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

Monday 6 June 2005 – Morning

Time: 1 hour

Materials required for examination	Items included with question papers
Ruler	Nil

Examiner's use only

Team Leader's use only

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

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature.
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 passage on blood cells, and complete the passage by writing the most appropriate word or words in the spaces provided.

Leucocytes (white blood cells) include neutrophils, lymphocytes and

..... Neutrophils have a lobed nucleus but lymphocytes have

a ..... nucleus.

The function of neutrophils is to engulf pathogens in a process known as

..... Lymphocytes secrete ..... in

response to antigens.

(Total 4 marks)

Q1

Leave blank

2. (a) Describe **three** properties of haemoglobin that enable it to function efficiently as a respiratory pigment.

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(3)

(b) Myoglobin is a pigment found in muscle cells. Explain the role of this pigment in muscle cells.

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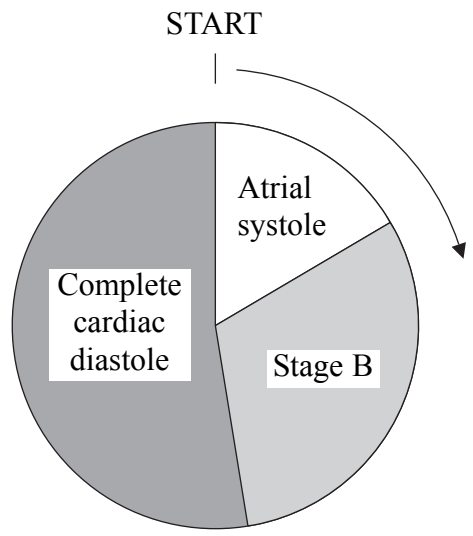
(3)

Q2

(Total 6 marks)

Leave blank

3. The diagram below represents the sequence of stages during one complete cardiac cycle.



(a) Name Stage B.

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(1)

(b) Describe what is happening in the heart during complete cardiac diastole.

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(2)

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(c) Describe how cardiac muscle is supplied with oxygen.

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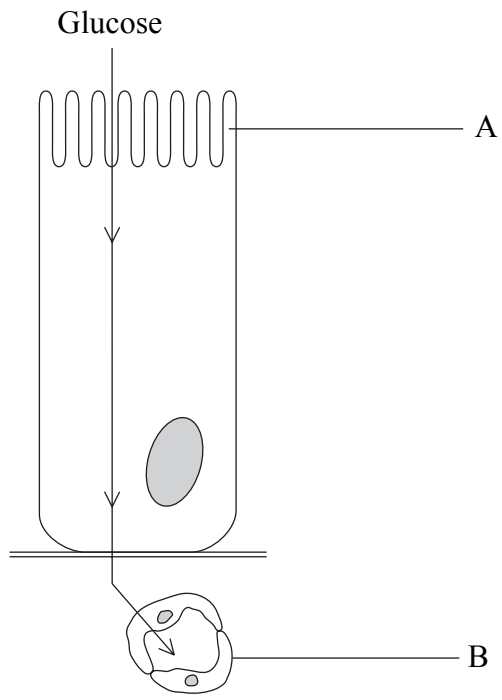
(3)

Q3

(Total 6 marks)

Leave blank

4. The diagram below shows absorption of glucose into an epithelial cell lining the ileum and the movement of glucose into a blood vessel.



(a) Name the cell structure labelled A and the type of blood vessel labelled B.
In each case explain how they function to assist in glucose absorption.

Cell structure A

Name .....

Function .....

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(3)

Blood vessel B

Name .....

Function .....

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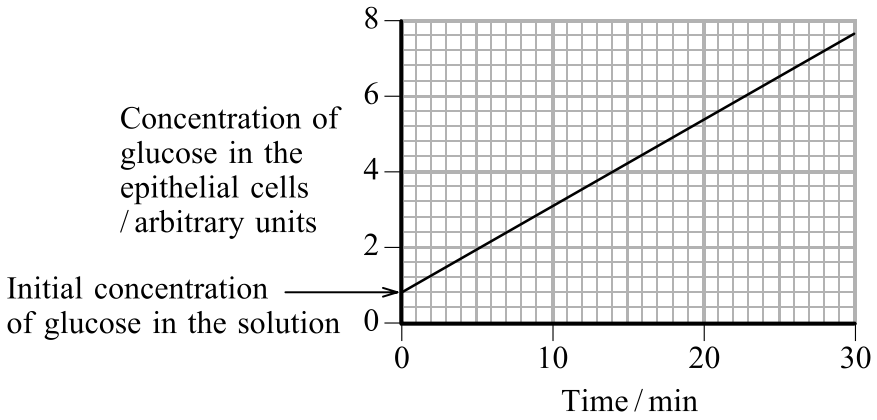
(3)

