Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

BIOLOGY **0610/02**

Paper 2

October/November 2004

1 hour 15 minutes

Candidates answer on the Question Paper.
No additional materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
The number of marks is given in brackets [ ] at the end of each question or part question.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

FOR EXAMINER'S USE	
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	

This document consists of **16** printed pages.

1 Use the dichotomous key, Fig. 1.1, to identify the five vertebrate groups, **A**, **B**, **C**, **D** and **E**.

Complete Table 1.1.

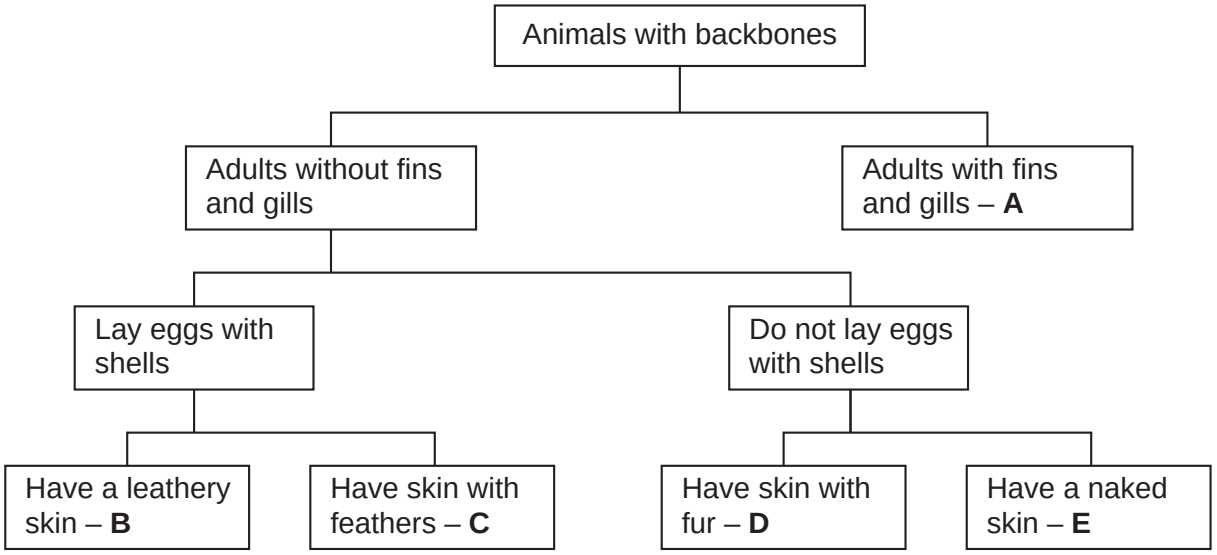


Fig. 1.1

Table 1.1

letter in key	name of vertebrate group
A	
B	
C	
D	
E	

[4]

[Total: 4]

2 **(a)** Complete the table to show two differences between cells produced by mitosis and those produced by meiosis.

	cell produced by mitosis	cell produced by meiosis
1		
2		

[2]

(b) **(i)** Mutations can occur during mitosis and meiosis. Define the term *mutation*.

.....

.....[1]

(ii) State two factors that can increase the rate at which mutations occur.

1 .....

2 .....[2]

(iii) Name a condition caused by a mutation that produces a cell with an extra chromosome.

.....[1]

[Total: 6]

