

Please check the examination details below before entering your candidate information

Candidate surname					Other names				
Centre Number					Candidate Number				

Pearson Edexcel International GCSE (9–1)

Tuesday 9 June 2026

Afternoon (Time: 1 hour 45 minutes)

Paper reference **4HB1/02**

Human Biology

UNIT: 4HB1

Paper: 02

You must have:

Ruler

Candidates may use a calculator

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **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 90.
- 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 (a) The box gives the names of molecules found in the body.

ADH	DNA	glucagon	glycogen
LH	lipids	maltose	pepsin
RNA	starch		

The table lists information about some biological molecules.

Use molecules from the box to complete the table.

(6)

Information	Molecule
is found in chromosomes	
is a reducing sugar	
contains glycerol	
is a storage carbohydrate in the liver	
is an enzyme	
helps to control blood glucose levels	

(b) Describe how to test a substance to show that it is a reducing sugar.

(4)

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(Total for Question 1 = 10 marks)

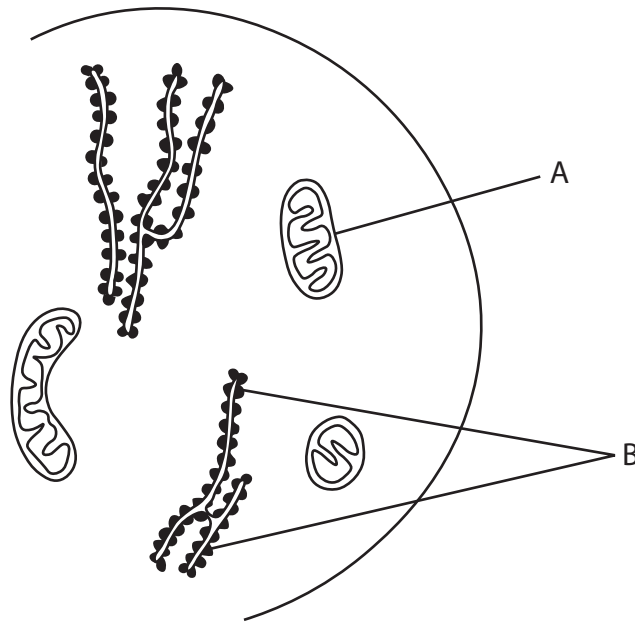


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2 The diagram shows part of a cell from the lining of a cheek.



(a) (i) Identify parts A and B.

(2)

A

B

(ii) Give a function for parts A and B.

(2)

A

B

(b) Explain how it is possible to tell that the diagram shows the cytoplasm and not the nucleus.

(2)

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(c) Explain how you can tell that this diagram has been produced using an image from an electron microscope rather than a light microscope.

(4)

(d) Cells can form tissues and organs.

(i) Describe what is meant by the term **tissue**.

(2)

(ii) Describe what is meant by the term **organ**.

(2)

(Total for Question 2 = 14 marks)

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(b) State a safety precaution needed in this investigation.

(1)

(c) Estimate the mean tidal volume, in dm^3 , between J and K.

(1)

mean tidal volume = dm^3

(d) Determine the rate of breathing, in breaths per minute, between J and K.

(4)

rate = breaths per minute



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(e) Determine the vital capacity, in dm^3 , of the person whose breathing was recorded. (2)

vital capacity = dm^3

(f) The person whose breathing was recorded repeated the investigation after running for five minutes.
Describe how the trace between J and K would be different. (2)

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(Total for Question 3 = 14 marks)



4 Read the passage below.

Use the information in the passage and your own knowledge to answer the questions that follow.

Many people take legal drugs as painkillers for mild pain. For more severe pain, doctors can prescribe stronger painkillers, such as co-codamol. This painkiller contains two active ingredients called paracetamol and codeine. Codeine belongs to the class of drugs known as opioids, which are pain relievers.

