

Please check the examination details below before entering your candidate information

Candidate surname					Other names				
Centre Number					Candidate Number				

Pearson Edexcel International Advanced Level

Monday 20 January 2025

Morning (Time: 1 hour 20 minutes)

Paper reference **WBI13/01**

Biology

International Advanced Subsidiary/Advanced Level

UNIT 3: Practical Skills in Biology I

You must have:
Scientific calculator, ruler, HB pencil

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.*

Information

- The total mark for this paper is 50.
- 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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Answer ALL questions.

Write your answers in the spaces provided.

- 1** Coir fibres are collected from coconuts.

The photograph shows part of a coconut with some of these fibres.



(Source: © Mohammed Anwarul Kabir Choudhury / Alamy Stock Photo)

- (a) Name **two** types of fibre cells found in a plant.

(2)

1

.....

2

.....



(b) A student investigated the effect of length on the tensile strength of these fibres.

(i) State what is meant by the term **tensile strength**.

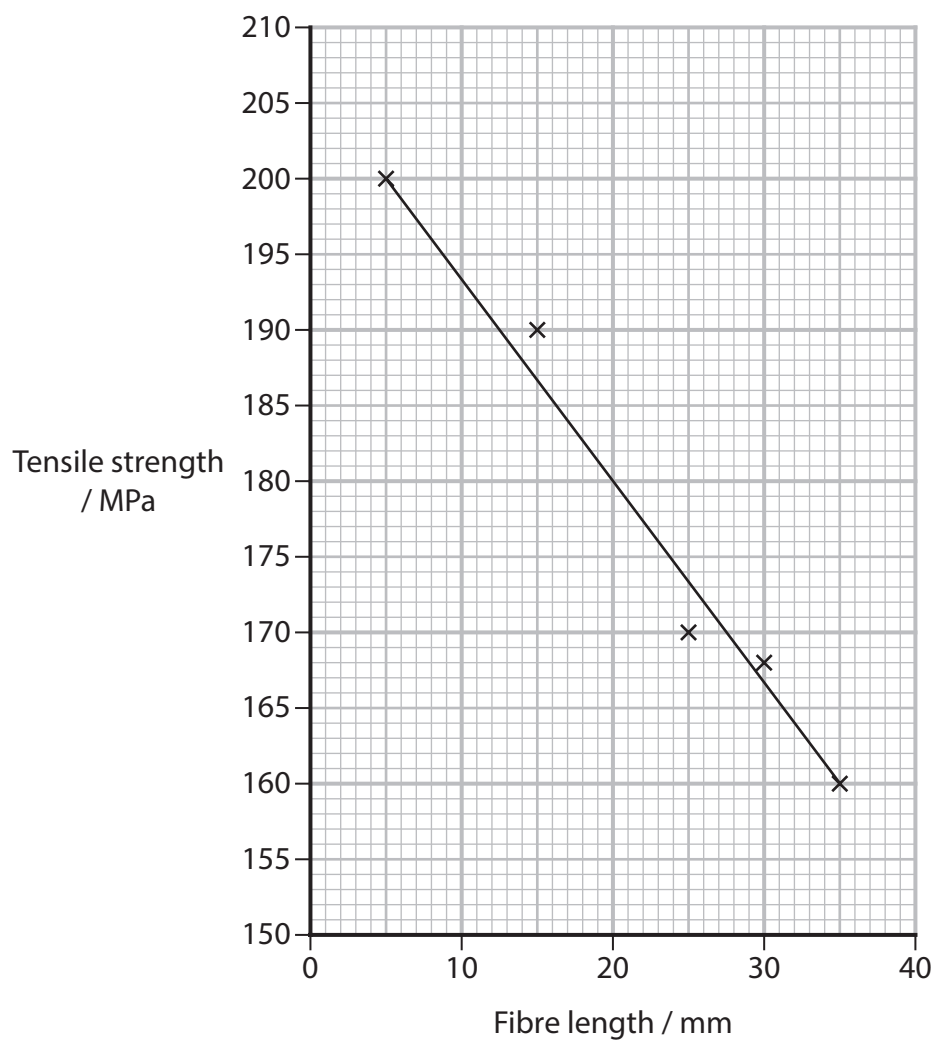
(1)

(ii) Describe how to investigate the relationship between the length of these fibres and their tensile strength.