[Turn over

3 Fig. 3.1 shows the male reproductive system.

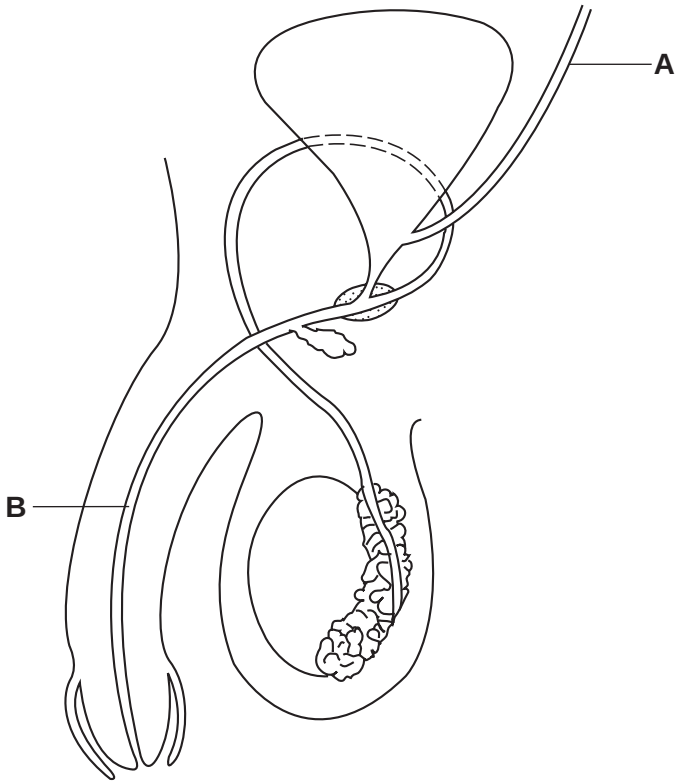


Fig. 3.1

(a) Name the structures labelled **A** and **B**.

A .....

B .....[2]

(b) Label on Fig. 3.1, with the appropriate letter, where

(i) seminal fluid is produced – **S**. [1]

(ii) gametes are formed – **G**. [1]

(iii) testosterone is produced – **T**. [1]

(c) List three secondary sexual characteristics that are stimulated by testosterone.

1 .....

2 .....

3 .....[3]

(d) Identify with an **X**, on Fig. 3.1, where surgery would normally be carried out to bring about birth control. [1]

(e) **(i)** HIV is a virus that can be sexually transmitted. State how its transmission can be prevented during sexual intercourse.

.....[1]

(ii) State two methods, other than by sexual intercourse, by which HIV can be passed from person to person.

1 .....

2 .....[2]

(f) State the difference in function of the urethra in males and females.

.....

.....[1]

[Total: 13]

[Turn over

4 Photosynthesis is a vital process in plants.

(a) Write an equation for photosynthesis using either words or chemical symbols.

.....[2]

(b) **(i)** State where in a leaf cell photosynthesis occurs. .....

.....[1]

(ii) Complete this sentence.

During photosynthesis ..... energy is changed to ..... energy. [2]

(c) The main product of photosynthesis can be converted into other chemicals.

Complete the table.

Use of main product of photosynthesis	Name of chemical it is converted into
Storage in leaf cells	
To make plant cell walls	

[2]

(d) The formation of new cells in the roots requires materials formed in the leaves.

Describe how these materials reach the roots from the leaves.

.....

.....

.....

.....[3]

(e) Forests are sometimes cleared by "slash and burn", in which the trees and other plants are cut down and burnt.

(i) Suggest two effects that "slash and burn" deforestation can have on the carbon cycle.

1 .....

.....

2 .....

.....[2]

(ii) State two undesirable effects that deforestation can have on the soil.

1 .....

.....

2 .....

.....[2]

[Total: 14]

