

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**Advanced Subsidiary GCE**

**BIOLOGY**  
Biology Foundation



**2801**

Monday                      **5 JUNE 2006**                      Morning                      1 hour

Candidates answer on the question paper.  
Additional materials:  
Electronic calculator  
Ruler (cm/mm)

Candidate Name

Centre Number 

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Candidate Number 

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**TIME** 1 hour

**INSTRUCTIONS TO CANDIDATES**

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers, in blue or black ink, in the spaces provided on the question paper.
- Read the questions carefully before starting your answer.
- Pencils may be used for graph or diagrams only.
- Do not write in the bar code. Do not write in the grey area between the pages.
- **DO NOT WRITE IN THE AREA OUTSIDE THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA WILL NOT BE MARKED.**

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- You will be awarded marks for the quality of written communication where this is indicated in the question.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.

<b>FOR EXAMINER'S USE</b>		
Qu.	Max.	Mark
1	9	
2	10	
3	16	
4	8	
5	8	
6	9	
<b>TOTAL</b>	<b>60</b>	

**This question paper consists of 12 printed pages.**



Answer **all** the questions.

1 (a) State what ecologists mean by the following terms:

(i) *habitat*

.....[1]

(ii) *niche*

.....[1]

(iii) *ecosystem*.

.....  
 .....[1]

(b) Two more terms commonly used by ecologists are *population* and *community*.

State the difference between a *population* and a *community*.

.....  
 .....[1]

(c) Fig. 1.1 shows the transfer of energy through a food chain in a wood.

The figures represent the energy in the levels of the ecosystem in  $\text{MJ m}^{-2} \text{y}^{-1}$ .

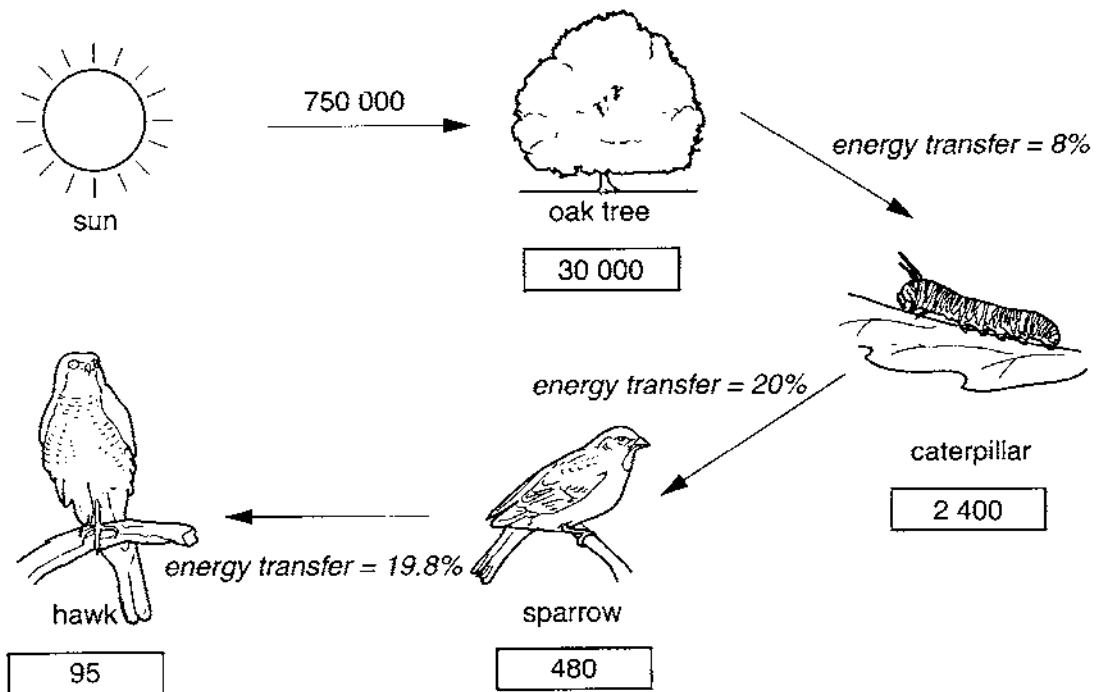


Fig. 1.1



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- 2 (a) Table 2.1 shows information about tests that identify three different types of biological molecule.

Complete the table to show the names of the types of molecule that are tested, the reagents used and the results obtained.

Table 2.1

type of molecule tested	reagents used	positive result	negative result
protein	..... ..... .....	..... .....	blue solution
.....	alcohol and water	white emulsion	clear liquid
starch	..... .....	.....	yellow solution

[5]

- (b) A student followed a procedure to find the concentration of reducing sugars in a fruit juice. The first part of the method used was as follows:

- A range of glucose solutions of different concentrations was made up, starting with a  $20 \text{ g dm}^{-3}$  glucose solution.
- Each solution was boiled with excess Benedict's solution.
- When there was no further change in colour, the liquid was cooled and filtered.
- The absorbance of the liquid was measured with a colorimeter. (A colorimeter measures the amount of light that is absorbed by a coloured solution.)

