UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

4205897888

BIOLOGY **5090/61**

Paper 6 Alternative to Practical **October/November 2010**

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

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1	
2	
3	
Total	

This document consists of **8** printed pages.

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[Turn over

1 An investigation was carried out to show the effect of increasing light intensity on the rate of photosynthesis.

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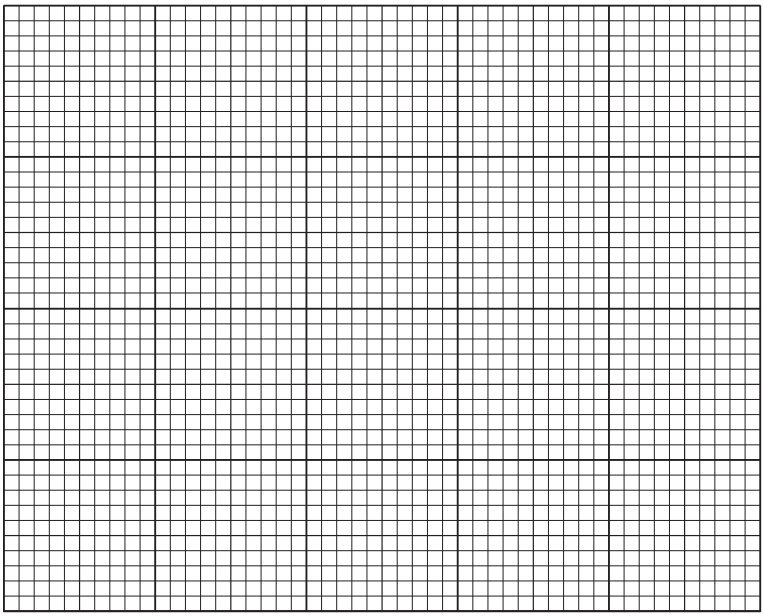
- The rate was measured by recording the amount of carbon dioxide that was absorbed or released.
- Other factors were kept constant.

Table 1.1 shows the results that were obtained.

Table 1.1

light intensity /arbitrary units	carbon dioxide intake /arbitrary units
0	−0.5
2	1.0
4	2.5
6	4.0
8	4.5
12	4.8
16	4.7

(a) (i) Construct a graph on the grid below, from the figures in Table 1.1.



[5]

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(ii) Explain how the graph demonstrates the concept of limiting factors.

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..... [4]

(iii) From your graph determine the light intensity when no carbon dioxide is taken in or released.

..... [1]

(iv) Explain why carbon dioxide is neither taken in nor released at this light intensity.

.....

.....

..... [2]

[Total: 12]

