Pearson Edexcel

International GCSE

Biology (9–1) (Modular)

Sample Assessment Materials

Pearson Edexcel International GCSE in Biology (Modular) (4XBI1)

First teaching September 2024
First examination June 2025
First certification August 2025

Issue 1

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Introduction

The Pearson Edexcel International GCSE (9-1) in Biology (Modular) (4XBI1) is designed for use in schools and colleges. It is part of a suite of International GCSE modular qualifications offered by Pearson.

These sample assessment materials have been developed to support this qualification and will be used as the benchmark to develop the assessment students will take.

The sample assessment materials in this document are derived from the existing Edexcel International GCSE (9-1) in Biology qualification, which is linear in design.

Both linear and modular routes are designed to provide the same level of demand overall while offering candidates a choice of assessment options. In the modular qualification, candidates are able to sit and resit individual units in different series.

Note: Within International GCSE (9-1) in Biology (Modular), assessments are referred to as units. This is to support the modular nature of the qualification as each individual assessment is entered for as a separate unit.

General marking guidance

- All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than be penalised for omissions.
- Examiners should mark according to the mark scheme – not according to their perception of where the grade boundaries may lie.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification/indicative content will not be exhaustive. However, different examples of responses will be provided at standardisation.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, a senior examiner must be consulted before a mark is given.
- Crossed-out work should be marked **unless** the candidate has replaced it with an alternative response.

Subject specific marking guidance

Symbols and terms used in the mark scheme:

- Round brackets ( ): words inside round brackets are to aid understanding of the marking point but are not required to award the point
- Curly brackets { }: indicate the beginning and end of a list of alternatives (separated by obliques) where necessary, to avoid confusion
- Oblique /: words or phrases separated by an oblique are alternatives to each other and either answer should receive full credit
- ecf: indicates error carried forward which means that a wrong answer given in an early part of a question is used correctly in a later part of a question.

You will not see 'owtte' (or words to that effect). Alternative correct wording should be credited in every answer unless the mark scheme has specified otherwise.

The Additional Guidance column is used for extra guidance to clarify any points in the mark scheme. It may be used to indicate:

- what will not be accepted for that marking point, in which case the phrase 'do not accept' will appear alongside the relevant marking point
- it might have examples of possible acceptable answers which will be adjacent to that marking point.

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)

Sample assessment material for first teaching 2024

Time 1 hour 40 minutes

Paper reference **4WBI1/1B**

Biology (Modular)
UNIT 1

You must have:
Ruler, 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.*

Information

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

Turn over ▶

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S 8 1 5 4 3 A 0 1 2 4

Pearson

Answer ALL questions.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 Biologists classify organisms into different groups. One group of organisms is fungi.

Complete the passage about fungi by writing a suitable word or words in each blank space.

(4)

Fungi do not carry out photosynthesis. Their body is usually organised into a mycelium made from thread-like structures called ..... .

Fungal cell walls are made of .....

Fungi feed by extracellular secretion of ..... onto food material and absorption of the organic products. This is known as ..... nutrition.

(Total for Question 1 = 4 marks)

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2 (a) All living organisms share characteristics.

(i) State **two** characteristics that all living organisms share.

(2)

1 .....

.....

2 .....

.....

(ii) Some organisms are pathogens.

Which of these organisms can cause a bacterial disease in humans?

(1)

☒ **A** *Amoeba*

☒ **B** *Lactobacillus bulgaricus*

☒ **C** *Mucor*

☒ **D** *Pneumococcus*

(b) Give **three** differences between the structure of viruses and bacteria.

(3)

1 .....

.....

2 .....

.....

3 .....

.....

(Total for Question 2 = 6 marks)

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3 A meal contains different food components.

(a) The table lists some of the components in the meal.

Complete the table by giving the function of each component.

One has been done for you.

(4)

Component	Function of component
vitamin A	
vitamin C	
vitamin D	bone growth
iron	
dietary fibre	

(b) The meal also contains proteins and lipids.

The chemical elements found in proteins are carbon, hydrogen, oxygen and nitrogen.

State which **one** of these elements is not found in lipids.

(1)

.....