The student's results are shown in Fig. 2.1.

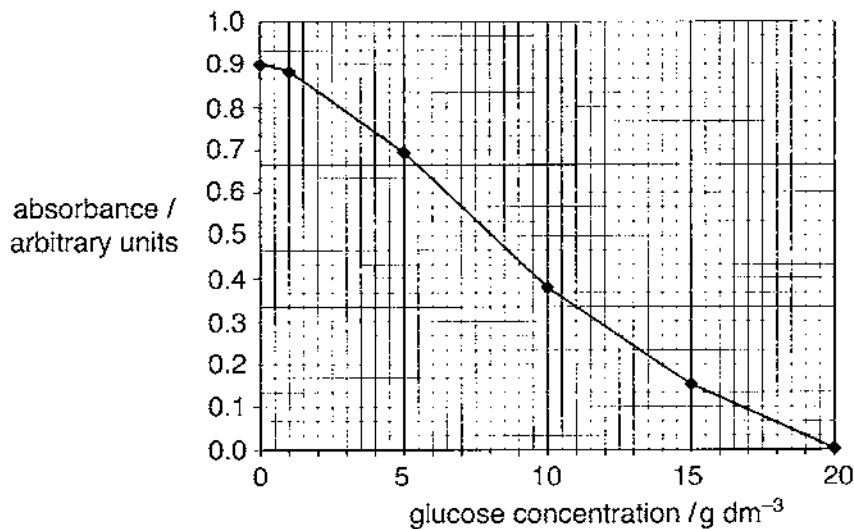


Fig. 2.1



- (i) State **two** precautions that the student should have taken during the procedure to ensure that the results give a valid comparison between the different glucose solutions.

1 .....

.....

2 .....

..... [2]

- (ii) In the second part of the method, the student tested the fruit juice. The absorbance reading obtained was 0.60 arbitrary units.

Use Fig. 2.1 to determine the reducing sugar concentration of the fruit juice.

..... g dm<sup>-3</sup> [1]

- (iii) This procedure does **not** test for non-reducing sugars, such as sucrose.

How should the procedure be altered to determine the concentration of **non-reducing sugar** in the fruit juice?

.....

.....

.....

.....

.....

..... [2]

[Total: 10]

[Turn over



3 Fig. 3.1 is a drawing of an alveolus together with an associated blood capillary.

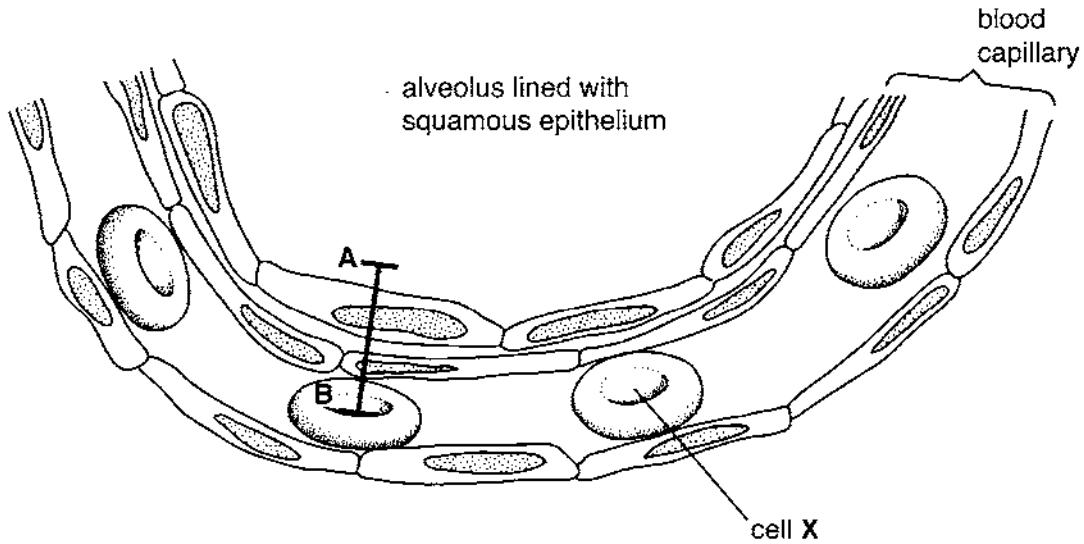


Fig. 3.1

(a) (i) State a feature, **visible in Fig. 3.1**, that shows that squamous epithelial cells are eukaryotic.

.....[1]

(ii) State why squamous epithelium is described as a tissue.