- 5 Opioids can cause addiction and a person may get withdrawal symptoms if they suddenly stop taking the drugs. Patients are, however, advised not to take co-codamol for longer than the time prescribed by their doctor. Patients should not take higher or more frequent doses than prescribed.

- 10 Codeine is converted into morphine in the liver by an enzyme. It is the morphine that causes the pain relief. In some people the morphine is produced in very small amounts or produced very slowly. However, in other people higher amounts of morphine are produced.

- 15 Whilst taking co-codamol, patients should not take any other medicines containing paracetamol. Women should not take co-codamol if they are pregnant or breast feeding. Co-codamol is not recommended for patients with severe kidney problems.

- (a) State what is meant by the term **addiction** (lines 5 and 6).

(2)

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(b) State what is meant by withdrawal symptoms (line 5).

(2)

(c) Suggest why the liver of some people produces too much, or too little, morphine (lines 10 to 12).

(2)

(d) Suggest why patients should not take paracetamol when taking co-codamol (lines 13 to 14).

(2)

(e) (i) Explain why women should not take co-codamol if they are pregnant (line 14).

(2)



- (ii) Explain why women should not take co-codamol if they are breastfeeding (lines 14 and 15).

(2)

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- (f) Give a reason why a patient with severe kidney problems should not take co-codamol (lines 15 and 16).

(1)

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(Total for Question 4 = 13 marks)

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5 Water moves in and out of cells by osmosis.

(a) State two other ways molecules move in and out of cells.

(2)

1

2

(b) A student investigates the effect of different concentrations of sucrose solution on the masses of potato cubes.

This is the student's method.

- obtain five cubes of potato, each with a mass of 5.0 g
- place a different concentration of sucrose solution into each of four test tubes
- place distilled water into a fifth test tube
- place a cube of potato into each test tube
- remove the cubes after 30 minutes, wipe them with tissue paper and measure the mass of each cube

The table shows the student's results.

Concentration of sucrose solution in arbitrary units	Mass of potato cube in g
0.0	5.7
0.2	5.2
0.4	4.6
0.5	4.3
0.8	3.3

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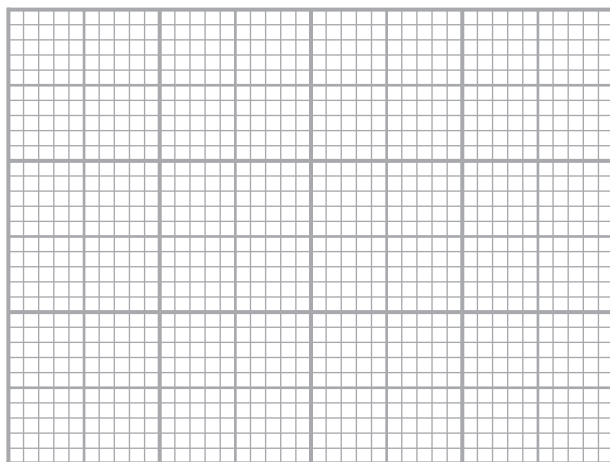


(i) Plot the student's results on the grid.

(4)

(ii) Draw a line of best fit for the points on the graph.

(1)



(iii) State two variables, other than the initial mass of the cubes, that should be kept constant during the investigation.

(2)

1

2

(iv) Explain why the cubes were wiped with tissue paper when they were removed from the test tubes.

(2)

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- (c) (i) Explain the results of this investigation for concentrations of sucrose solution of 0.0 arbitrary units and 0.2 arbitrary units.

(3)

- (ii) Using information from the graph, determine the concentration of sucrose solution when there is no change in the mass of the potato.