(Total for Question 3 = 5 marks)

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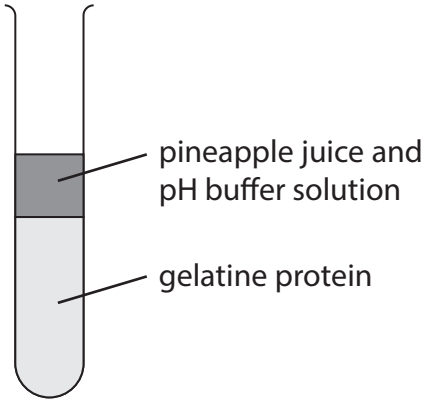
4 Pineapple juice contains a protease called bromelain.

A student uses this method to investigate the digestion of solid gelatine protein by bromelain.

- place solid gelatine protein into a test tube up to a height of 5 cm
- mix 5 cm^3 pineapple juice with 1 cm^3 of pH 4 buffer
- place 1 cm^3 of the pineapple juice and buffer solution on top of the gelatine
- leave for one hour in a water bath set to 37 °C
- measure the height of the solid gelatine and use it to calculate the volume of gelatine that has been digested.

Repeat the method three more times.

The diagram shows part of the student's method.



(a) The table shows the student's results for the volumes of gelatine digested at pH 4.

Tube number	Volume of gelatine digested in cm^3
1	0.55
2	1.89
3	0.54
4	0.16

(i) Calculate the mean volume of gelatine digested in cm^3.

Give your answer to **two** decimal places.

(3)

mean volume = ... cm^3

(ii) State what substances are produced when the gelatine protein is digested.

(1)

.....

(b) The student repeats the investigation with different pH buffers.

The table shows their results.

pH	Mean volume of gelatine digested in cm^3
3	0.32
5	0.98
7	0.51
9	0.33
11	0.01

(i) Give **two** variables the student should control.

(2)

1 .....

2 .....

(ii) Explain the effect of changing the pH on the mean volume of gelatine digested.

(3)

(Total for Question 4 = 9 marks)

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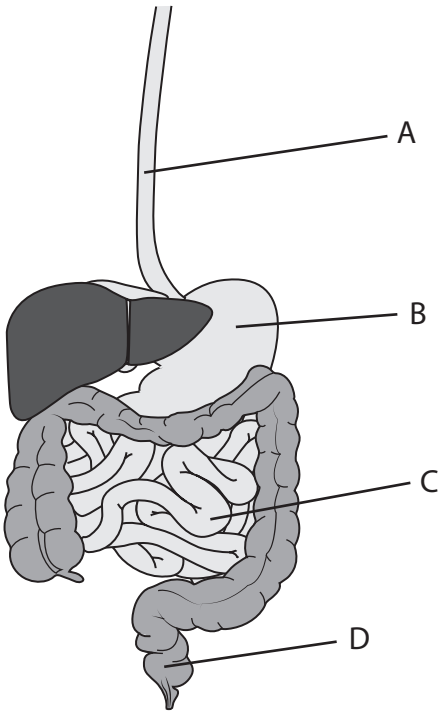
5 (a) The diagram shows part of the human digestive system.



(i) In which of these parts is hydrochloric acid produced?

(1)

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

(ii) In which of these parts are faeces stored?

(1)

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

(iii) Which of these parts is the small intestine?

(1)

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

(b) The liver produces bile.

Explain the role of bile in digestion.

(3)

(Total for Question 5 = 6 marks)

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6 Plants use their leaves during photosynthesis.

(a) Explain how the structure of a leaf is adapted for gas exchange.

(4)

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(b) A student observes that the leaves on different ivy plants seem to be different sizes depending on the amount of sunlight the plants receive.

Design an investigation to test whether the amount of sunlight received by ivy plants affects the size of their leaves.

Include experimental details in your answer and write in full sentences.

