Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						6	1	0	2	/	0	1	Signature	

Paper Reference(s)

6102/01

Edexcel GCE

Biology

Advanced Subsidiary

Unit Test 2B

Tuesday 3 June 2008 – Morning

Time: 1 hour

Examiner's use only		

Team Leader's use only		

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
Total	

Materials required for examination
Ruler

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature.
The paper reference is shown above.
Check that you have the correct question paper.
Answer ALL EIGHT questions in the spaces provided in this booklet.
Show all the steps in any calculations and state the units. Calculators may be used.
Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for individual questions and parts of questions are shown in round brackets: e.g. **(2)**.
The total mark for this paper is 60.

Advice to Candidates

You will be assessed on your ability to organise and present information, ideas, descriptions and arguments clearly and logically, taking account of your use of grammar, punctuation and spelling.

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Answer ALL questions in the spaces provided.

1. Read through the following account of the human menstrual cycle, and then write on the dotted lines the most appropriate word or words to complete the account.

At the start of the menstrual cycle, the ..... pituitary gland secretes ....., which stimulates the growth and development of a number of primordial .....

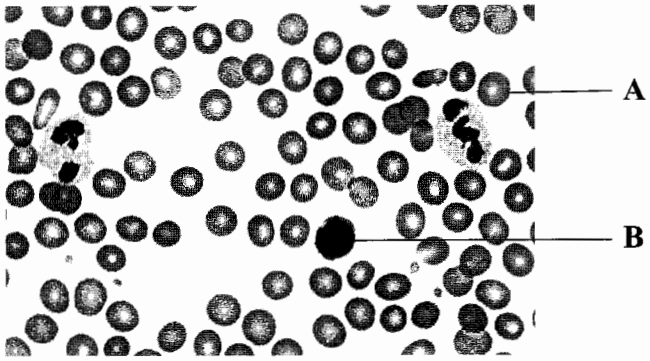
Usually, only one of these reaches full maturity and, on about day 14 of the cycle, this ruptures to release a .....

Q1

(Total 4 marks)

Leave blank

2. The photograph below shows human blood cells, as seen using a light microscope.



Magnification ×1000

(a) Name the cells labelled A and B.

A .....

B .....

(2)

(b) Explain how the shape of cell A is related to its functions.

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(2)

(c) Describe the roles of leucocytes (white blood cells) in defence against disease.

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(3)

(Total 7 marks)

Q2

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3. Tissue fluid is formed as a result of the blood pressure forcing water and dissolved solutes, such as glucose and mineral ions, out of capillaries.

(a) Explain how the structure of a capillary is related to the formation of tissue fluid.

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(3)

(b) Suggest why proteins are present in the plasma but are not normally present in tissue fluid.

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(2)

(c) Tissue fluid is reabsorbed back into capillaries as a result of the osmotic effect of the plasma proteins. Suggest why this reabsorption is reduced in a person on a protein-deficient diet.

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(2)

Q3

(Total 7 marks)

Leave blank

4. (a) Describe how starch is digested in humans.

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(3)

(b) Most of the absorption of monosaccharides occurs in the small intestine. The small intestine has a number of features to increase the efficiency of absorption. Explain how each of the following assists in the uptake of monosaccharides.

(i) Presence of a highly-folded mucosa

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(2)

(ii) Presence of capillaries within the villi

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(2)

Leave blank

(c) The table below shows the relative rates of absorption of three monosaccharides, galactose, glucose and fructose.

Monosaccharides	Relative rates of absorption (compared with glucose)
Fructose	0.4
Galactose	1.1
Glucose	1.0

(i) Compare the rates of absorption of these three monosaccharides.

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(2)

(ii) Suggest a reason for the difference between the rates of absorption of glucose and fructose.

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(1)

Q4

(Total 10 marks)

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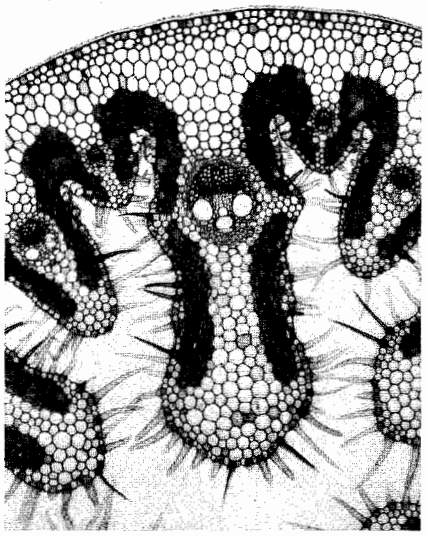
5. The photograph below shows a transverse section through part of a leaf of *Ammophila*, as seen using a light microscope. *Ammophila* is a plant which is adapted to living in a dry environment.