(1)

concentration of sucrose = arbitrary units

(Total for Question 5 = 15 marks)

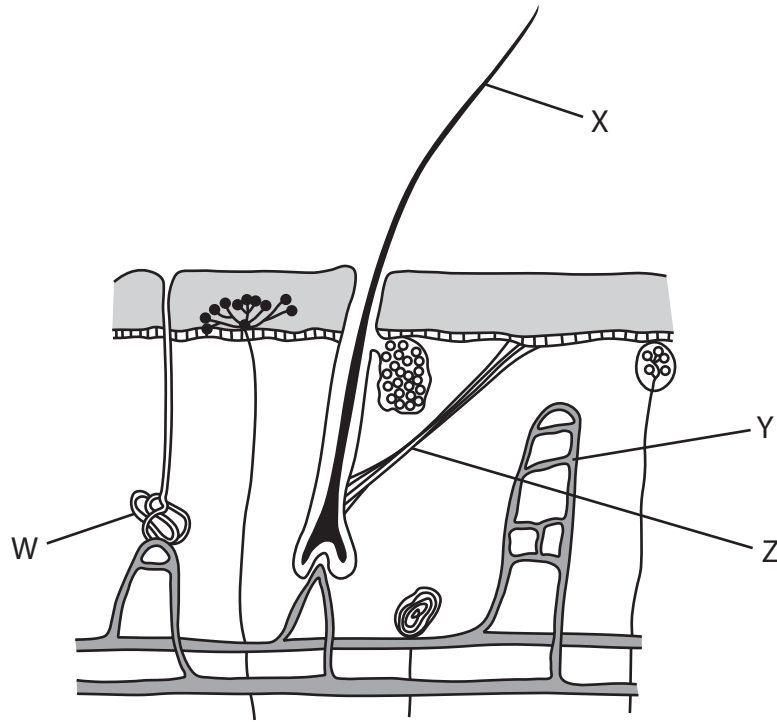


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6 The diagram shows a section through the skin.



(a) (i) Name structures W, X and Y.

(3)

W

X

Y

(ii) Describe the functions of W and Y in maintaining body temperature.

(6)

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(iii) The skin helps to maintain body temperature.

State two other functions of the skin.

(2)

1

2

(b) Describe the function of structure Z.

(2)

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(Total for Question 6 = 13 marks)

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7 (a) State the meaning of the term **pathogen**.

(2)

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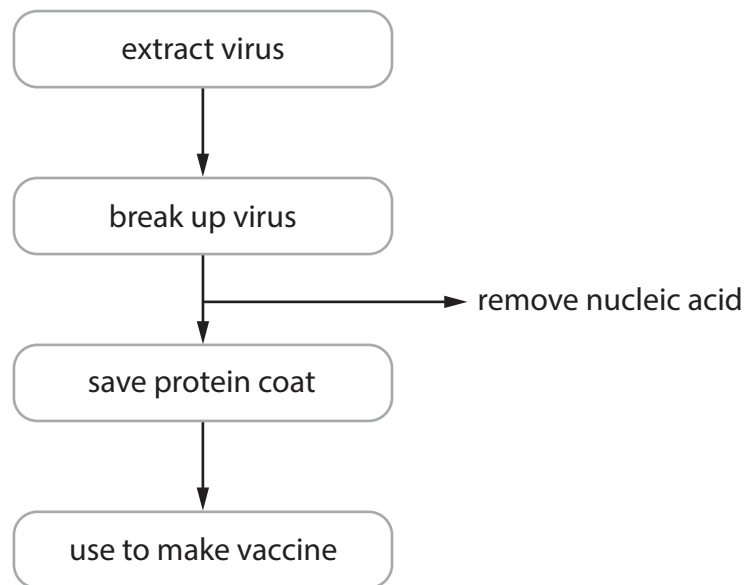
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(b) The diagram shows stages in the preparation of a vaccine.

The vaccine is used to protect the body against a viral disease.



(i) Give the type of immunity obtained by using this vaccine.

(2)

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(ii) Explain why the nucleic acid is removed.

(2)

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(c) Describe how vaccination gives a person immunity to a disease.

(5)

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(Total for Question 7 = 11 marks)

TOTAL FOR PAPER = 90 MARKS



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