Leave blank

(b) An investigation was carried out into the uptake of glucose by the epithelial cells of the ileum. A small piece of the wall of the ileum was placed in a solution of glucose. The concentration of glucose in this solution was lower than the concentration of glucose inside the epithelial cells. The results of this investigation are shown in the graph below.



With reference to the graph, explain how glucose is absorbed into the epithelial cells.

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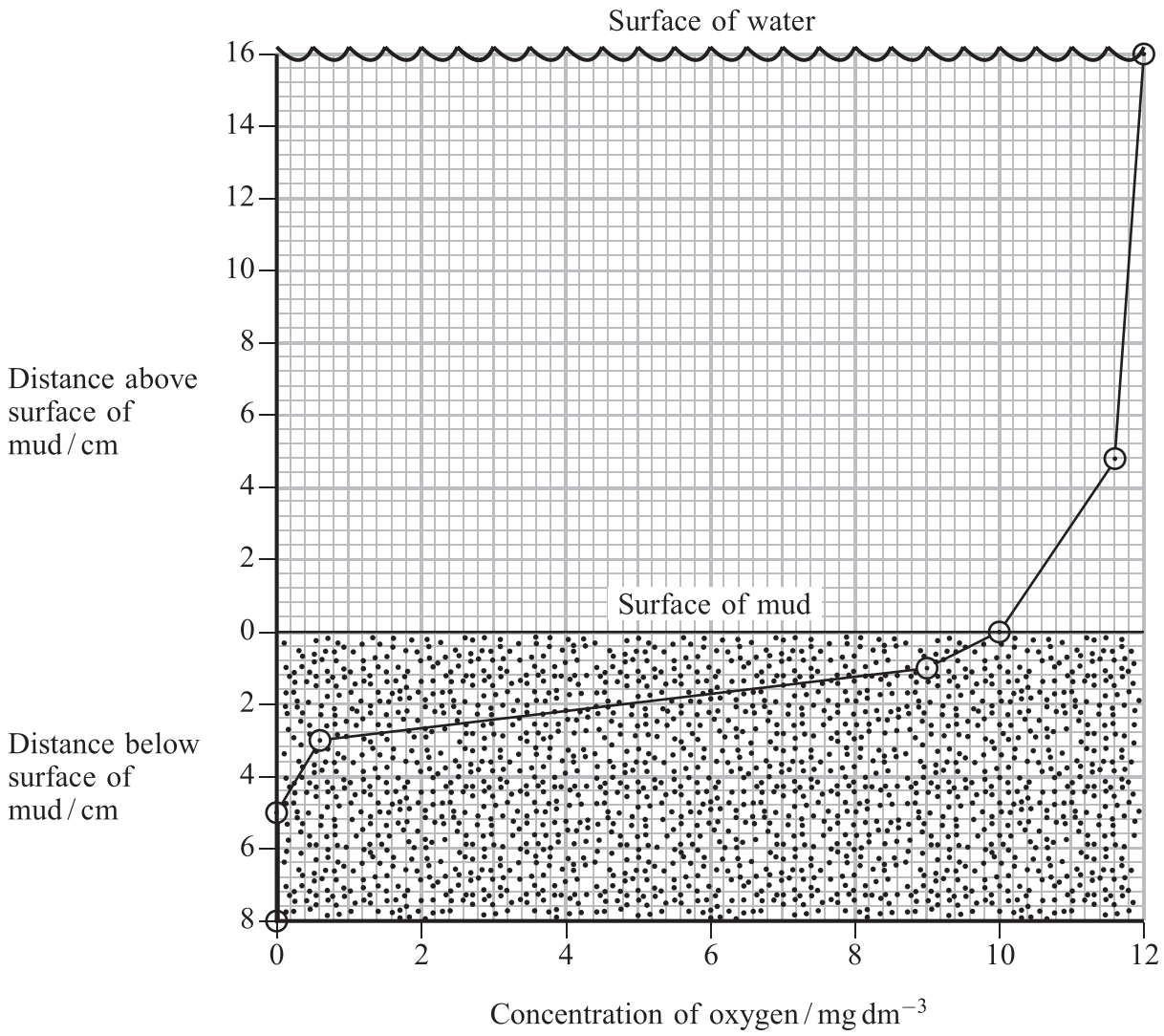
(4)