2 Figs. 2.1 and 2.2 show two different insects.

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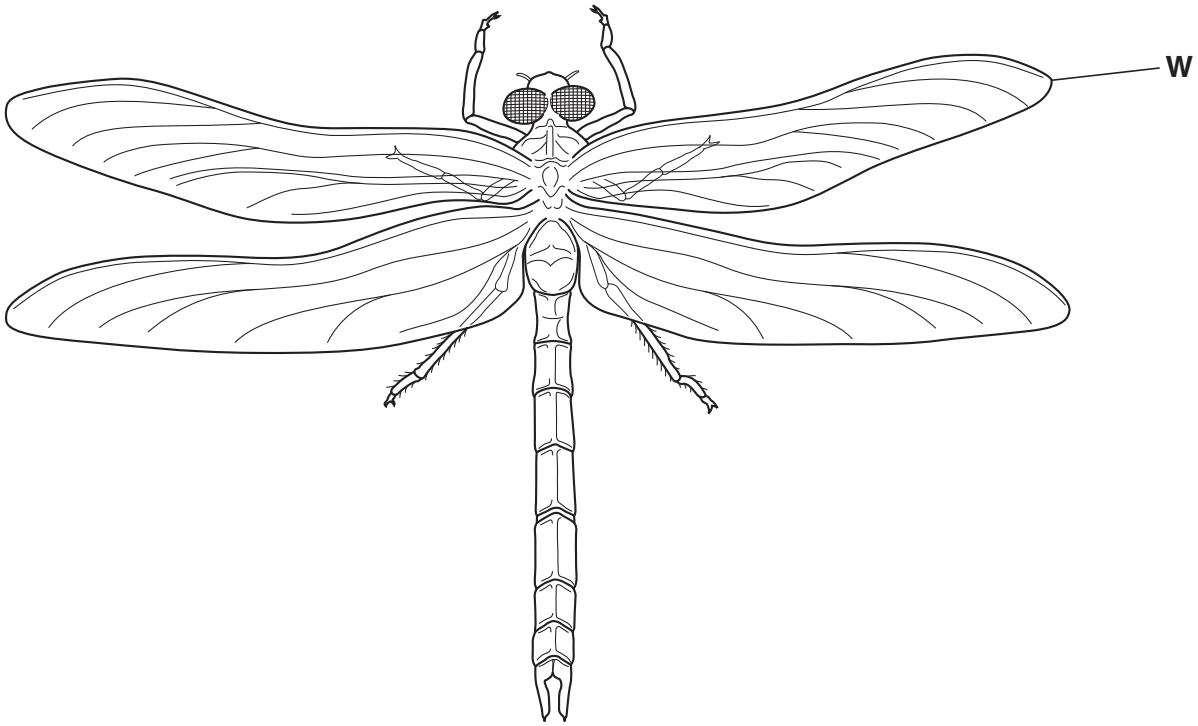


Fig. 2.1

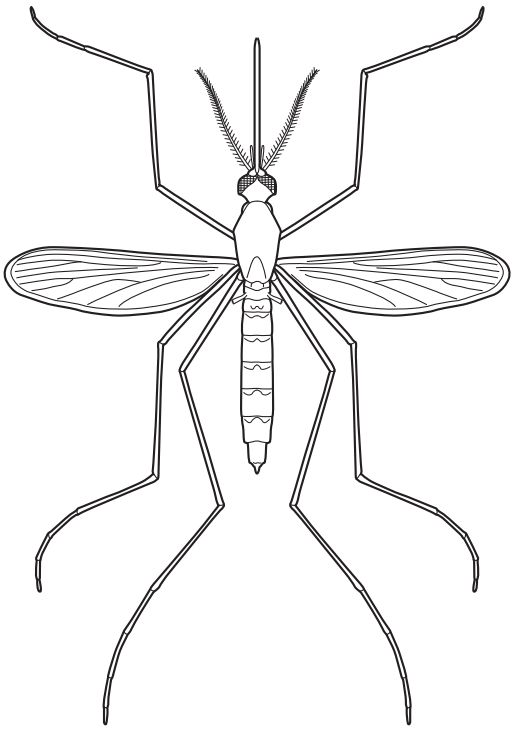


Fig. 2.2 (Not drawn to the same scale)

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(a) List four **visible** features that are the same in both insects.

1. .....

2. .....

3. .....

4. ..... [4]

(b) Complete Table 2.1 with four pairs of differences that are **visible** in these insects.

Table 2.1

	feature in **Fig. 2.1**	same feature in **Fig. 2.2**
1		
2		
3		
4		

[4]

(c) In the specimen from which Fig. 2.1 was made, the length of the wing labelled **W** was 40 mm.

Calculate the magnification of the insect shown in Fig. 2.1.

Show your working clearly.

magnification = ... [3]

[Total: 11]

3 Fig. 3.1 shows a germinating bean seed.

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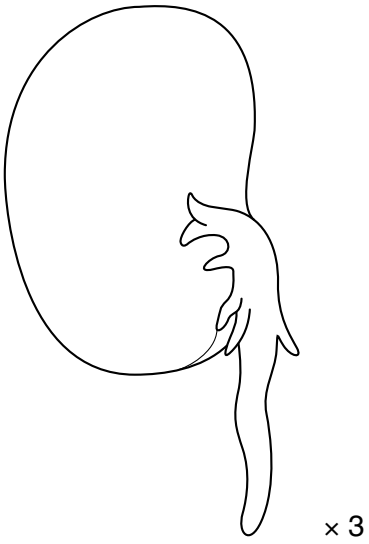


Fig. 3.1

(a) Describe how you would demonstrate that the seed contains:

(i) starch

.....