5 Fig. 5.1 shows a front view of the eye as seen in bright light.

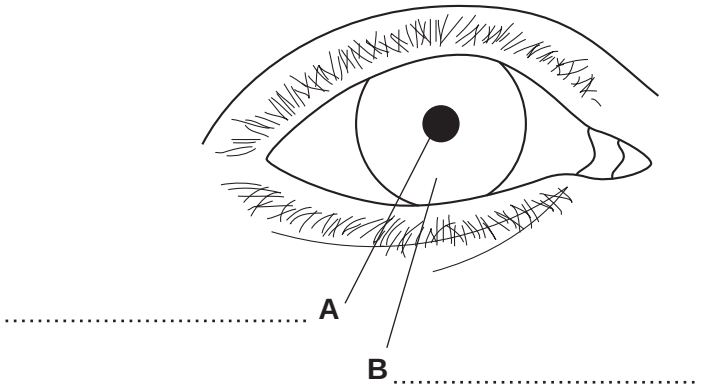


Fig. 5.1

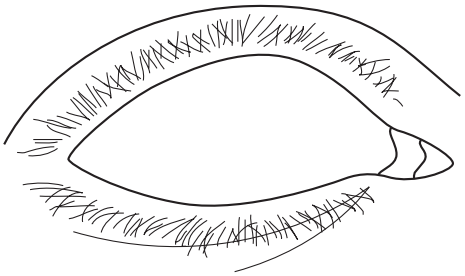
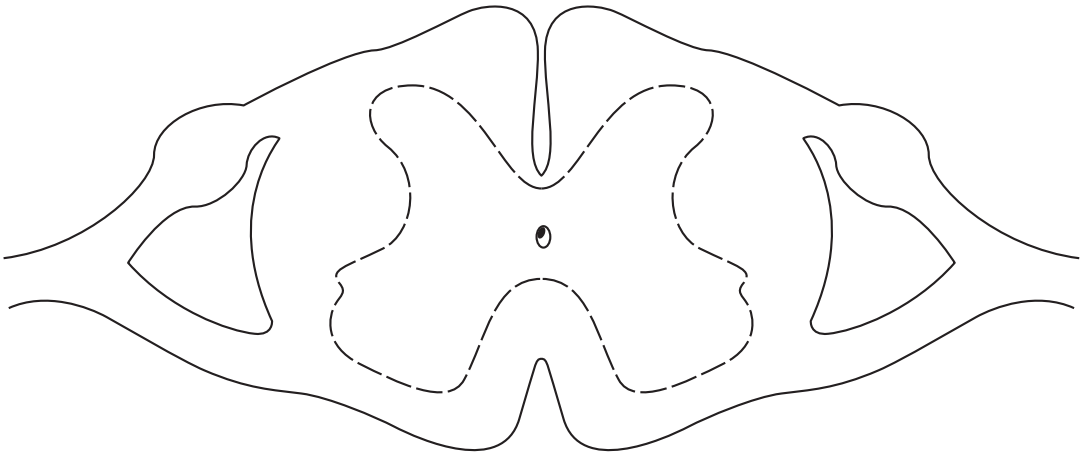


Fig. 5.2

(a) (i) On Fig. 5.1, label parts **A** and **B**. [2]

(ii) Complete Fig. 5.2 to show a view of the same eye as it would appear in dim light. [1]

(b) (i) Complete and label, Fig. 5.3, of a reflex arc.



[5]

Fig. 5.3

(ii) Identify the receptor in the pupil (iris) reflex.

.....[1]

(c) Fig. 5.4 shows changes in the curvature of the lens of a person's eye.

At different times the person was looking at a bird high up in the sky, talking to a friend, and reading a book, not necessarily in this order.