(4)



(c) The graph shows the results of a similar investigation.



(i) Draw a table to show all the results shown in the graph.

(3)

(ii) Calculate the gradient of the line of best fit shown in this graph.

(1)

Answer

(iii) Write the equation for the line of best fit shown in this graph.
Use the graph and your answer to part (ii) to write this equation.

(2)

Equation for this line of best fit

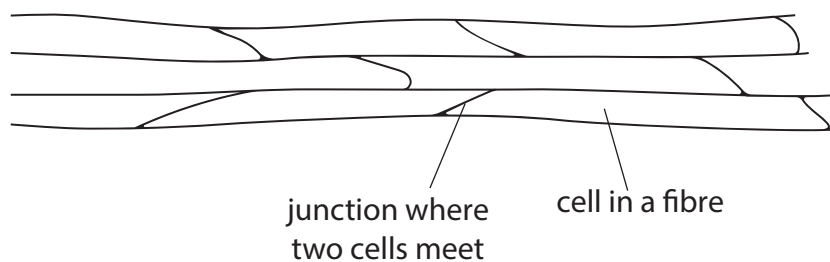
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(d) The drawing shows the structure of part of a plant fibre.



The table shows the gradients for similar graphs for three other types of fibre.

Fibre	Gradient
bamboo	-3.12
brown coir	-1.25
jute	-1.16

(i) State the relationship represented by the gradient.

(1)

- (ii) Suggest how differences in the structure of these three fibres could affect their tensile strength.

Use the information in the graph, the drawing and the table to support your answer.

(3)

(Total for Question 1 = 17 marks)

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- 2 Several factors are involved in the germination and growth of pollen tubes. These factors include temperature, pH and the presence of calcium ions.

(a) Describe the role of the pollen tube in plant reproduction.

(2)

- (b) A scientist investigated the effect of calcium chloride concentration on pollen tube growth.

The pollen tubes were $75\mu\text{m}$ long at the start of the investigation.

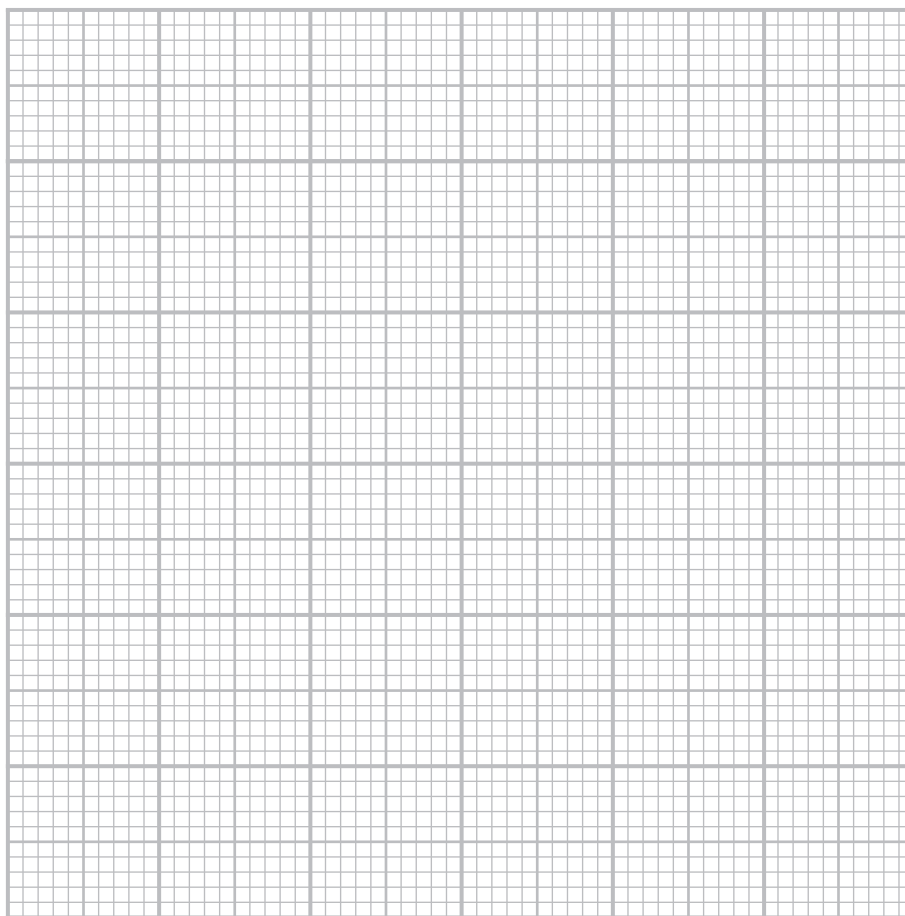
The table shows the results of this investigation.

