

Please check the examination details below before entering your candidate information

Candidate surname	Other names
Centre Number	Candidate Number
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Pearson Edexcel International Advanced Level

Wednesday 29 October 2025

Afternoon (Time: 1 hour 20 minutes)	Paper reference	WBI16/01
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Biology

International Advanced Level

UNIT 6: Practical Skills in Biology II

<p><b>You must have:</b> Scientific calculator, ruler, HB pencil</p>	Total Marks
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### 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.**

- 1 There are nearly 2000 species of blowfly. They have a worldwide distribution. Some blowfly species lay their eggs on the bodies of dead turkeys. The eggs hatch into maggots that feed on this organic matter. The maggots grow quickly and form pupae. A blowfly emerges from each pupa. The photograph shows blowfly maggots.

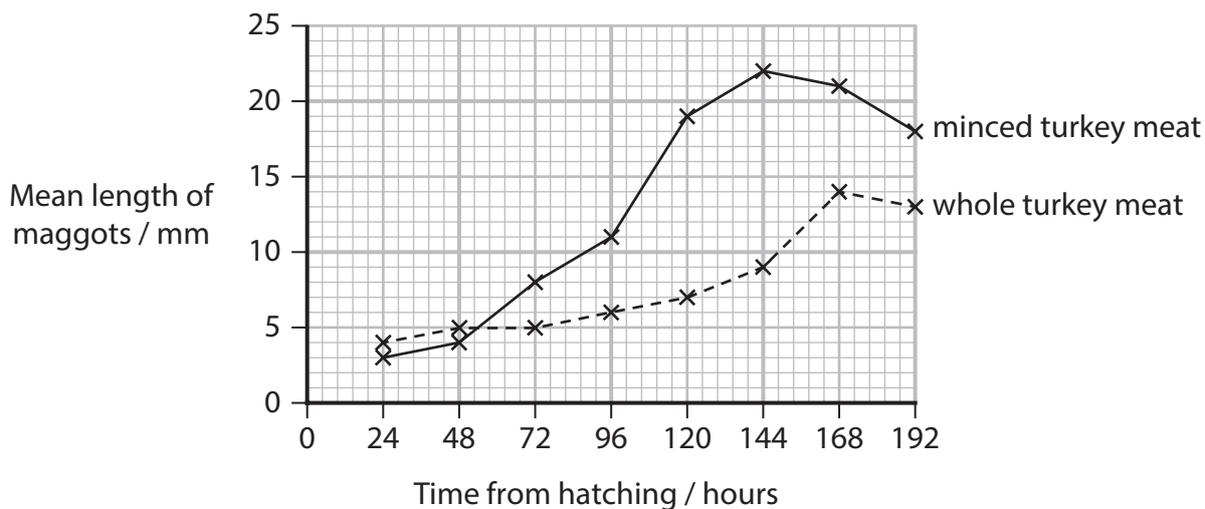


(Source: © Dorling Kindersley Ltd / Alamy Stock Photo)

Magnification  $\times 1$

A student investigated the effect of growing these maggots on whole turkey meat and minced turkey meat for 8 days (192 hours).

The graph shows the results of this investigation.



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(a) (i) The length of a maggot reduces when it stops feeding and forms a pupa.

State the time when the maggots, that feed on **whole** turkey meat, begin to develop into pupae.

(1)

(ii) Calculate the fastest growth rate of blowfly maggots in **minced** turkey meat.

Give your answer with appropriate units.

(2)

Answer .....

(b) Some variables were measured in this investigation.

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

(2)

First variable .....

Second variable .....

(ii) Choose **one** of the variables you have identified in (b)(i).

State how this variable can be controlled.

(1)

Variable .....

Method of control

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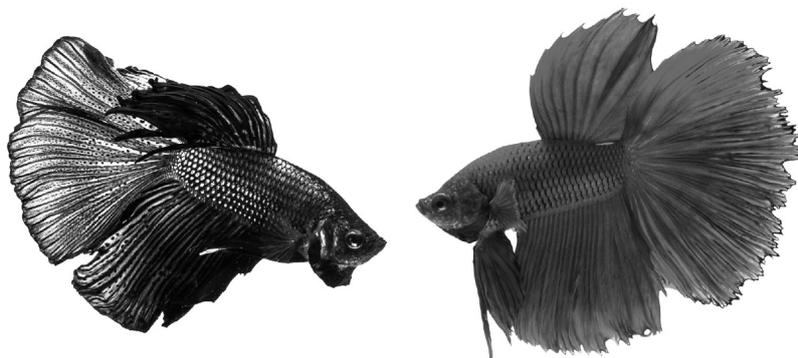
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2 Siamese fighting fish live in rice paddy fields in Southeast Asia.

The photograph shows two male Siamese fighting fish.