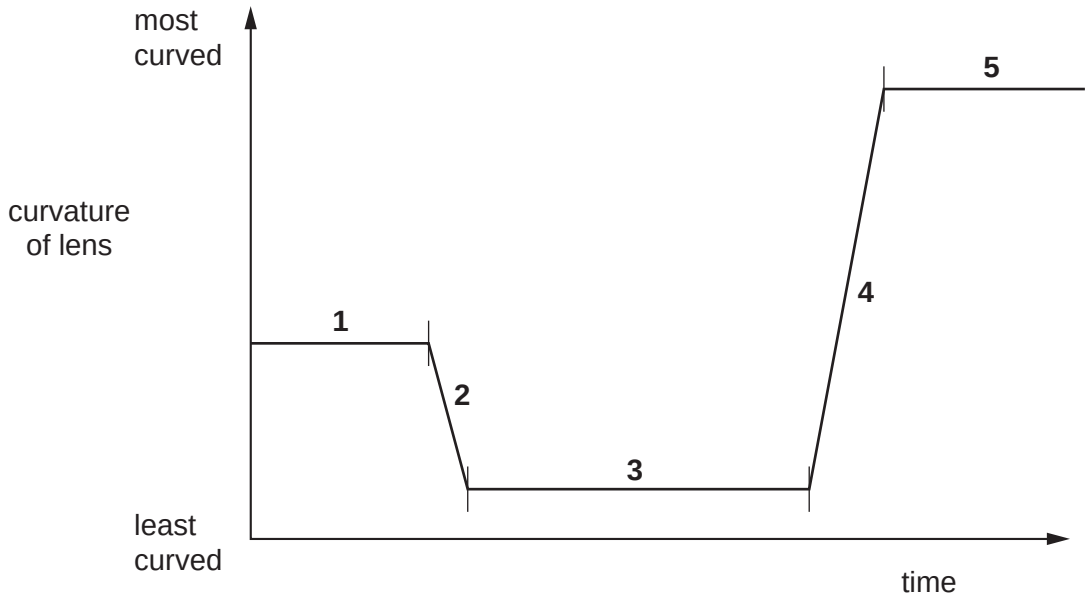


Fig. 5.4

Identify the period of time, **1**, **2**, **3**, **4** or **5**:

(i) when the person was looking at the bird high up in the sky;

..... [1]

(ii) when the person's ciliary muscles were changing from being relaxed to being contracted.

..... [1]

[Total: 11]

6 **(a)** Fig. 6.1 shows a food chain.

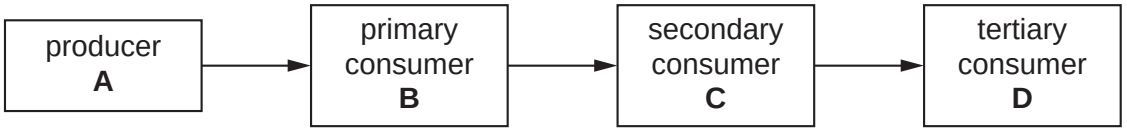


Fig. 6.1

(i) State which organism, **A**, **B**, **C** or **D**, in the food chain produces oxygen.

..... [1]

(ii) Fig. 6.2 shows a pyramid of numbers and a pyramid of biomass for this food chain.

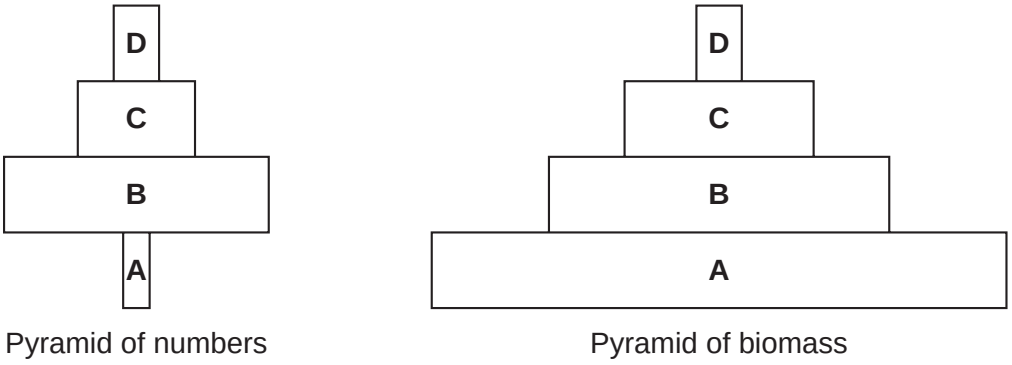


Fig. 6.2

Describe and explain the difference in the shape of these two pyramids.

.....

.....

.....[2]

(iii) There are always smaller numbers of organism **D** than organism **C** in this food chain. Suggest **two** reasons for this.

.....

.....