Magnification ×100

(a) Describe and explain **three** ways in which the leaves of plants, such as *Ammophila*, are adapted to their environment.

1 .....

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2 .....

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3 .....

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(6)

(b) Suggest **one** way in which the structure of a leaf of a **hydrophyte** might differ from the structure of a leaf of *Ammophila*.

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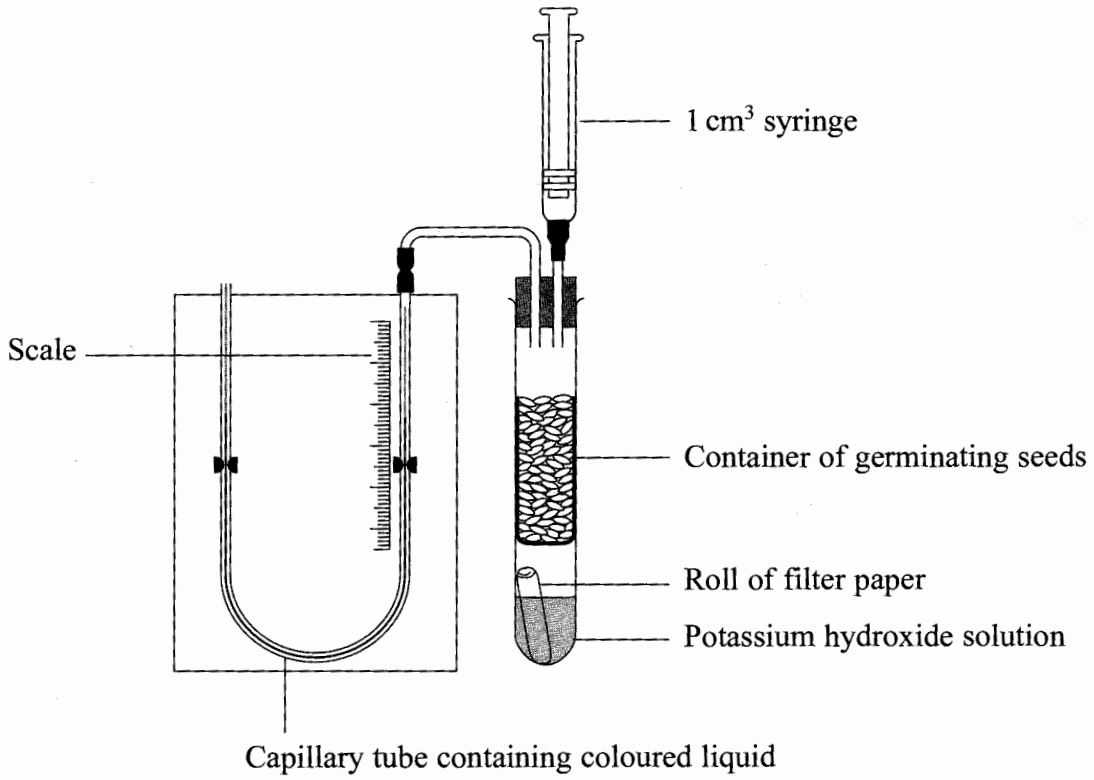
(1)

Q5

(Total 7 marks)

Leave blank

6. The diagram below shows a simple respirometer used to investigate gas exchange in germinating seeds.



(a) Suggest a function for each of the following.

(i) The syringe

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(1)

(ii) The potassium hydroxide solution

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(1)

Leave blank

(b) Suggest why immersing the respirometer in a water bath helps to ensure that the results are reliable.

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(2)

(c) In an investigation to measure the rate of oxygen uptake by the seeds, the coloured liquid moved 12 mm up the right hand side of the capillary tube in 15 minutes. The cross-sectional area of the capillary tube is 0.19 mm^2.

Calculate the volume of oxygen taken up per minute by the seeds.
Show your working.