(6)

(Total for Question 6 = 10 marks)

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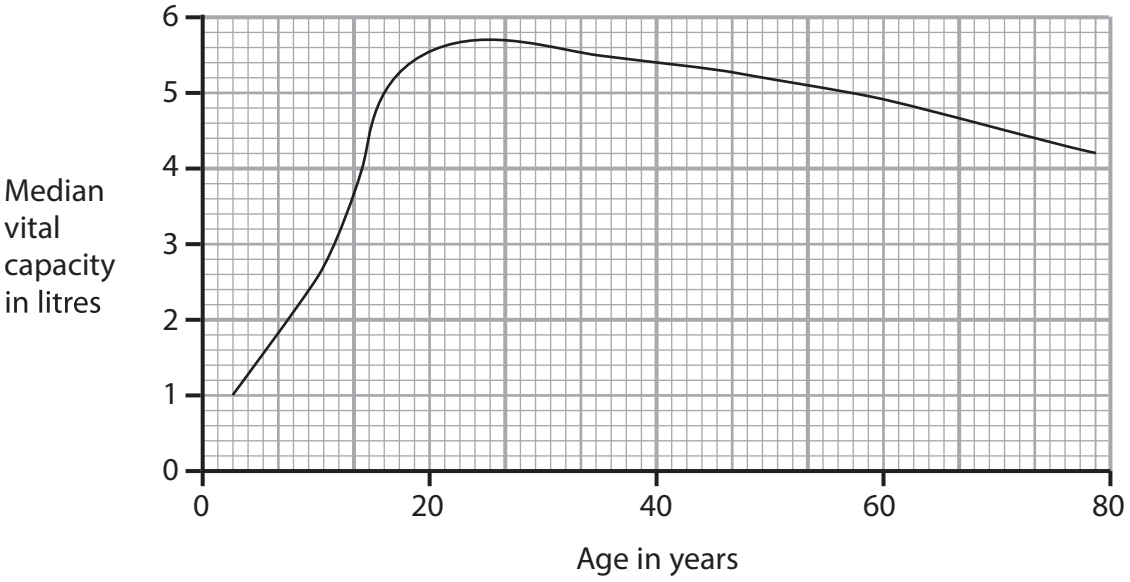
7 (a) Vital capacity is the maximum volume of air that a person can force out of their lungs in one breath.

The graph shows the relationship between vital capacity and age for a large number of people.



The vital capacity plotted is the median value for each age.

(i) Determine the percentage change in median vital capacity from age 20 to age 80.

(2)

percentage change = ... %

(ii) Explain why the median is used rather than the mean.

(2)

.....

.....

.....

.....

.....

.....

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(iii) Explain why vital capacity changes with age.

(2)

(iv) Age is not the only variable that can change vital capacity.

Give **two** other variables that can affect a person's vital capacity.

(2)

1 .....

.....

2 .....

.....

(b) Describe a method you could use to demonstrate the effect of exercise on breathing rate in students.

(3)

(Total for Question 7 = 11 marks)

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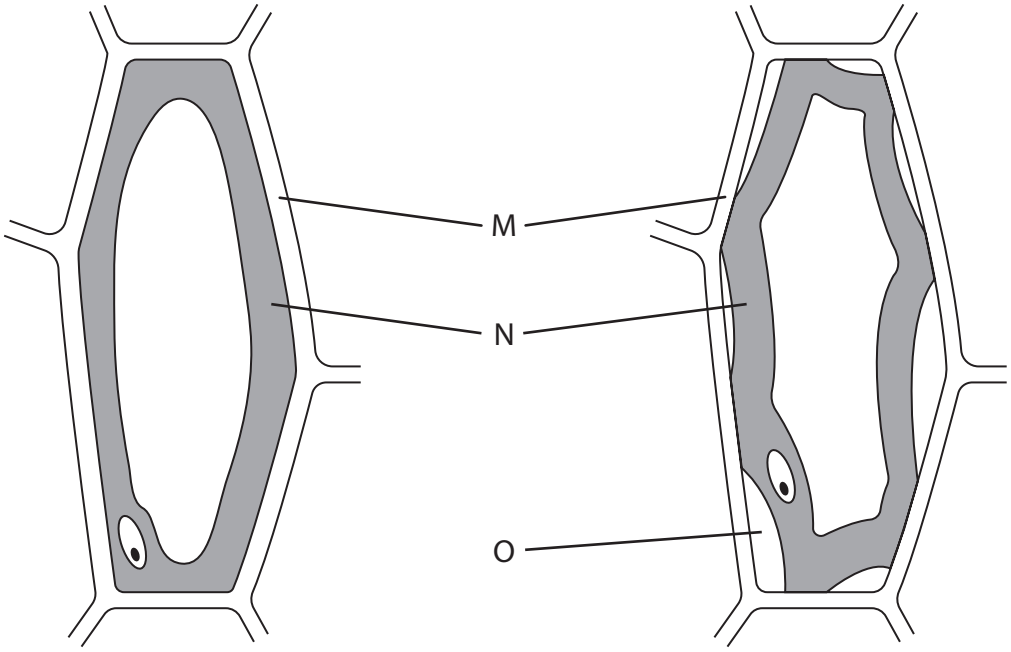
8 The diagram shows a plant cell in distilled water and a plant cell in a concentrated solution of sodium chloride.