.....[2]

(b) Fig. 6.3 shows the food chain after the arrival of another primary consumer, **E.**

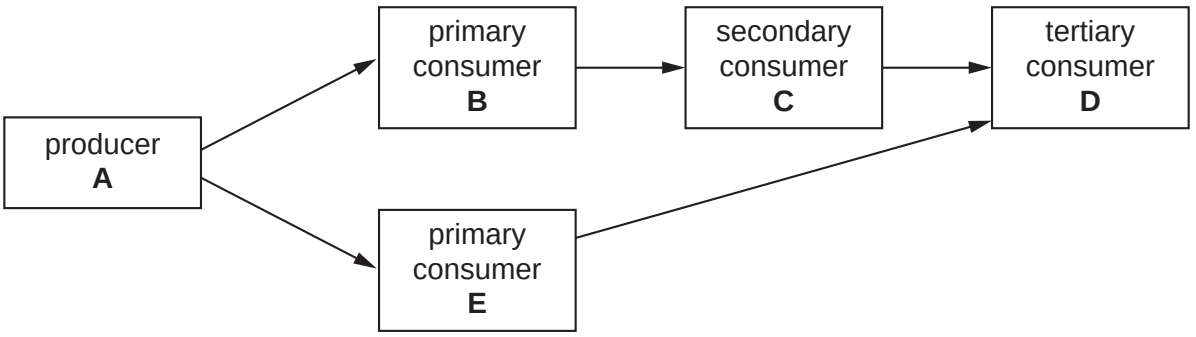


Fig. 6.3

At first the numbers of organism **E** rise but later they level off. Suggest three reasons why the population size of organism **E** levels off.

1 .....

.....

2 .....

.....

3 .....

.....[3]

(c) Farmers often use chemicals to try to control an organism that is part of the food web, shown in Fig. 6.3.

(i) State which stage in the food web will be directly affected if a herbicide is used.

.....[1]

(ii) An insecticide, which is a type of pesticide, may be used. State which trophic level in this food web will accumulate the highest concentration of the insecticide.

.....[1]

(iii) Suggest what adverse effects could occur from the use of insecticides.

.....

.....

.....

.....[2]

[Total: 12]

[Turn over

7 **(a)** Describe the role of the liver in glucose metabolism and in fat digestion.

Glucose metabolism .....

.....

.....

.....

Fat digestion .....

.....

.....

.....[5]

(b) **(i)** State what is made into urea in the liver.

.....[1]

(ii) The table gives some details of some components of body fluids.

	blood in capillaries of kidney	liquid filtered from blood before reabsorption	urine
glucose	✔		
minerals	✔		
urea	✔		
water	✔		

Complete the table by showing with a tick (✔) which of the substances are present in the liquid filtered from the blood and in the urine. [2]

[Total: 8]

8 **(a)** Define *diffusion.*

.....

.....

.....[2]

(b) Fig. 8.1 shows an apparatus that was set up to investigate diffusion.

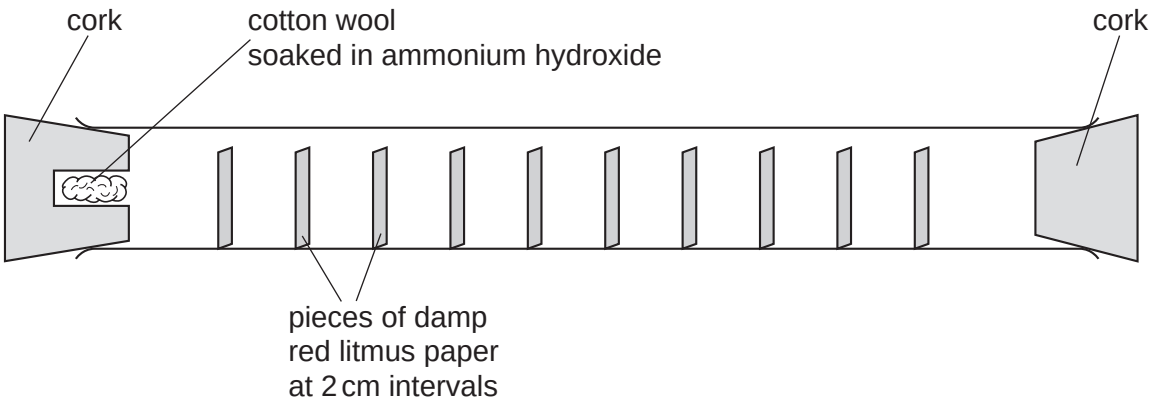


Fig. 8.1

Question 8 continues on page 14.

