



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2015

Centre Number

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Candidate Number

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Biology

Assessment Unit AS 2
assessing
 Organisms and Biodiversity



AB121

[AB121]

WEDNESDAY 17 JUNE, MORNING

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.
 You are provided with **Photographs 2.6A** and **2.6B** for use with **Question 6** in this paper. Do not write your answers on these photographs.

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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[5]

Examiner Only	
Marks	Remark

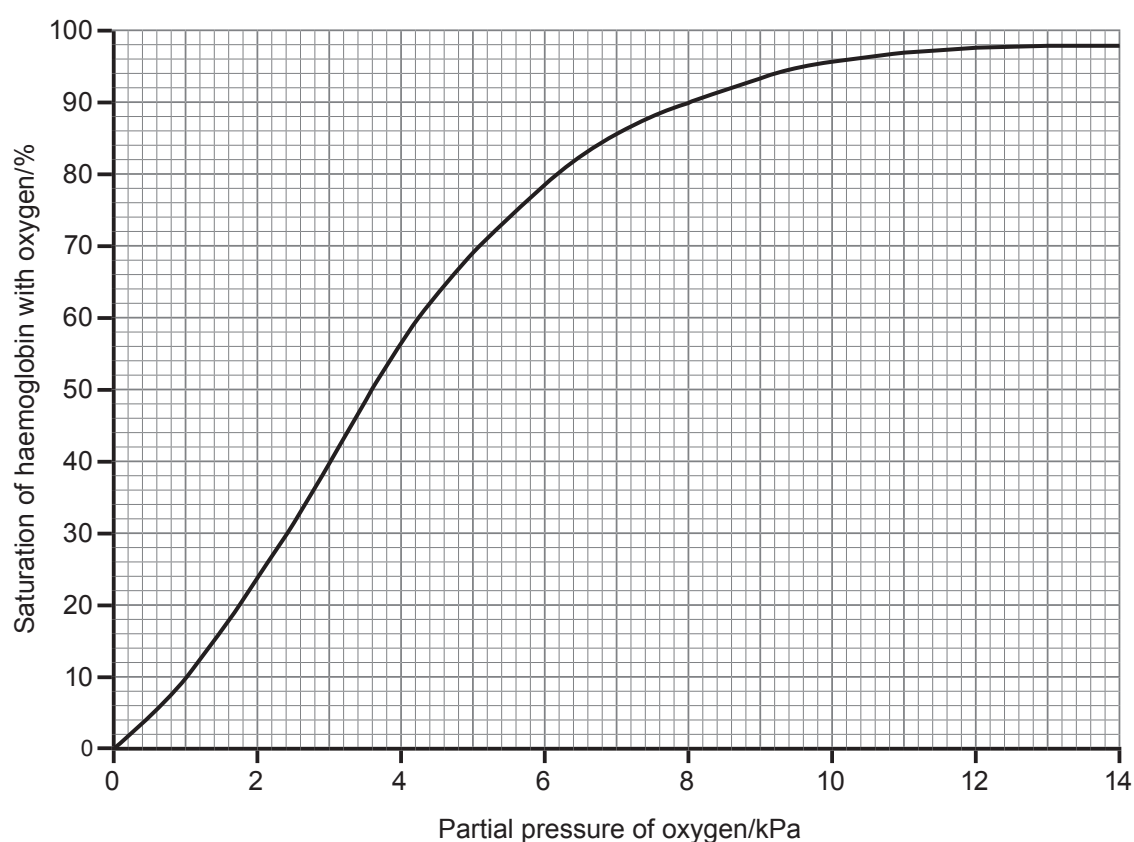
- 2 Red blood cells contain a pigment called haemoglobin which is responsible for the transport of oxygen in the blood.

(a) Describe concisely the structure of a molecule of haemoglobin.

[2]

Examiner Only	
Marks	Remark

The oxygen dissociation curve for human haemoglobin is shown in the graph below.



- (b) (i) On the **horizontal axis** of the graph, indicate with an **X** the approximate partial pressure of oxygen in the alveoli. [1]

(ii) Determine the partial pressure of oxygen which results in 50% saturation of haemoglobin with oxygen.

_____ kPa [1]

Examiner Only	
Marks	Remark

Farming of mink (*Neovison vison*) began in the area in the late 1950s. Escaped mink are known to have established wild populations around the lough. Mink are carnivorous mammals which feed on ground-nesting birds and their eggs.

Using the information provided and your knowledge, answer the following questions.