Cell in distilled water

Cell in concentrated solution of sodium chloride

(a) (i) Which structure is labelled M?

(1)

- ☒ **A** cell membrane
- ☒ **B** cell wall
- ☒ **C** nucleus
- ☒ **D** vacuole

(ii) Which structure is labelled N?

(1)

- ☒ **A** cell membrane
- ☒ **B** cell wall
- ☒ **C** cytoplasm
- ☒ **D** vacuole

(b) (i) Give the name of the liquid found in the gap labelled O in the cell in the concentrated solution of sodium chloride.

(1)

(ii) Explain the differences in the appearance of the cell in distilled water and the cell in the concentrated solution of sodium chloride.

(4)

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(c) Describe an experiment you could do to show how different concentrations of sodium chloride solution affect the appearance of plant cells.

(4)

(Total for Question 8 = 11 marks)

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9 An electronic cigarette (e-cigarette) has been developed.

Instead of burning tobacco, e-cigarettes heat a liquid that contains nicotine and flavourings to produce a vapour that is inhaled.

Scientists carried out an investigation to see how the smoking habits of people changed between 2011 and 2016.

Each year they determined the percentage of people who used e-cigarettes and the percentage of people who smoked normal cigarettes during the year.

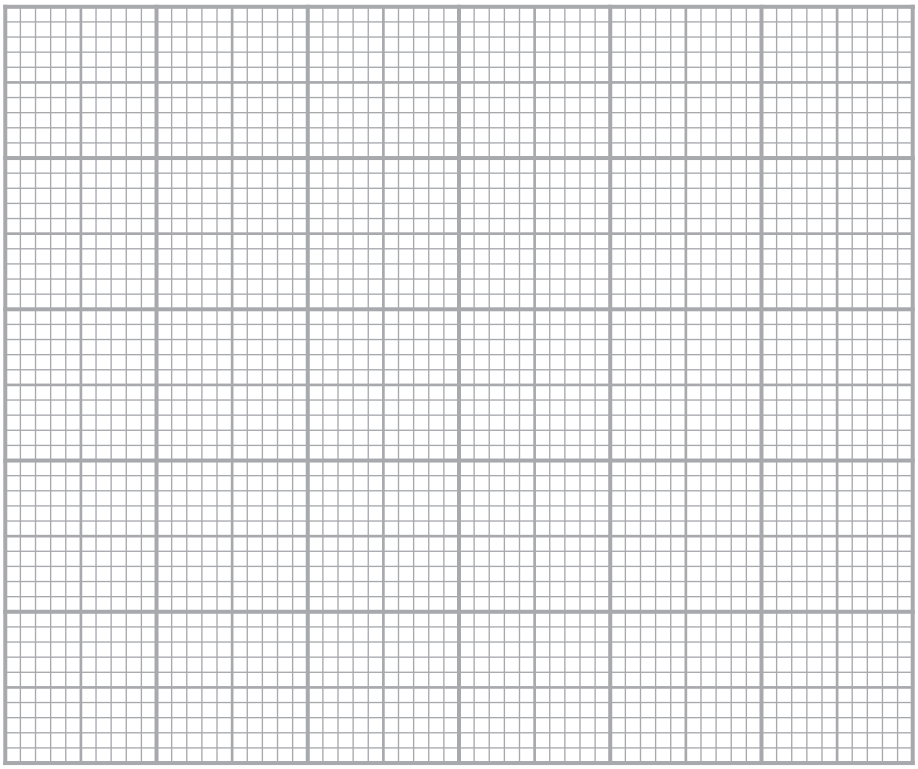
The results are shown in the table.

