



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
January 2014

Centre Number

71

Candidate Number

Biology

Assessment Unit AS 2

assessing

Organisms and Biodiversity

[AB121]



TUESDAY 14 JANUARY, AFTERNOON

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

There is an extra lined page at the end of the paper if required.

Answer **all eight** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 75.

Section A carries 60 marks. Section B carries 15 marks.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

You are reminded of the need for good English and clear presentation in your answers.

Use accurate scientific terminology in all answers.

You should spend approximately **20 minutes** on Section B.

You are expected to answer Section B in continuous prose.

Quality of written communication will be assessed in Section B, and awarded a maximum of 2 marks.

For Examiner's
use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	

Total
Marks

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Section A

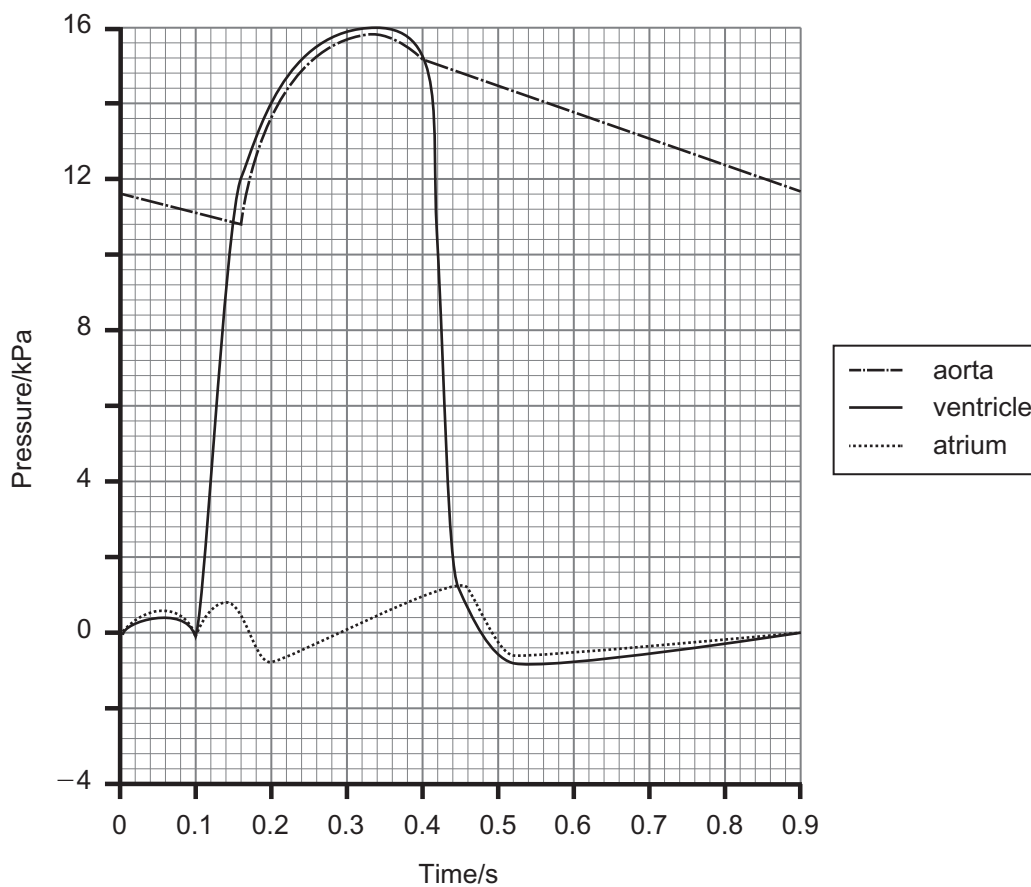
- 1 Read the following passage on classification, and write the most appropriate word in the blank spaces to complete the account.

All organisms can be grouped into one of five kingdoms namely Animalia, Plantae, Fungi, _____ and _____.

Organisms in four of the kingdoms have cells containing membrane-bound organelles, and are therefore classified as _____. Both plant and fungal cells are surrounded by a cell wall which, in the kingdom Fungi, is composed of _____. The cells in kingdom Plantae possess chlorophyll to enable the _____ mode of nutrition, which is typical of this kingdom. [5]

Examiner Only	
Marks	Remark

- 4 (a) The graph below shows pressure changes which take place in the left side of the heart during one complete cardiac cycle.



- (i) State the cause of the increase in ventricular pressure which occurs at 0.1 s.

_____ [1]

- (ii) State the effect of the closure of the semi-lunar valves on blood flow, and give the time at which this occurs in the graph above.

Effect of semi-lunar valves closure _____

Time at which this occurs _____ [2]

- (iii) The maximum pressure generated by the left ventricle, as shown in the graph, differs from that of the right ventricle.

State how the maximum pressure in the right ventricle differs and account for this difference.

[2]

Examiner Only	
Marks	Remark

- (ii) Some scientists have suggested that analysing **total** fat intake in relation to incidence of CHD decreases the validity of the investigation. Suggest why.

 [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

[1]

The formula for calculating D is presented as

where n_i = the total % cover of each individual species
 N = the total % cover of organisms of all species
 (Show your working.)

Answer _____ [2]

- (d) Bog cotton was also found in both bogland locations. Bog cotton possesses a hydrophytic adaptation in the form of aerenchyma tissue. This tissue enables the passage of oxygen to the roots from the leaves.

