Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel International Advanced Level

Friday 16 January 2026

Afternoon (Time: 1 hour 20 minutes)

Paper reference **WBI16/01**

Biology

International Advanced Level
UNIT 6: Practical Skills in Biology II

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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Pearson

Answer ALL questions.

1 The photograph shows marram grass growing on a sand dune in Australia.

Marram grass plant
0.5 metres wide

(Source: © Sarah Richardson/ Alamy Stock Photo)

Marram grass can tolerate wind and salt in the air.

A student decided to investigate the distribution of marram grass from the sea to 200 m inland.

(a) Identify **one** risk that the student might encounter and describe how this risk could be reduced.

(2)

Risk

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Reduction of risk

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(b) Describe an investigation to show the change in the distribution and abundance of these plants from the sea to 200 m inland.

(5)

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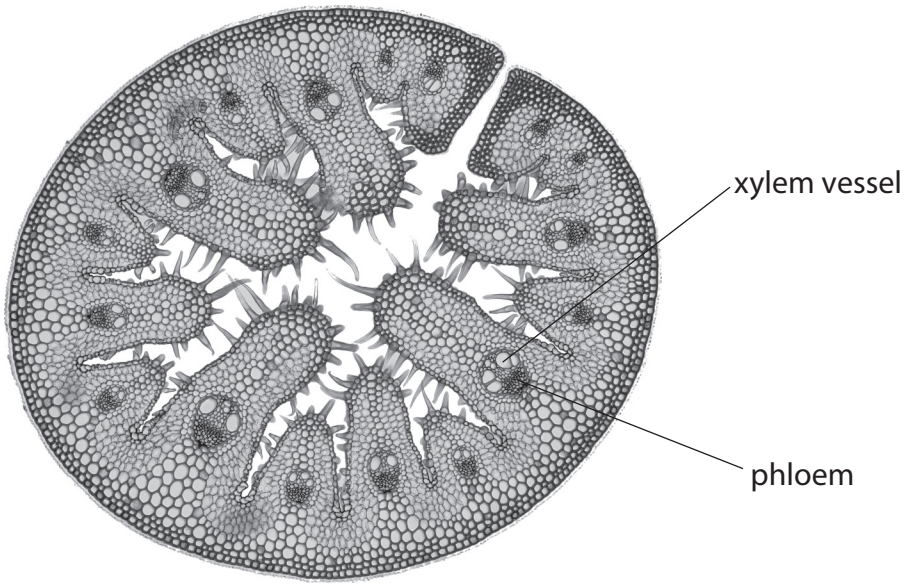
(c) The photograph shows a cross-section of a marram grass leaf.



(Source: © GERD GUENTHER / SCIENCE PHOTO LIBRARY)

Describe the differences in the structures and functions of xylem vessels and phloem.

(4)

(Total for Question 1 = 11 marks)

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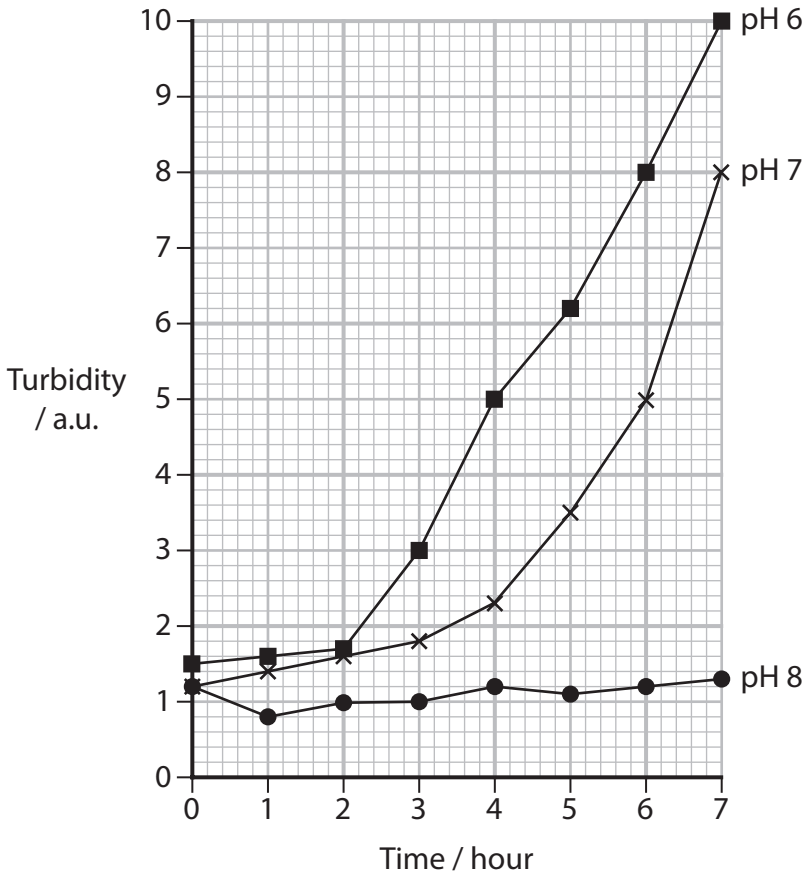
2 Yeast are single-celled microorganisms that can be grown in liquid culture.