	Percentage of people	
Year	**using e-cigarettes**	**smoking normal cigarettes**
2011	1.5	15.8
2012	2.8	14.0
2013	4.5	12.7
2014	13.4	9.5
2015	16.0	9.3
2016	11.3	8.0

(a) Plot a line graph to show how the percentage of people who used ecigarettes and the percentage of people who smoked normal cigarettes changed between 2011 and 2016.

Join the points with straight lines.

(6)



(b) Describe the changes in the percentages of people smoking cigarettes and using e-cigarettes between 2011 and 2016.

(2)

.....

.....

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(c) The scientists interviewed 60 000 people each year during the period of the investigation.

Calculate the change in the number of people who were smoking normal cigarettes from 2011 to 2016.

(2)

number of people = ...

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(d) Some people consider e-cigarettes as a less harmful alternative to smoking normal cigarettes.

(i) Explain why using ecigarettes may be thought to be less harmful than smoking normal cigarettes.

(4)

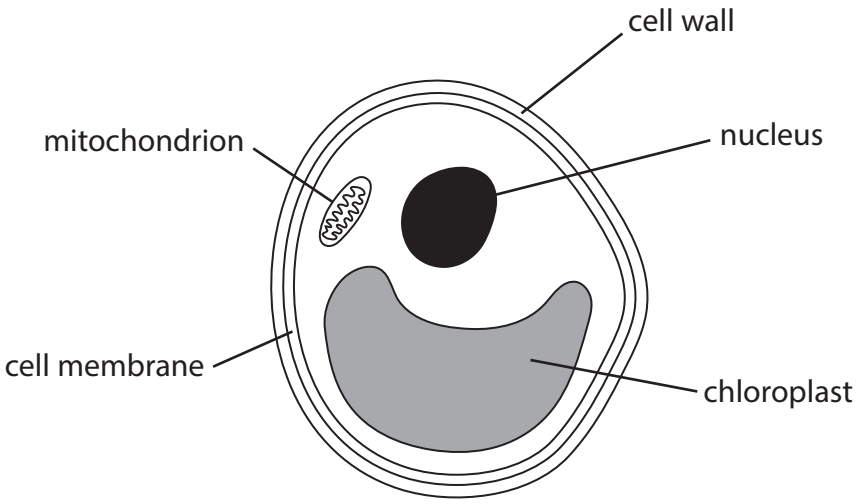
(ii) Suggest why many doctors are concerned about the use of e-cigarettes.

(2)

(Total for Question 9 = 16 marks)

10 The diagram shows a single-celled organism called *Chlorella* that lives in fresh water.

Chlorella has a chloroplast and can photosynthesise.



(a) (i) Which of these groups of organisms contains *Chlorella*?

(1)