[Turn over

Fig. 8.2 shows the results for two samples of ammonium hydroxide that were investigated.

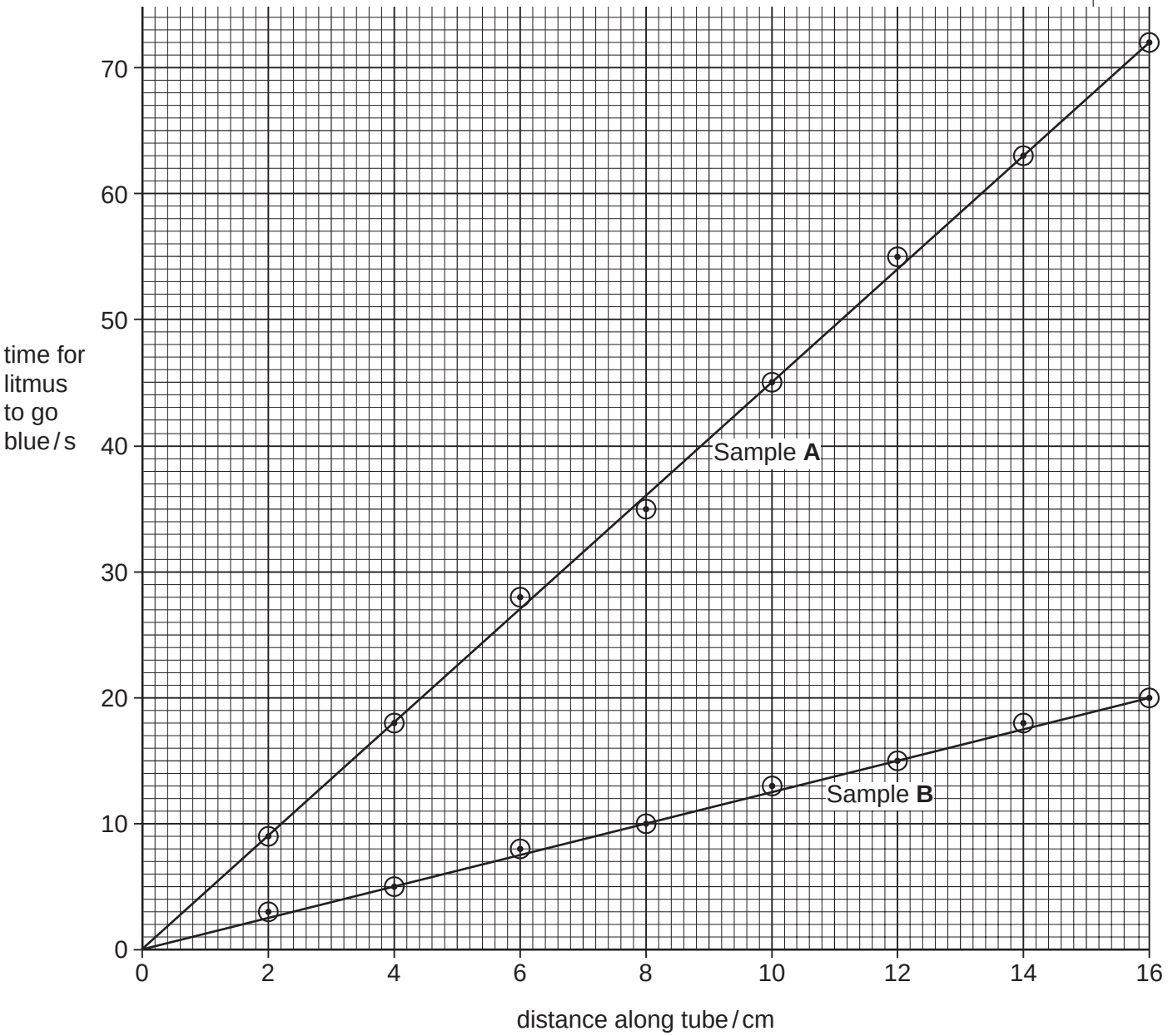


Fig. 8.2

Table 8.1 gives data for a third sample, **C**, of ammonium hydroxide that was investigated.

Table 8.1

distance of red litmus paper along tube / cm	time for red litmus paper to go blue / s
2	6
4	10
6	15
8	21
10	25
12	29
14	35
16	41

(i) Plot the data in Table 8.1 on Fig. 8.2. [3]

(ii) Suggest what has caused the litmus paper to go blue.

.....[1]

(iii) State which sample of ammonium hydroxide took longest to travel 10 cm along the tube.