Turbidity (an optical method) can be used to study the growth of yeast in a liquid culture.

A student investigated the effect of pH on the growth of yeast.

The graph shows the results of this investigation.



(a) Calculate the mean rate of change in turbidity of the yeast culture grown at pH 7 from 3 to 7 hours.

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

(2)

Answer ..... a.u. hour^{-1}

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(b) Some variables were measured in this investigation.

(i) State **two** abiotic variables that could affect this investigation.

(2)

First variable

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Second variable

.....

(ii) State how to control one of the variables you have identified in (i).

(1)

Variable

.....

Method of control

.....

.....

.....

(c) Describe a method the student could use to collect the data shown in the graph.

(5)

(Total for Question 2 = 10 marks)

3 There are many species of dung beetles in southern Africa.

These beetles collect elephant dung for food and to lay eggs inside it.

The photograph shows two beetles rolling a ball of elephant dung.

(Source: © PAUL MARSHALL / Alamy Stock Photo)

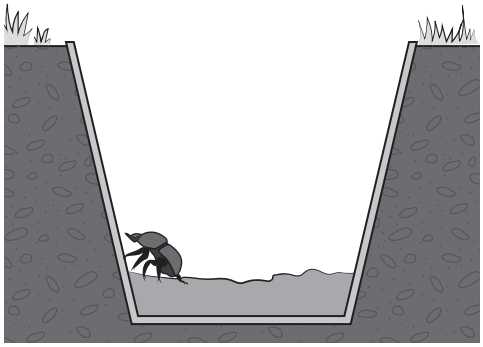
Magnification × 1

A student observed that several species of dung beetles moved the balls into grass-covered areas.

The student investigated the effect of percentage grass cover on the number of different species of dung beetle present in an area.

Ten pitfall traps were placed at equal distances in soil with 20% grass cover and 40% grass cover.

The diagram shows one of the pitfall traps used in this investigation.



Ten pitfall traps were placed in the soil in each of the two sites.

After five days, the number of different species found in each trap was recorded.

The results:

Site A 20% grass cover

number of species: 18 20 14 12 15 13 19 20 17 14

Site B 40% grass cover

number of species: 12 10 8 12 11 11 9 19 13 10

(a) State a suitable null hypothesis for this investigation.

(1)