Answer = ... mm^3 oxygen min^{-1}

(3)

Q6

(Total 7 marks)

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7. (a) Describe the pathways taken by water as it travels from the epidermis of a root to a xylem vessel.

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(4)

(b) In an investigation, the rate of transpiration of a sunflower plant was measured at 2-hourly intervals between 08.00 hours and 22.00 hours.

The results of this investigation are shown in the table below.

Time of day (24 hour clock)	Rate of transpiration / arbitrary units
08.00	5
10.00	32
12.00	42
14.00	50
16.00	41
18.00	30
20.00	5
22.00	3

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(i) Describe the changes in the rate of transpiration from 08.00 hours until 22.00 hours.

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(3)

(ii) Suggest an explanation for the changes in the rate of transpiration during each of the following time intervals.

08.00 hours until 14.00 hours

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.....

14.00 hours until 20.00 hours

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.....

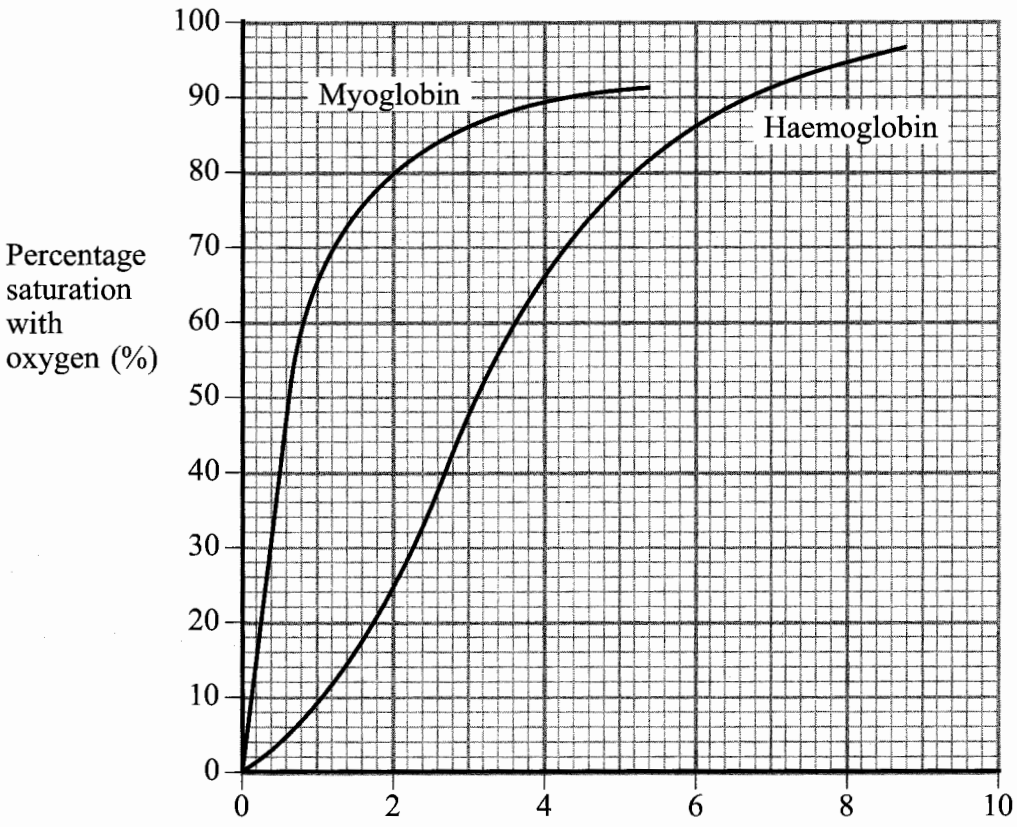
(2)

Q7

(Total 9 marks)

Leave blank

8. (a) The graph below shows oxygen dissociation curves for human myoglobin and human haemoglobin.



From the graph, find the partial pressure of oxygen at which myoglobin and haemoglobin are 50% saturated with oxygen.

(i) Myoglobin ..... kPa

(1)

(ii) Haemoglobin ..... kPa

(1)

Leave blank

(b) Describe the role of **myoglobin**.

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(3)

(c) At increased partial pressures of carbon dioxide, the oxygen dissociation curve for haemoglobin moves to the right. This is known as the Bohr effect.

Explain the importance of the Bohr effect.

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(4) **Q8**

(Total 9 marks)

TOTAL FOR PAPER: 60 MARKS

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