Calcium chloride concentration / a.u.	Mean pollen tube length after 1 hour / μm
1	75
2	285
3	430
4	415
5	340
6	76



(i) Plot a graph to show all the data.

(4)



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(ii) Describe how the data in the table could be obtained.

(6)

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(iii) Comment on the results of this investigation.

(3)

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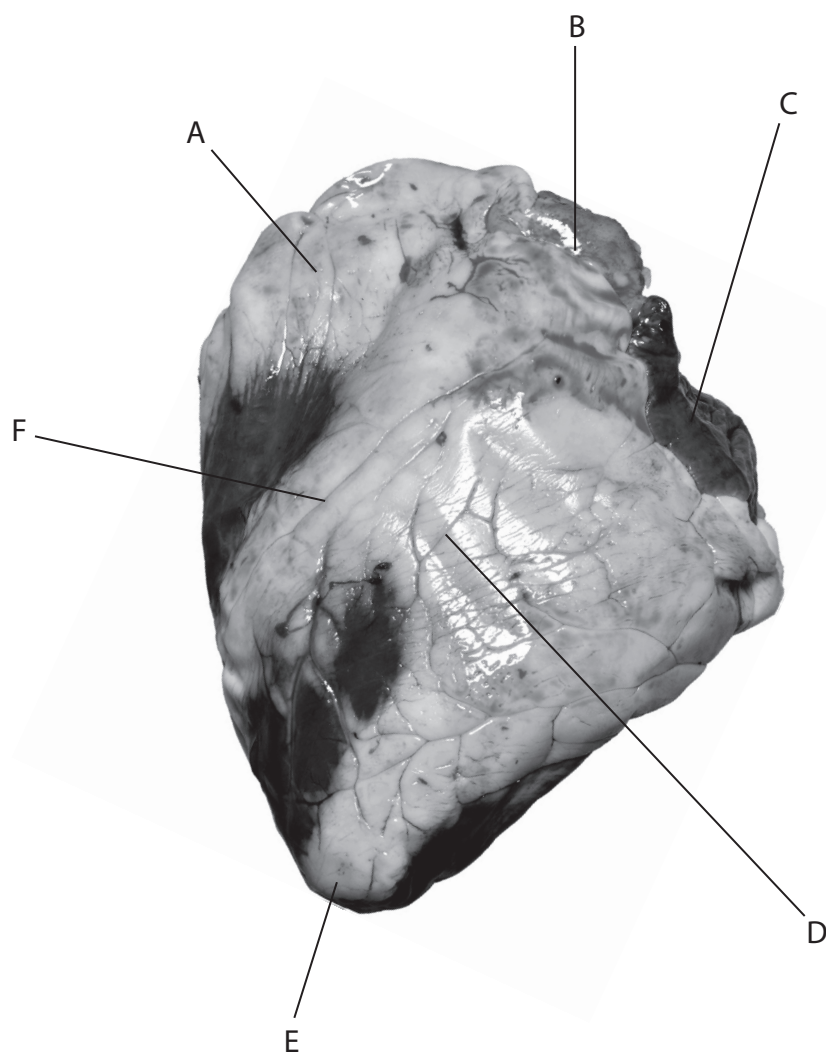
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(Total for Question 2 = 15 marks)