(Source: © Suwat Sirivutcharungchit / Alamy Stock Photo)

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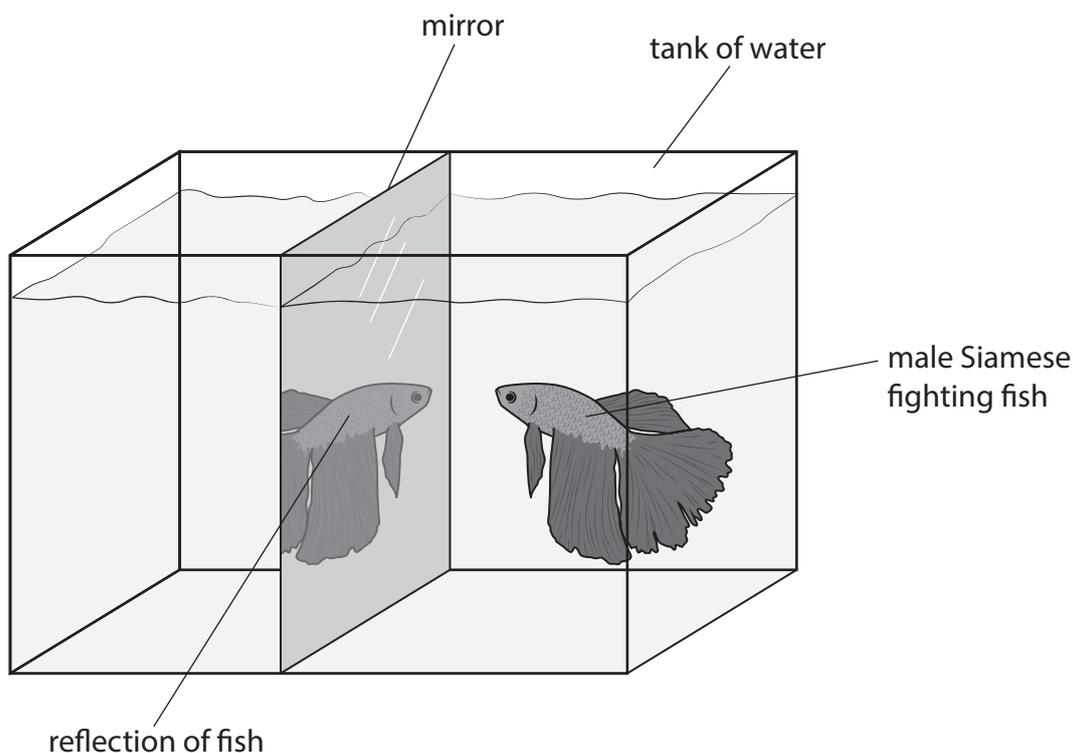
A male fish defends its territory when another male approaches.

The male fish spreads its fins as a threat behaviour, to scare away the other male fish.

A male fish will also display this threat behaviour when it sees its own image reflected in a mirror.

This threat behaviour was used to investigate habituation in these male fish.

The diagram shows the apparatus used in this investigation.







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3 The photograph shows some cows on grassland in central Asia.



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

A scientist investigated the effect of grazing on the plant biomass in three fields.

Three fields each  $150\text{ m} \times 300\text{ m}$  were used:

- Field A had 2 cows
- Field B had 4 cows
- Field C had no cows.

After 120 days, all the parts of the plants above the ground were collected from five  $1\text{ m}^2$  areas in each field.

The results of this investigation:

- Field A biomass /  $\text{g m}^{-2}$     212    198    160    153    148
- Field B biomass /  $\text{g m}^{-2}$     151    158    125    118    128
- Field C biomass /  $\text{g m}^{-2}$     145    211    200    192    203

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

(1)

