Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Level 3 GCE

Monday 13 May 2024

Morning (Time: 1 hour 30 minutes)

Paper reference **8BI0/01**

Biology B

Advanced Subsidiary

PAPER 1: Core Cellular Biology and Microbiology

You must have:
Scientific calculator, HB pencil, ruler

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 80.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- In question(s) marked with an **asterisk** (*), marks will be awarded for your ability to structure your answer logically, showing how the points that you make are related or follow on from each other where appropriate.

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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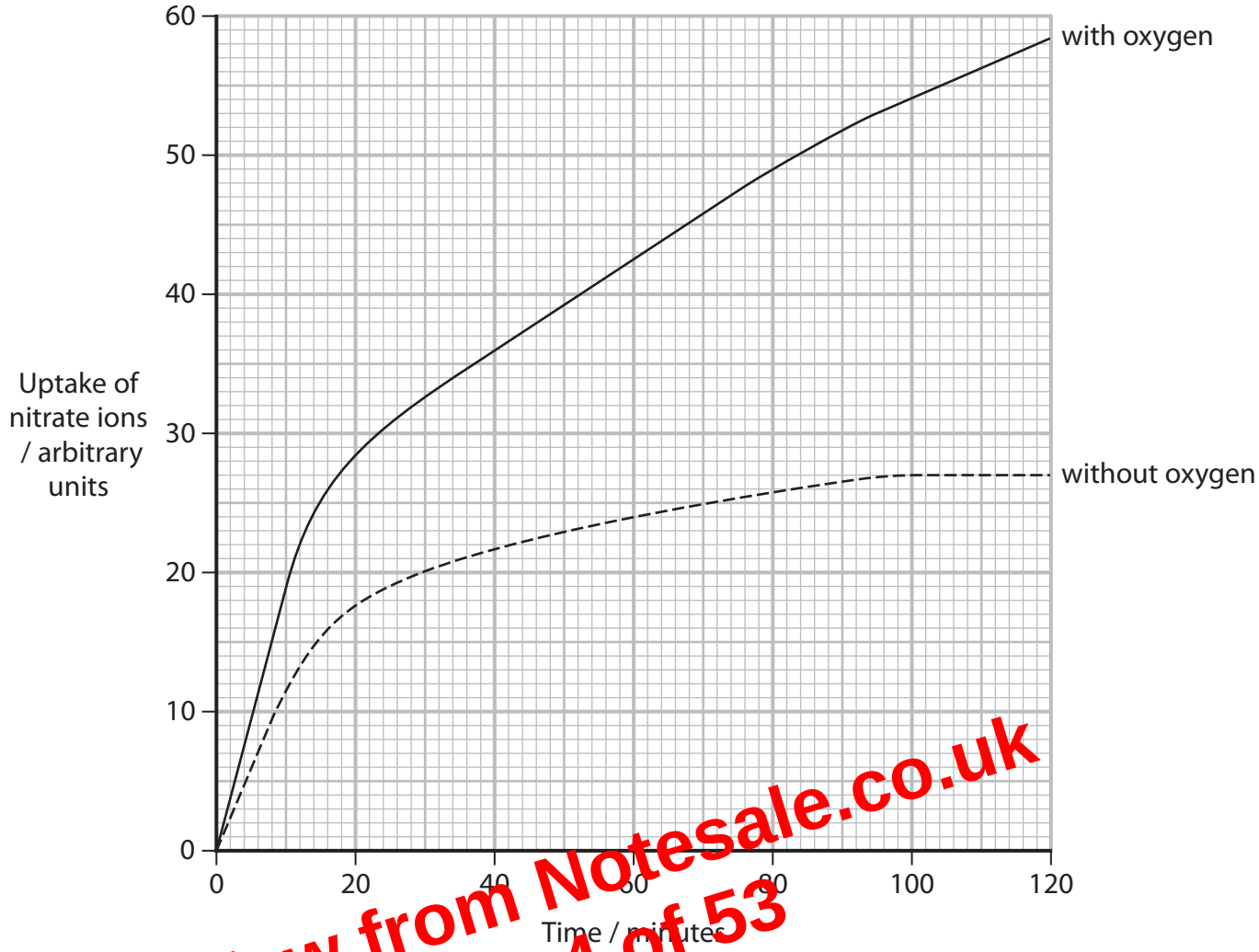
P 7 4 4 7 4 A 0 1 2 8

Pearson

(b) The graph shows the uptake of nitrate ions by a plant in the presence and absence of oxygen.