Q4

(Total 10 marks)

Leave blank

5. (a) The graph below shows the dissolved oxygen concentrations at different depths above and below the mud at the bottom of a freshwater lake.



(i) Describe how the oxygen concentration changes with depth.

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(2)

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(ii) Suggest how an invertebrate might be adapted to survive the oxygen concentration 3 cm below the surface of the mud.

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(3)

(b) The photograph below shows an axolotl, an amphibian that lives in freshwater habitats in North America.

Describe **one** feature, visible in the photograph, which shows how axolotls are adapted for living in an aquatic habitat.

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(2) **Q5**

(Total 7 marks)

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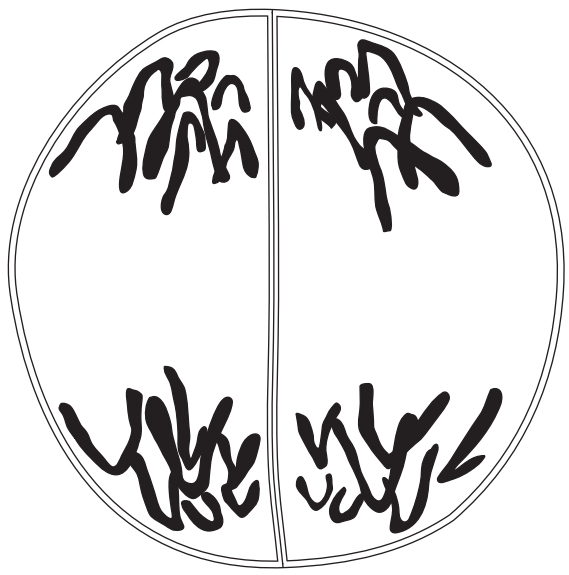
6. The diagram below shows a stage in the division of a cell from the male part of a flower.
The diploid number of chromosomes for this plant is 14.



(a) State the exact location of such a cell in the male part of a flower.

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(1)

(b) Identify the stage of meiosis shown in the diagram.

.....

(2)

(c) Fertilisation in a plant involves different types of cells and nuclei.
State the number of chromosomes present in each of the following in this plant.

A pollen tube nucleus .....

A female gamete (egg cell) .....

A zygote nucleus .....

An endosperm cell .....

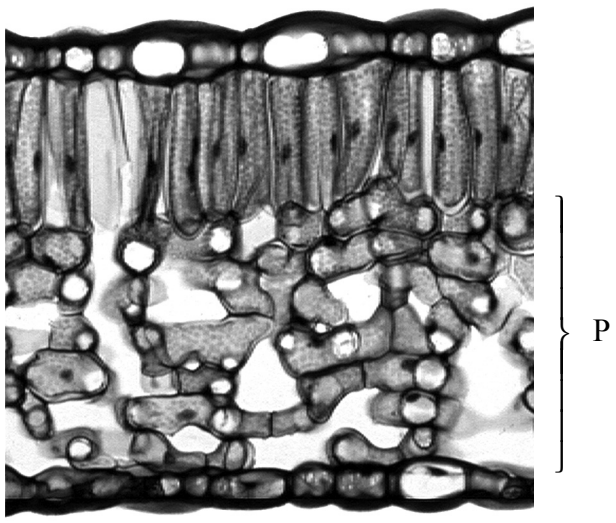
(4)

Q6

(Total 7 marks)

Leave blank

7. (a) The photograph below shows a section through part of a leaf, as seen using a light microscope.



(i) Name the tissue labelled P.

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(1)

(ii) Describe how tissue P is adapted for the function of gas exchange.