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

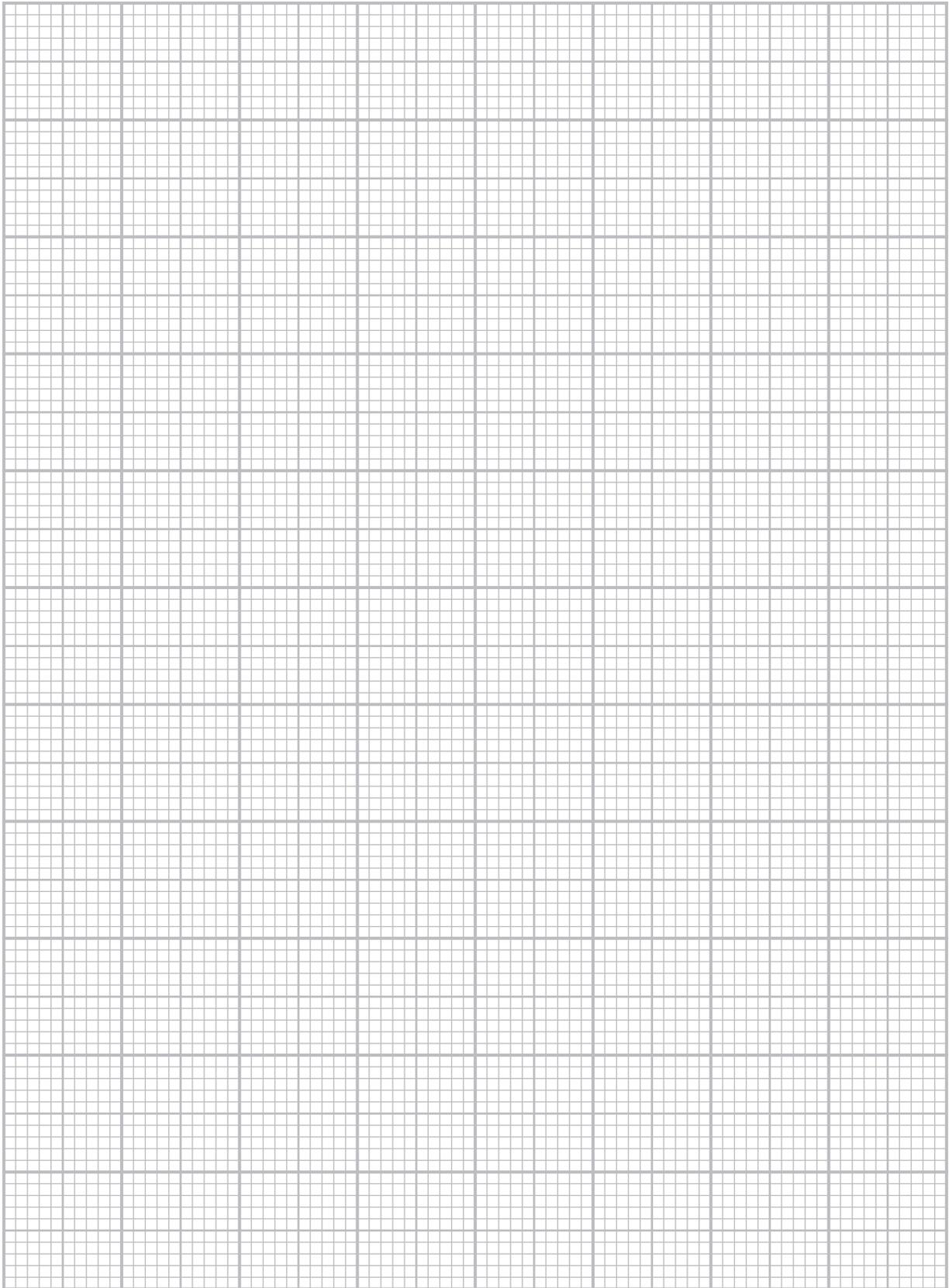
(3)



(c) Draw a suitable graph to show the mean biomass and the number of cows.

Include an indication of the variability of the data.

(3)



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- (d) (i) The scientist decided to analyse the data for field A and field B with a  $t$ -test using the formula

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

where:

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

$n$  is the number of samples for each treatment

$(S_A)^2 = 833.2$  and  $(S_B)^2 = 304.5$

Calculate the value of  $t$ .

(2)

Answer .....





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

(2)

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**(Total for Question 3 = 13 marks)**

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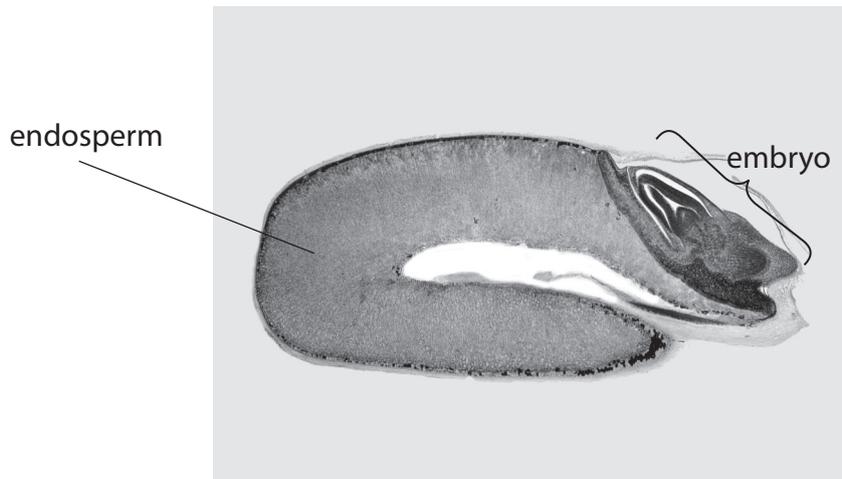
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4 There are many varieties of wheat grown worldwide.

The photograph shows a section through a wheat grain.



(Source: DR KEITH WHEELER / SCIENCE PHOTO LIBRARY)

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The endosperm is a store of starch.

During germination, the embryo stimulates the release of amylase from the cells surrounding the endosperm.

The starch is digested by the amylase to produce maltose. This allows the embryo to grow.

(a) Describe the structure of maltose.

(2)

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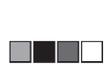
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(b) A student formed the following hypothesis:

*Two varieties of wheat digest starch at different rates.*

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

(i) Describe preliminary practical work that you might undertake to ensure your proposed method would provide quantitative results.

(2)

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

(9)

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(iii) Describe how your results should be recorded, presented and analysed in order to draw conclusions from your investigation.

(3)

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

(2)

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**(Total for Question 4 = 18 marks)**

**TOTAL FOR PAPER = 50 MARKS**

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