[1]

[2]

9700

Mammal	Typical body mass/kg	Cell respiration rate/ mm ³ O ₂ g ⁻¹ hr ⁻¹
Mouse	0.03	1518
Rabbit	2.2	466
Dog	12	318
Human	70	202
Horse	700	106
Elephant	3800	67

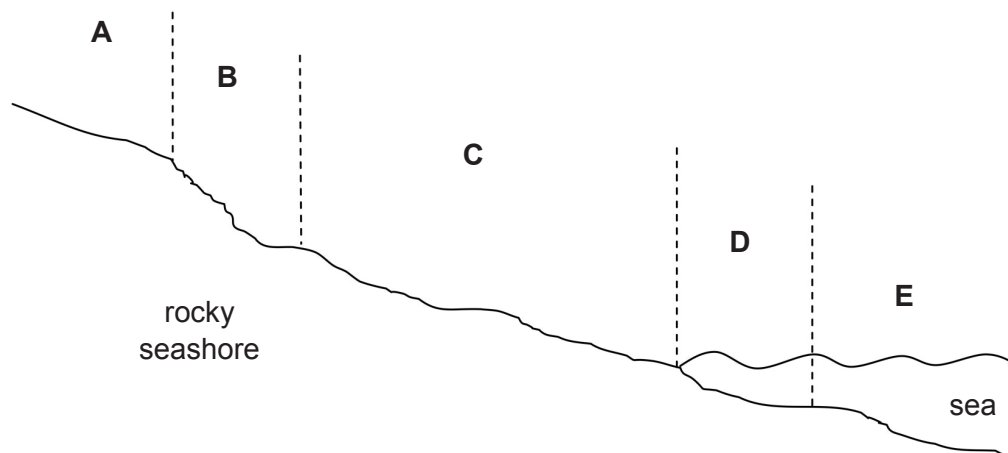
-
-
-
- [1]

- Answer _____ mm³ [2]

8

- 5 Sheltered rocky seashores have distinct zones which result from the extent to which water covers the area during high and low tides.

Zones on a rocky seashore are indicated in the diagram below.



Details of each of the zones **A** to **E** are given in the table below.

Zone	Tidal coverage details	Dominant seaweed species
A	never covered in water but sprayed or splashed with saltwater	no seaweed present
B	only covered in water during the highest tides	channelled wrack, spiral wrack
C	covered in water during most high tides and exposed to air during most low tides	bladder wrack, egg wrack
D	only exposed to air during the lowest tides	saw wrack, thongweed
E	never exposed to air	sugar kelp, oarweed

- (a) (i) A student proposes the hypothesis that seaweeds can only obtain their required minerals when covered in seawater. Identify the evidence from the table which supports this hypothesis.

_____ [1]

- (ii) Name **one** seaweed species from the table which would be expected to have highly developed adaptations to prevent desiccation (drying out).

_____ [1]

- (b) Explain **one** biotic and **one** abiotic factor which may prevent sugar kelp and oarweed from growing further up the shore than zone **E**.

Biotic _____

Abiotic _____

_____ [2]

- (c) Describe a method which could be used to sample a rocky shore in order to determine how the distribution of seaweed species changes from zone **A** to zone **D**. Your answer should include one safety precaution.

_____ [5]

Examiner Only

Marks Remark

6 (a) **Photograph 2.6A** shows a transverse section through an artery.

- (i) Draw a block diagram of this artery in the box below. Label your diagram to show the tissues found in the wall of the artery.



[4]

- (ii) State the function of **one** of the tissues you have labelled in the block diagram.

_____ [1]

Examiner Only	
Marks	Remark

The table below shows the results.

Species	Number of stomata	Stomatal density/ stomata mm ⁻²
A	26	5.78
B	40	8.89
C	37	
D	20	4.44

- (a) (i)** Calculate the stomatal density for species **C**.

_____ stomata mm⁻² [1]

- (ii)** Identify which of the species investigated is most likely to grow in a dry environment. Explain your answer.

[2]

Examiner Only	
Marks	Remarks

(b) (i) Define the term transpiration.

[2]

The leaves of plants growing in dry environments often have microscopic leaf hairs extending from their lower epidermis.

(ii) Explain the advantage of this.

[3]

Examiner Only	
Marks	Remark

[illegible][illegible]