Analyse the data to describe two conclusions that can be made about the uptake of nitrate ions by this plant.

(2)

1 .....

.....

.....

2 .....

.....

.....

(Total for Question 1 = 5 marks)

(c) The actual length of this mitochondrion is 0.9 µm.

(i) What is the magnification of this photograph?

(1)

- ☒ **A** ×1200
- ☒ **B** ×8200
- ☒ **C** ×12 000
- ☒ **D** ×82 000

(ii) The magnification of this photograph can be shown as a scale bar.

Complete the 1 cm scale bar for this photograph.

(1)

1 cm scale bar ⟷

Answer ..... µm

(d) Explain why specimens have to be stained with coloured dyes when viewed using a light microscope and not when using an electron microscope.

(2)

(Total for Question 5 = 8 marks)

8 Carbohydrates can be classified as monosaccharides, disaccharides, or polysaccharides.

(a) The table gives some information about polysaccharides.

For each polysaccharide, put **one** cross in the appropriate box, in each row, to show the type of glycosidic bond present.

(3)

Polysaccharide	Type of glycosidic bond			
	both 1–4 and 1–6	**1–4 only**	**1–6 only**	**neither 1–4 nor 1–6**
cellulose	☒	☒	☒	☒
glycogen	☒	☒	☒	☒
starch	☒	☒	☒	☒

(b) Monosaccharides and disaccharides are either reducing sugars or non-reducing sugars.

The presence of a reducing sugar, such as glucose, can be identified using the Benedict's test. The method can be used to determine the concentration of the reducing sugar.

The diagram shows the steps involved in the Benedict's test.

Step 1

Add Benedict's solution to the sugar solution in a test tube

↓

Step 2

Place the test tube in a hot water bath until the colour changes

↓

Step 3

Determine the concentration of reducing sugar from a colour chart

Question Number	Answer	Additional Guidance	Mark
1(a)(i)	**The only correct answer is** C **A** is incorrect because magnesium ions are not incorporated into amino acids or nucleotides **B** is incorrect because magnesium ions are not incorporated into amino acids **D** is incorrect because magnesium ions are not incorporated into nucleotides		(1)

Question Number	Answer	Additional Guidance	Mark
1(a)(ii)	An explanation that makes reference to the following: • because water is {(di)polar } (solvent) (1) • ions form charged attractions / electrostatic attractions (with it) (1)	**ACCEPT** charged / hydrophilic **ACCEPT** form hydrogen bonds	(2)

Question Number	Answer	Additional Guidance	Mark
3(a)(i)	**The only correct answer is A** **B** is incorrect because bacteria have 70S ribosomes **C** is incorrect because bacteria do not have a nucleus **D** is incorrect because bacteria do not have a nucleus or 80S ribosomes		(1)

Question Number	Answer	Additional Guidance	Mark
3(a)(ii)	An answer that makes reference to the following: • cytoplasm • plasmids • cell membrane	3 correct = 2 marks 1 or 2 correct = 1 mark **ACCEPT** glycogen granules / lipid droplets /mesosome	(2)

Question Number	Answer	Additional Guidance	Mark
6(b)	A description that makes reference to two of the following: • globular / 3D / tertiary protein (1) • held together by {hydrogen bonds / disulfide bridges / ionic bonds/hydrophobic (interactions)} (1) • between R groups (1) • has an active site (1)	**Accept** hydrophobic R groups on inside /hydrophilic R groups on outside = mp 2 & 3	(3) EXP

Question Number	Answer	Additional Guidance	Mark
9(b)(ii)	An answer that makes reference to three of the following: **Similarities (max 2)** • all contain all four types of phospholipid (1) • A is the commonest in all four types of membrane (1) • B has the second highest percentage in all four types (1) **Differences (max 2)** • each membrane has a different { ratio/ percentage } of the four types of phospholipid (1) • C has the lowest percentage in the cell membrane and D has the lowest percentage in the other types of membrane (1) • the relative proportions of B, C and D are different in the cell membrane compared with the other three types of membrane (1)	**Accept** D is lowest in all except the cell membrane **Accept** description of the order of the types	(3)