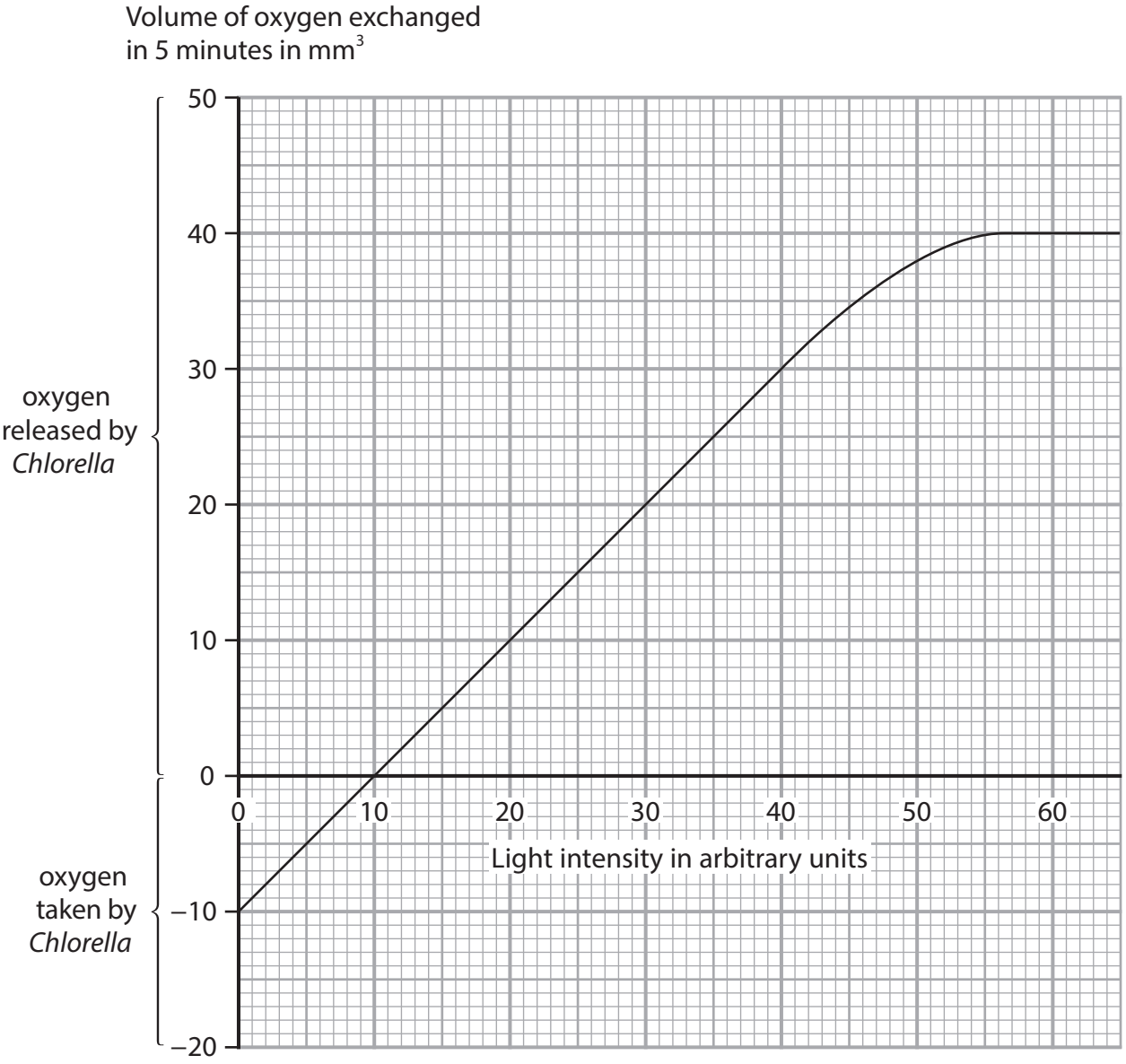
- ☒ **A** animals
- ☒ **B** bacteria
- ☒ **C** plants
- ☒ **D** protoctists

(ii) Which of these labelled structures would also be present in an animal cell?

(1)

- ☒ **A** cell membrane and chloroplast
- ☒ **B** cell membrane and mitochondrion
- ☒ **C** cell wall and chloroplast
- ☒ **D** cell wall and mitochondrion

(b) The graph shows the effect of light intensity on gas exchange by *Chlorella*.



(i) Explain why *Chlorella* takes in oxygen at light intensities below 10 arbitrary units.

(2)

.....

.....

.....

.....

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(ii) Explain the changes in the volume of oxygen released as the light intensity increases from 10 arbitrary units.

(3)

(iii) The volume of oxygen released by *Chlorella* is the difference between the oxygen produced by photosynthesis and the oxygen taken in.

Use the graph to calculate the volume of oxygen produced in five minutes by photosynthesis at a light intensity of 50 arbitrary units.

(2)

volume of oxygen = ... mm^3

(c) Describe how hydrogen-carbonate indicator could be used to investigate the effect of light intensity on carbon dioxide exchange by *Chlorella*.

(3)

(Total for Question 10 = 12 marks)

TOTAL FOR UNIT = 90 MARKS

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