- 3 Photograph 1 shows the exterior of the front of the heart of a mammal. It has been positioned to begin a dissection.



(Source: © PjrStudio / Alamy Stock Photo)

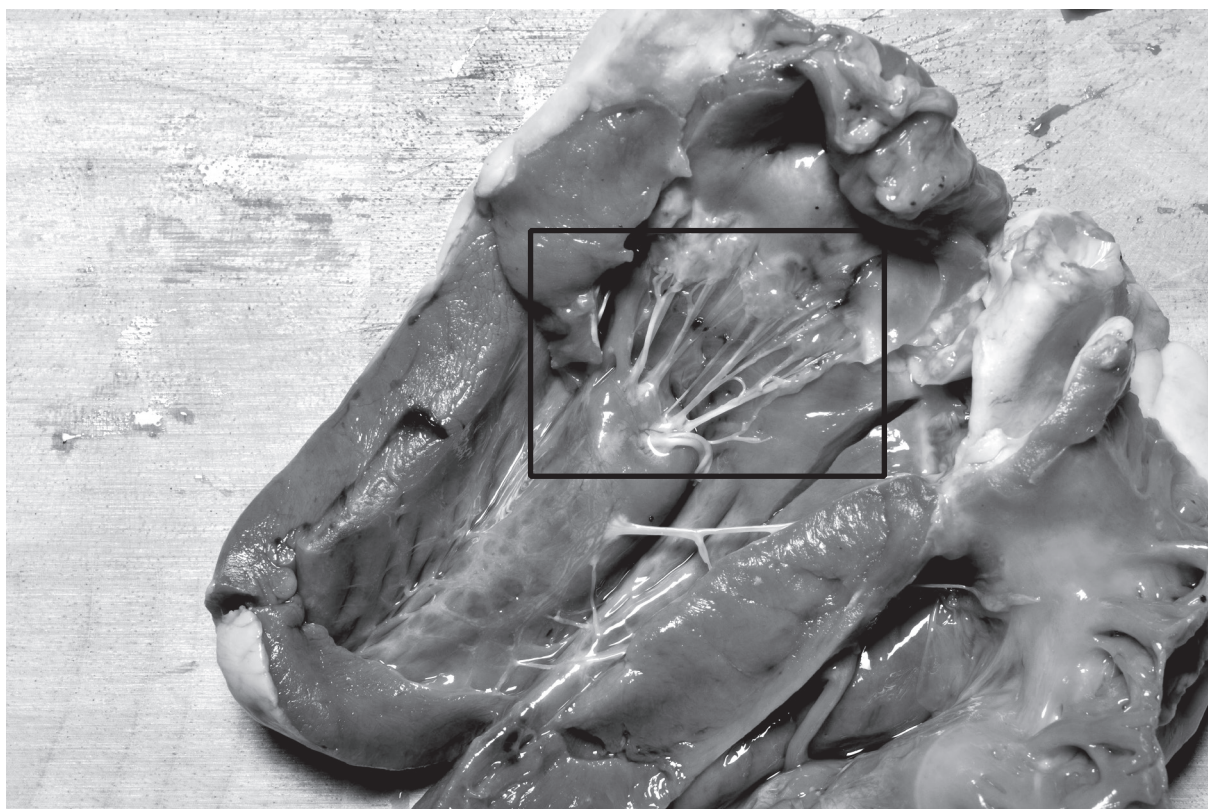
Photograph 1

- (a) (i) Complete the table with the letters of the locations of the four structures listed.