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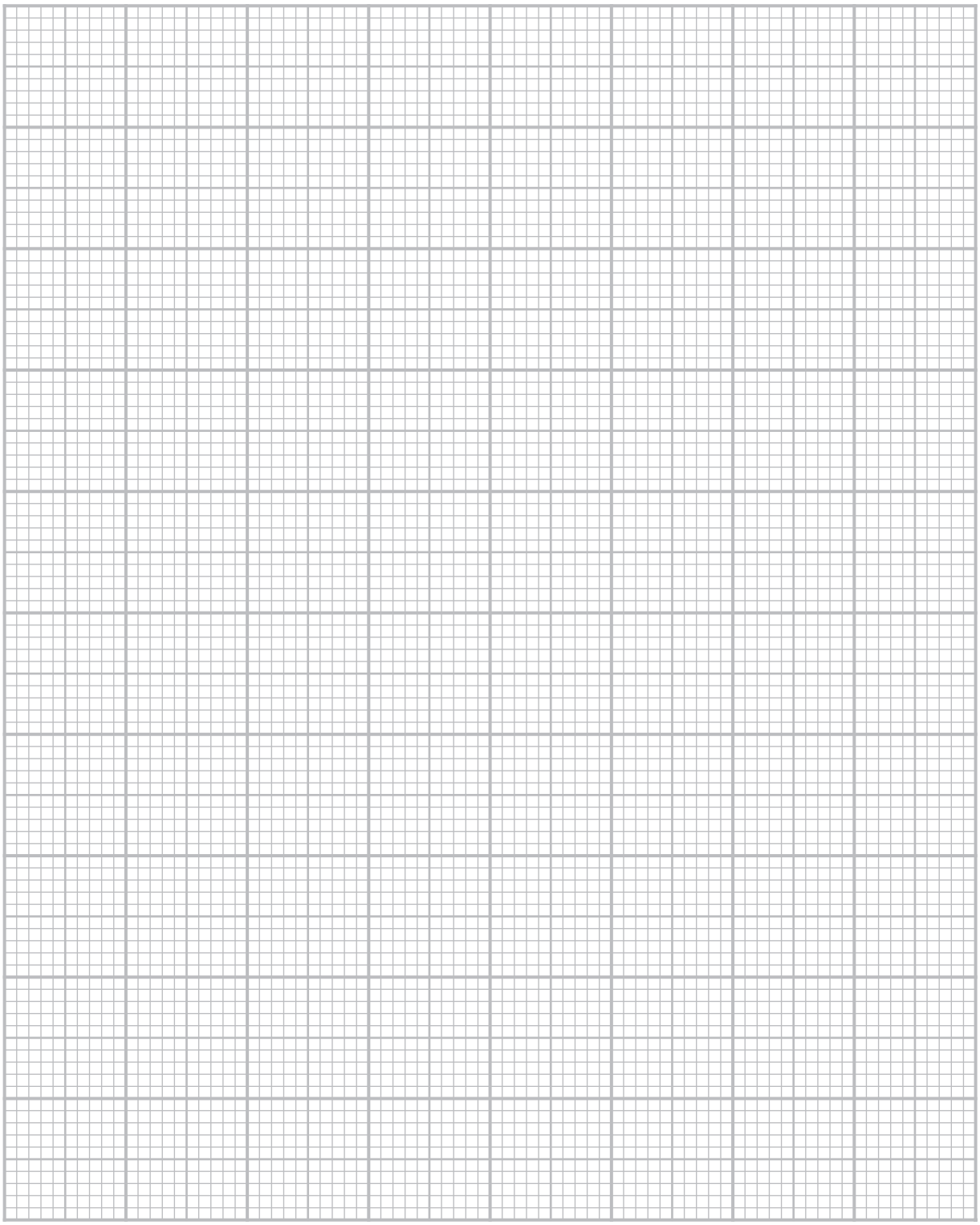
(b) Draw a suitable table to display the **data** and your calculated **means**.

(3)

(c) Draw a suitable graph to show the **mean** number of species and the percentage grass cover.

Include an indication of the **variability** of the data.

(3)



(d) The student decided to analyse the data with a *t* test using the formula

$$t = \frac{\left(\bar{x}_A - \bar{x}_B\right)}{\sqrt{\frac{(S_A)^2}{n_A} + \frac{(S_B)^2}{n_B}}}$$

where:

$\bar{x}$ is the mean value for each site

n is the number of samples for each site

$(S_A)^2 = 8.84$ and $(S_B)^2 = 9.17$

(i) Calculate the value of *t*.

(2)

Answer .....

(ii) The table shows the critical values of *t* for different degrees of freedom.

The number of degrees of freedom = $(n_A - 1) + (n_B - 1)$

Degrees of freedom	p = 0.05	p = 0.01
10	2.23	3.17
11	2.20	3.11
12	2.18	3.06
14	2.15	2.98
16	2.12	2.92
18	2.10	2.88
20	2.09	2.85

Describe the conclusion that can be drawn from this investigation.

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

(3)

(e) Describe how the student could extend this investigation to collect more data to either support or reject the hypothesis.

(2)

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(Total for Question 3 = 14 marks)

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4 Drumstick trees are native to northern India.

The photograph shows a seedling of one variety of these trees.

(Source: ©maximimages.com / Alamy Stock Photo)

These plants are a source of food for people.

To study the rate of growth of these plants, seeds are planted in pots in a greenhouse.

The temperature of the greenhouse can be controlled with a variation of 2 °C from 20 °C to 35 °C.

A student formed the following hypothesis:

The greater the temperature, the faster the rate of shoot growth.

Plan an investigation to find evidence to support or reject this hypothesis.

Your answer should give details under the following headings.

(a) Suggest why the student considered there are no ethical concerns to consider before practical work can begin.

(1)

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(b) Devise a detailed method, including how you would control and monitor important variables to provide quantitative results.

(9)

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(c) Describe how the results you would collect can be recorded, presented and analysed in order to draw conclusions from your investigation.

(3)

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(d) Suggest **two** limitations of your proposed method.

(2)

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(Total for Question 4 = 15 marks)

TOTAL FOR PAPER = 50 MARKS

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