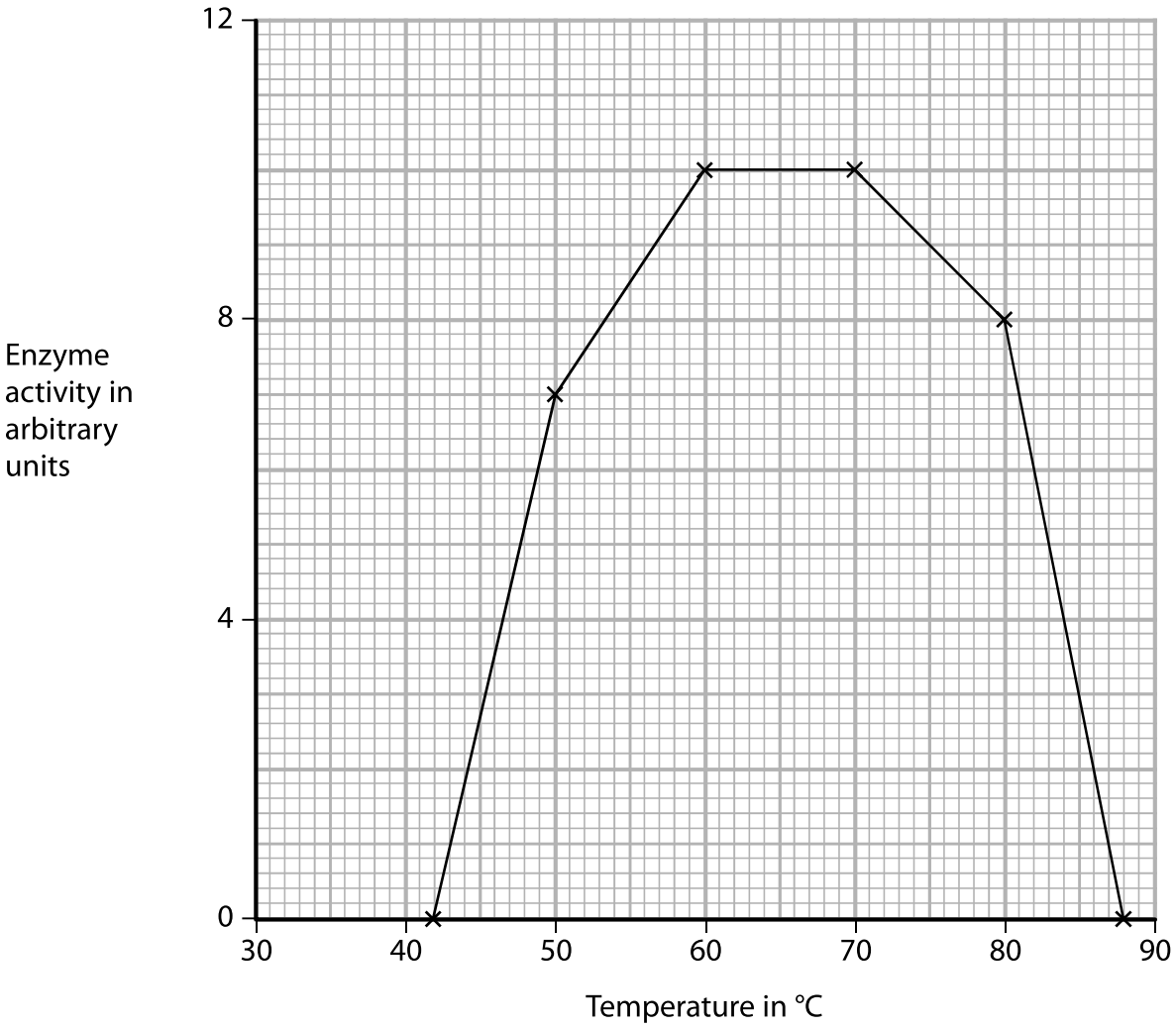
6 A student investigates the effect of temperature on enzyme activity.

The graph shows the student's results.



(a) State the independent variable in this investigation.

(1)

.....

(b) Using information from the graph, explain why this enzyme is not from a human.

(4)

(c) Explain the shape of the graph above 70 °C.

(3)

(Total for Question 6 = 8 marks)

TOTAL FOR PAPER = 60 MARKS

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