Examiner Only	
Marks	Remark

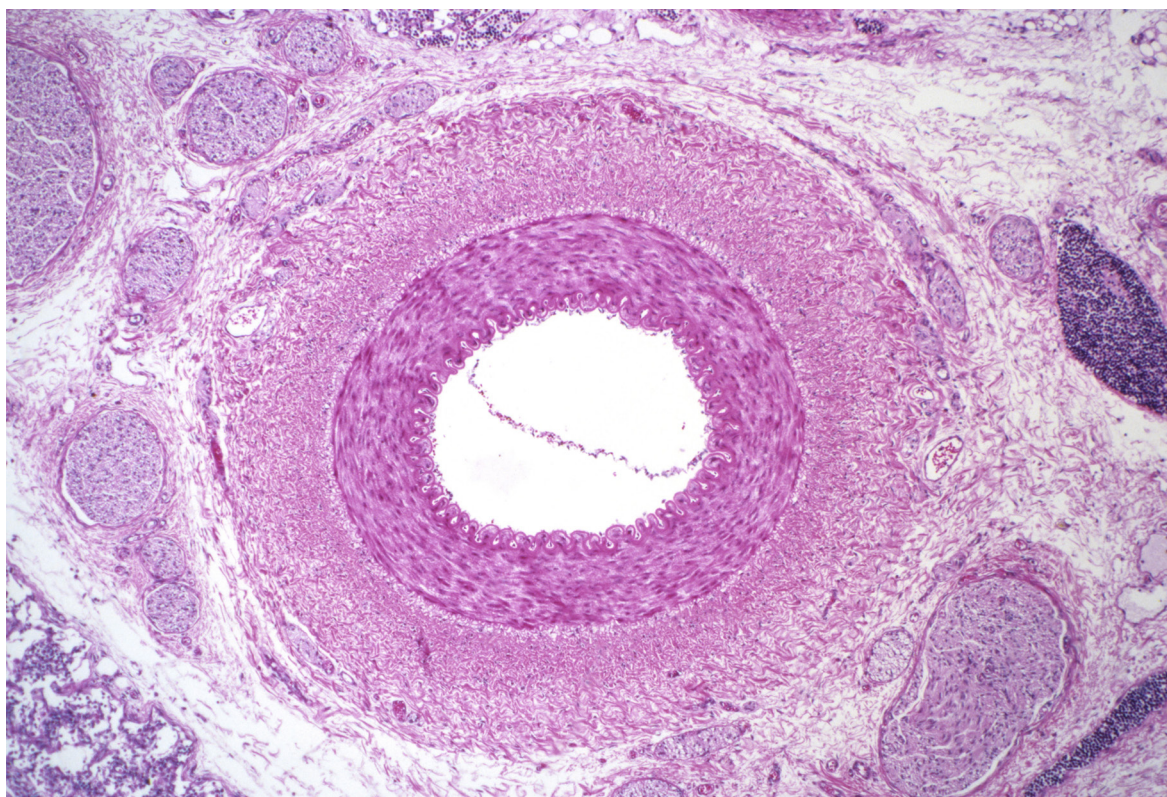
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THIS IS THE END OF THE QUESTION PAPER

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GCE Biology Advanced Subsidiary (AS)
Assessment Unit AS2: Organisms and Biodiversity
2015

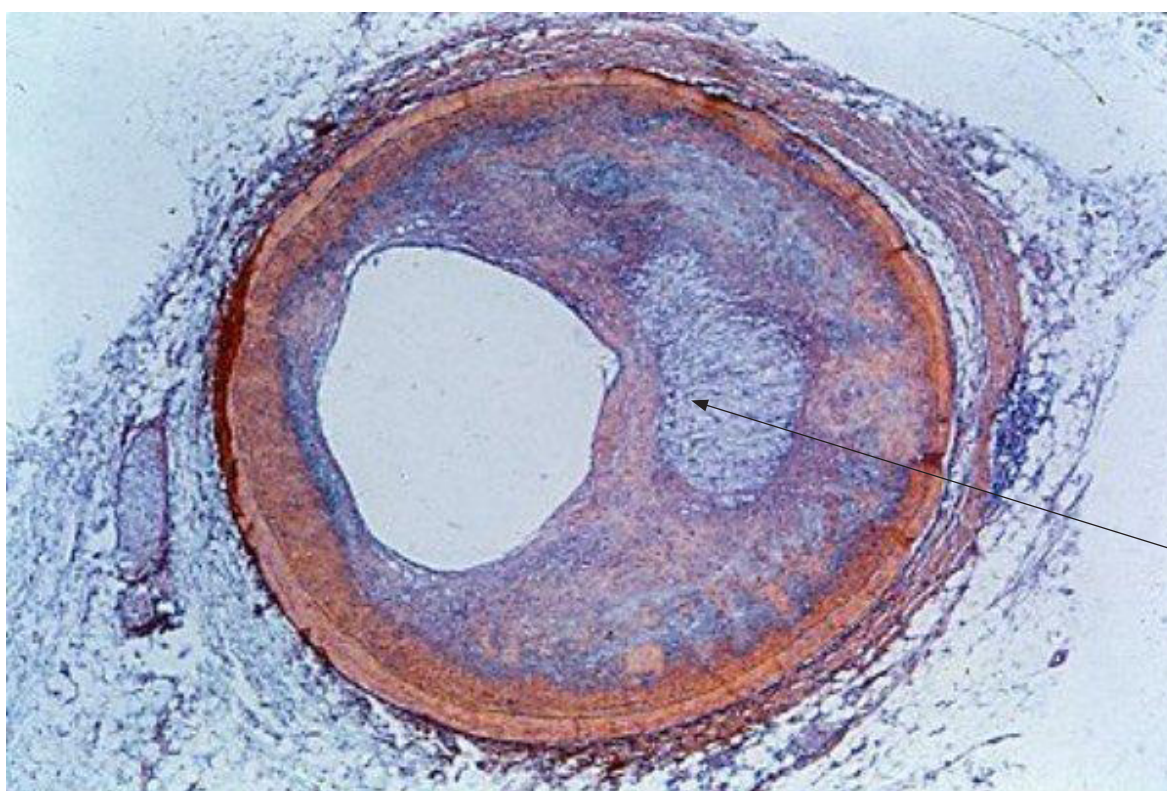
Photograph 2.6A
(for use with Question 6(a))



(C005/1121)

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Photograph 2.6B
(for use with Question 6(b))



X

Source: National Human Genome Research Institute

<http://www.genome.gov/dmd/img.cfm?node=Photos/Technology/Cells%20and%20biological%20pathways&id=63763>