(4)

Structure	Label letter
Apex	
An atrium	
The place where the right and left ventricles meet	
Coronary blood vessels	

- (ii) Photograph 2 shows the inside of the left side of the heart after it was cut open.



(Source: © PjrStudio / Alamy Stock Photo)

Photograph 2

Draw a line on **photograph 1** to show where this cut was made.

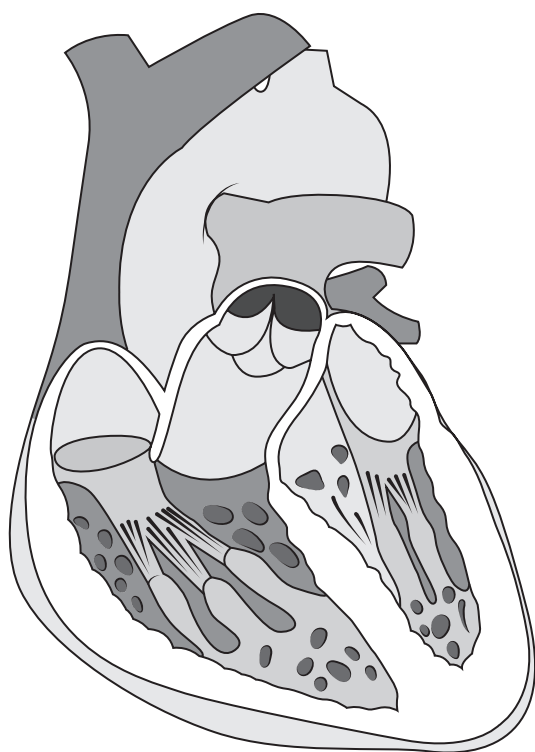
(1)

- (iii) Draw a plan of the structures within the rectangle on **photograph 2**.
Label the tendinous cords (heart strings) and the cut surface of the muscular wall of the ventricle.

(3)



- (b) The diagram shows a healthy heart and one showing a heart condition called dilated cardiomyopathy (DCM).



Healthy heart



Heart with DCM

Compare and contrast the structures of these two hearts.

(4)

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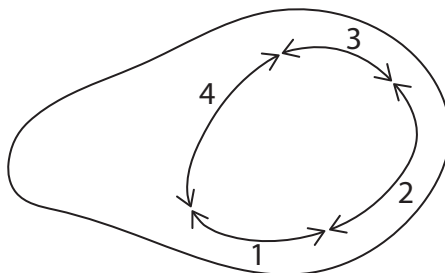
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Handwriting practice lines consisting of 15 horizontal dotted lines.



- (c) A post-mortem study was made on 68 hearts. Of these, 48 were hearts with DCM and 20 were healthy hearts.

The diagram shows the measurements, labelled 1 to 4, that were made from sections of the left ventricles of hearts with DCM and those of healthy hearts.



- (i) State the independent variable in this study.

(1)

- (ii) When added together, these measurements give the full ventricular circumference.

The data is shown in the table.

Type of heart	Mean measurement / cm				
	1	2	3	4	Total
Healthy	1.88	3.20	3.26	4.92	13.26
With DCM	3.81	5.10	5.15	6.30	20.36

Calculate the percentage increase in the left ventricular circumference shown to be caused by DCM.

Give your answer to **three** significant figures.

(2)

Answer



- (iii) The mean circumference of hearts with DCM is larger than the mean circumference of healthy hearts.

Discuss the relative effects of the changes in the four individual measurements on the overall increase in circumference.

(3)

(Total for Question 3 = 18 marks)

TOTAL FOR PAPER = 50 MARKS

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