.....  
 .....[1]

(iii) State **two** features of a gas exchange surface, such as the lining of the alveolus.

1 .....  
 2 .....[2]

(b) Oxygen diffuses from the alveolus into cell X. Cell X carries oxygen around the body in the blood stream.

(i) **Name** the compound inside cell X that combines with oxygen.

.....[1]

(ii) **Name** the metal ion required for the formation of the compound in (b)(i).

.....[1]

(c) The line **AB** in Fig. 3.1 represents an actual distance of 1.5 μm.

Calculate the magnification of the drawing. Show your working.

Answer = x ..... [2]













The bacteria were allowed to continue to grow in the 'light' nitrogen,  $^{14}\text{N}$ , until the DNA had replicated once more. The DNA was analysed as before and the result is shown in Fig. 6.3.

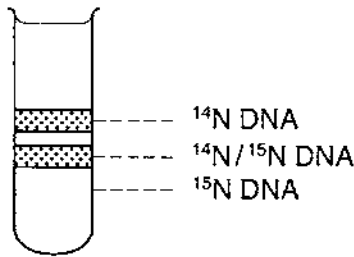


Fig. 6.3

Fig. 6.4 shows simple diagrams of DNA molecules, indicating the nitrogen content of each.

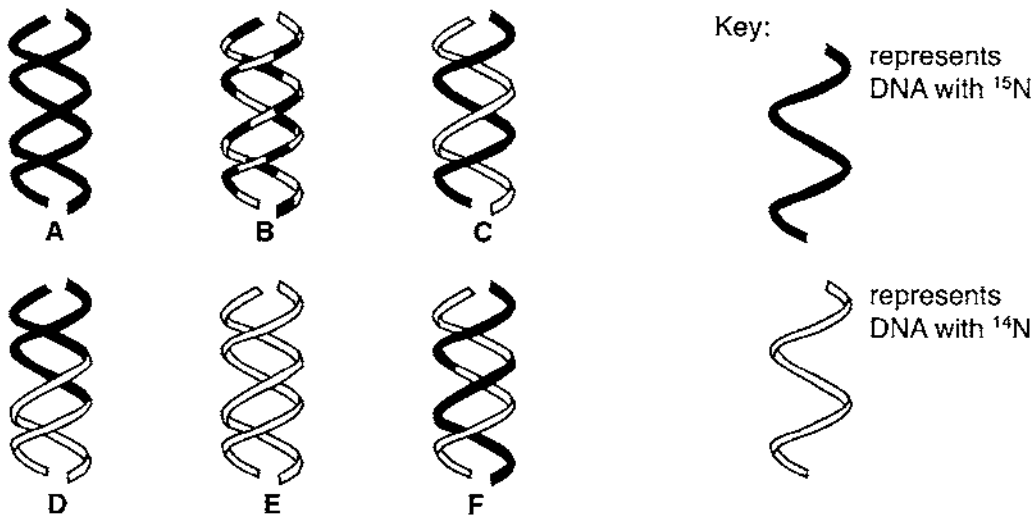


Fig. 6.4

(b) Select the letter or letters from Fig. 6.4 representing the bacterial DNA in Fig. 6.1, Fig. 6.2 and Fig. 6.3.

Fig. 6.1 .....

Fig. 6.2 .....

Fig. 6.3.....[3]

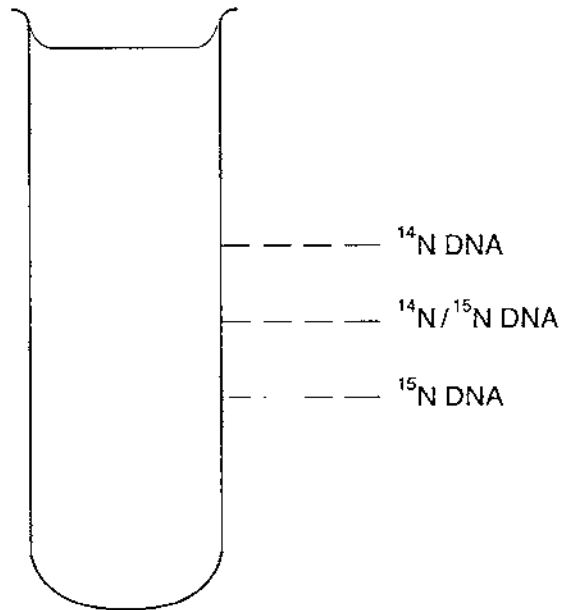
Question 6 continues on the next page.

Turn over



- (c) The bacteria were allowed to continue to grow in the 'light' nitrogen,  $^{14}\text{N}$ , until the DNA had replicated once more. The DNA molecules were analysed as before.

Complete the diagram to indicate the expected results showing the composition of these DNA molecules.



[2]

[Total: 9]

**END OF QUESTION PAPER**