.....

.....

(ii) protein.

.....

.....

.....

[4]

(b) **(i)** Explain how the protein is taken from the store in the seed to where it is needed for growth.

.....

.....

.....

.....

(ii) Draw arrows on Fig. 3.1 to show the direction of this movement.

[4]

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(c) Fig. 3.2 shows a plant that is able to grow in soil that is short of nitrates, because it can produce protein in an unusual way.

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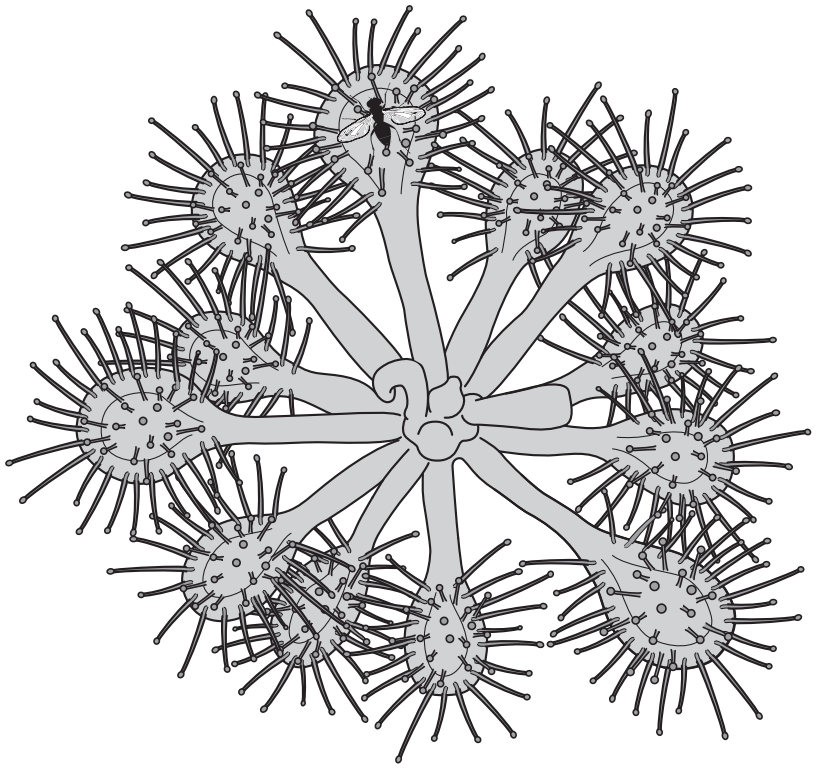


Fig. 3.2

- The leaves attract insects.
- The insects become stuck to the leaves.
- Secretion of enzymes takes place from glands on the leaf.

Suggest how this plant produces protein from the trapped insects.

.....

.....

.....

..... [3]

(d) (i) State how nitrates are of benefit to green plants.

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..... [2]

(ii) Using apparatus like that shown in Fig. 3.3, outline how you could show the effect of nitrates on plant growth.

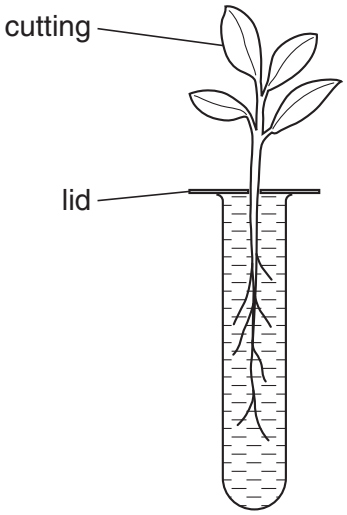


Fig. 3.3

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..... [4]

[Total: 17]

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