Explain fully why aerenchyma tissue is a useful adaptation for plants in bogland habitats.

[3]

Examiner Only	
Marks	Remark

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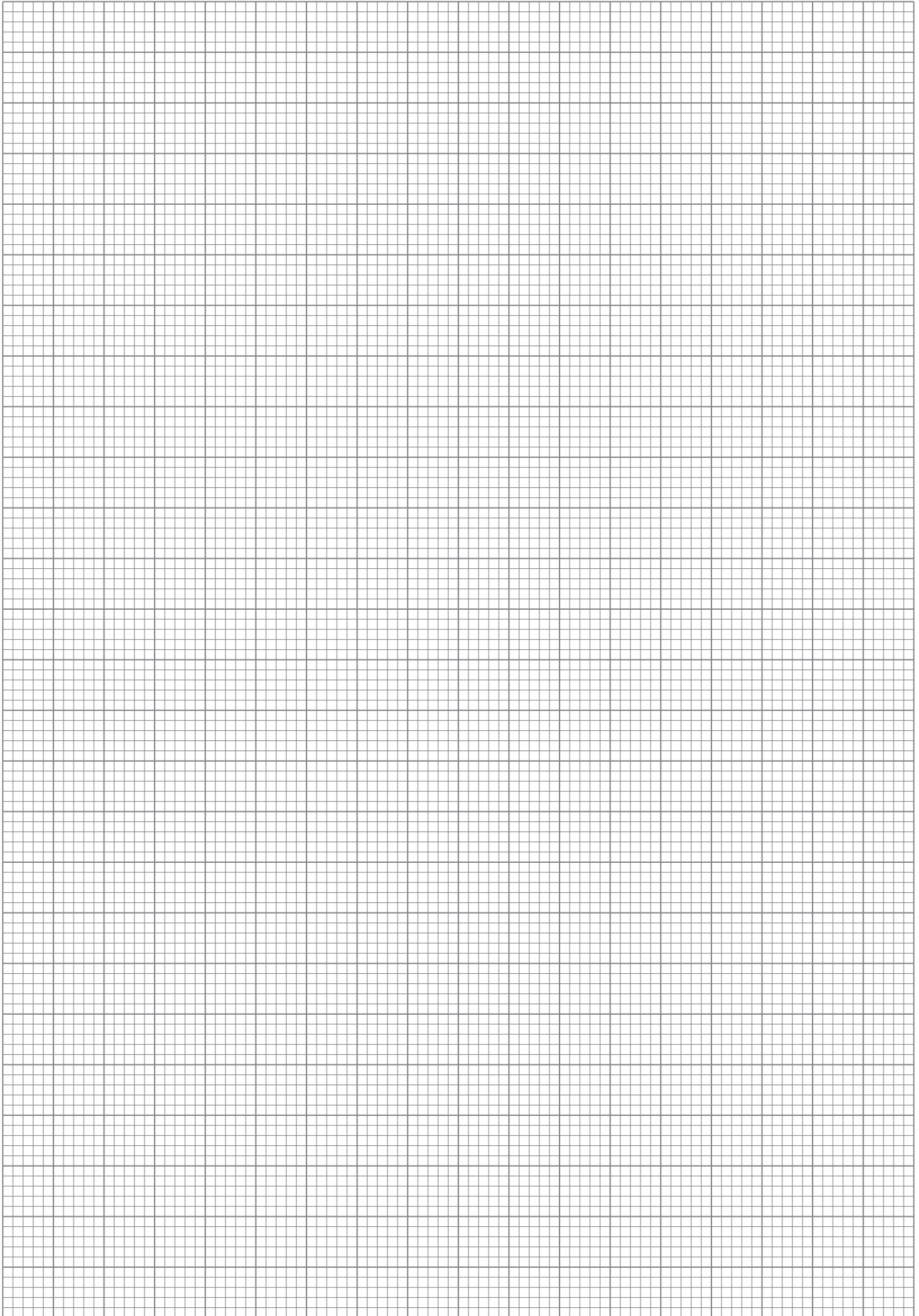
Light intensity/ W m^{-2}	Rate of carbon dioxide uptake/ arbitrary units	
	Species A	Species B
0	−2.0	−2.0
20	1.6	−0.3
40	3.3	1.4
120	4.8	8.2
160	5.1	9.3
240	5.1	9.3

- (b)** Plant species **B** is grown commercially using artificial light sources. Using the graph, determine the light intensity value at which species **B** will grow most economically. Explain your answer.

(c) For each plant species, there is a particular light intensity value which results in no net exchange of carbon dioxide.

[2]

Examiner Only	
Marks	Remark

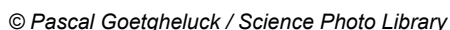


[2]

-
-
-
-
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-
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-
- [3]

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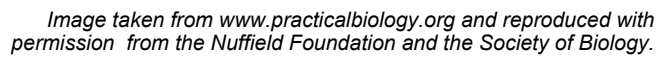


There are surface pores along the sides of the stick insect, which enable air to move in and out. These surface pores are connected internally to a series of fine tubes (resembling bronchioles) to allow the passage of oxygen to the respiring cells.

- (a)** Explain how the body shape of a stick insect assists the diffusion of oxygen which has entered the fine tubes from the atmosphere.

[2]

20

[illegible]9021

[4]

Examiner Only	
Marks	Remark

[illegible]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

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