.....[1]

(iv) What can you suggest about the concentration of sample **C**? Explain your answer.

.....

.....

.....[2]

(c) Fig. 8.3 shows an alveolus and an associated blood capillary.

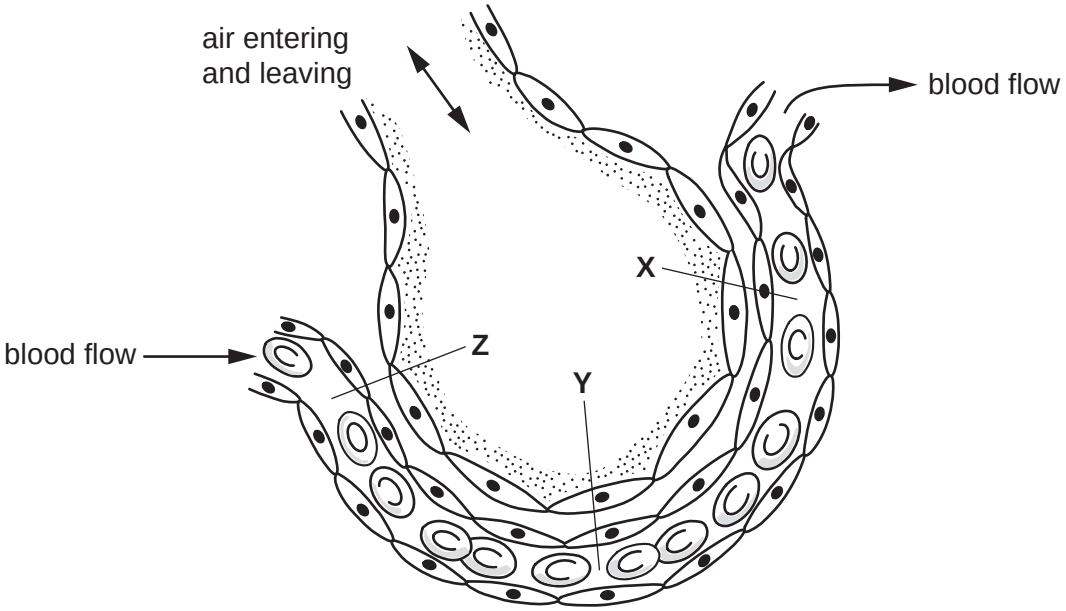


Fig. 8.3

(i) Suggest at which point, **X**, **Y** or **Z**, the rate of diffusion of carbon dioxide will be highest.

.....

.....[1]

(ii) The bronchi and bronchioles are lined with ciliated epithelium tissue and a thin layer of mucus. Describe the role of the cilia and mucus.

.....

.....

.....[2]

[Total: 12]