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(3)

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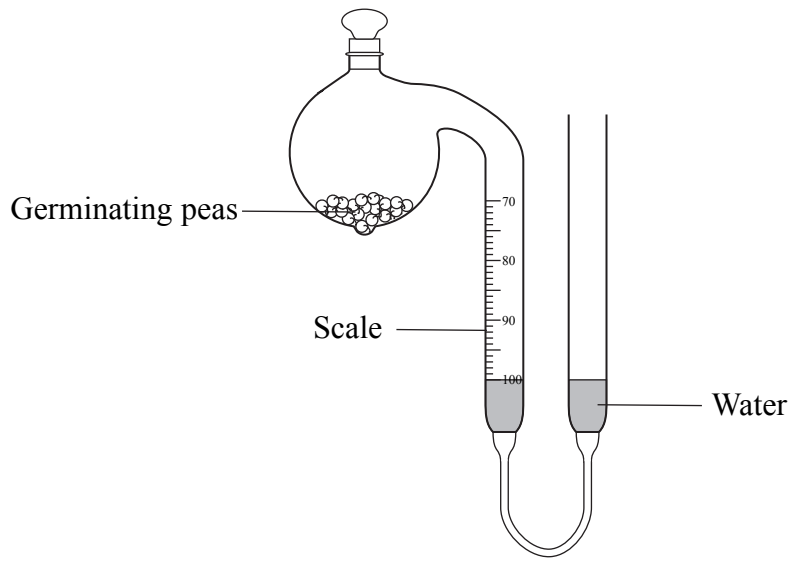
(b) The diagram below shows a type of respirometer being used to investigate gas exchange in germinating peas.



(i) The respirometer was set up as shown, and left for 3 days. During this time, the levels of the water in the tube did not change.

What does this indicate about the volume of oxygen used and the volume of carbon dioxide produced by the peas?

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(1)

(ii) The experiment was repeated using potassium hydroxide solution instead of water in the tube. Potassium hydroxide solution absorbs carbon dioxide. After 3 days the level of the solution in the left hand tube had risen from 100 cm^3 to 93 cm^3.

Calculate the mean volume of oxygen used by the seeds per day, during this experiment. Show your working.

Answer .....

(3)

Q7

(Total 8 marks)

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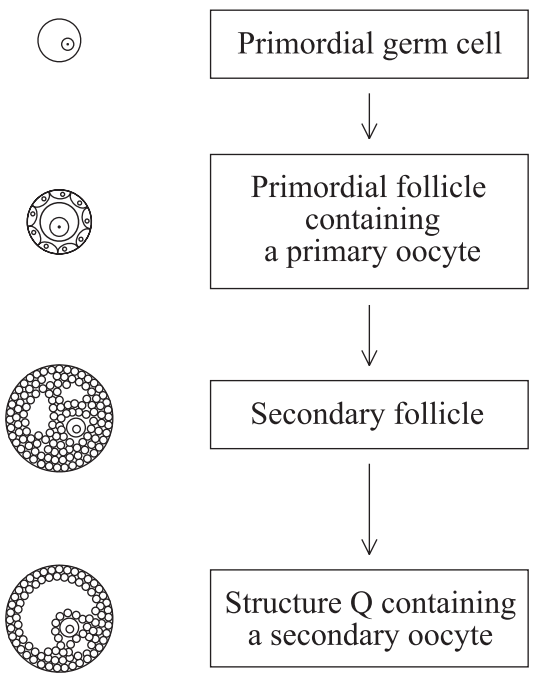
8. (a) The diagram below shows some of the stages during the development of a human ovum.



(i) On the diagram, write the letter M to show when the first division of meiosis is complete.

(1)

(ii) Name structure Q, shown in the diagram.

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(1)

(iii) After ovulation, structure Q develops to form a corpus luteum. Name **two** hormones that are secreted by the corpus luteum.

1 .....

2 .....

(2)

Leave blank

(b) Describe the process of fertilisation in humans.

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(3)

(c) After fertilisation, the blastocyst implants in the endometrium. By the fourth week of pregnancy a placenta has developed. Describe the functions of the placenta.

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(5)

Q8

(Total 12 marks)

TOTAL FOR PAPER: 60 MARKS

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