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|---------------|------------------|------|
| Centre Number | Candidate Number | Name |
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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

BIOLOGY

5090/02

Paper 2

October/November 2005

1 hour 45 minutes

Additional Materials: Answer Paper

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Section A

Answer **all** questions.
Write your answers in the spaces provided on the question paper.

Section B

Answer **all** the questions including questions 6, 7 and 8 **Either** or 8 **Or**.
Write your answers on the separate answer paper provided.

At the end of the examination,

1. fasten all your work securely together;
2. write an **E** (for Either) or an **O** (for Or) next to the number 8 in the grid below to indicate which question you have answered.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [] at the end of each question or part question.
You are advised to spend no longer than one hour on Section A and no longer than 45 minutes on Section B.

| FOR EXAMINER'S USE | |
|--------------------|---|
| Section A | |
| Section B | / |
| 6 | |
| 7 | |
| 8 | |
| TOTAL | |

This document consists of **12** printed pages.



Section A

Answer **all** questions.

Write your answers in the spaces provided.

- 1 Fig. 1.1 is a flow diagram which shows some of the stages in the manufacture of a type of cheese.

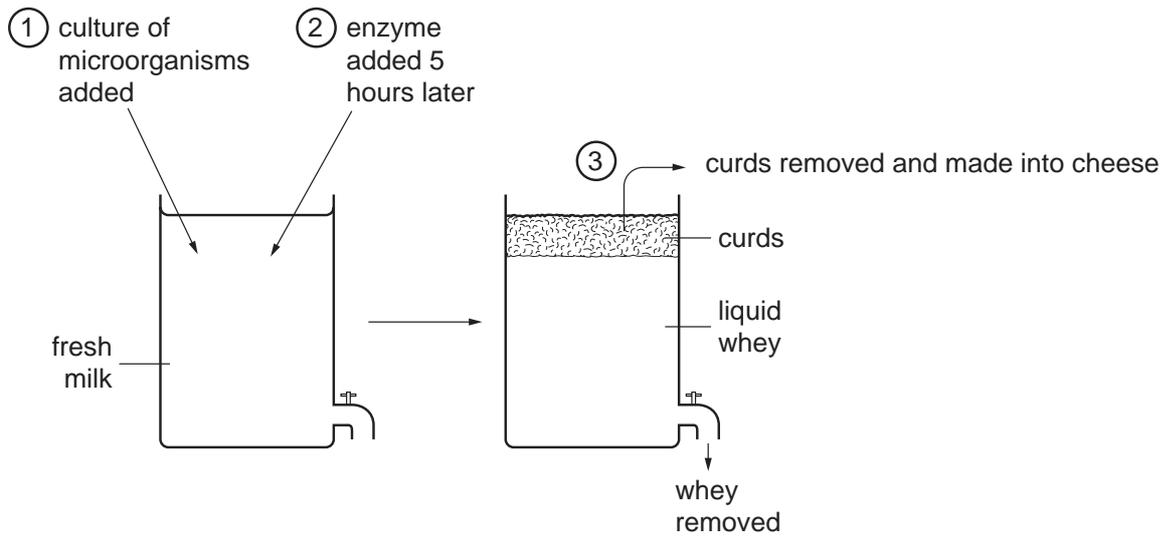


Fig. 1.1

Fig. 1.2 shows the changes in pH which occur during the first few hours of this process.

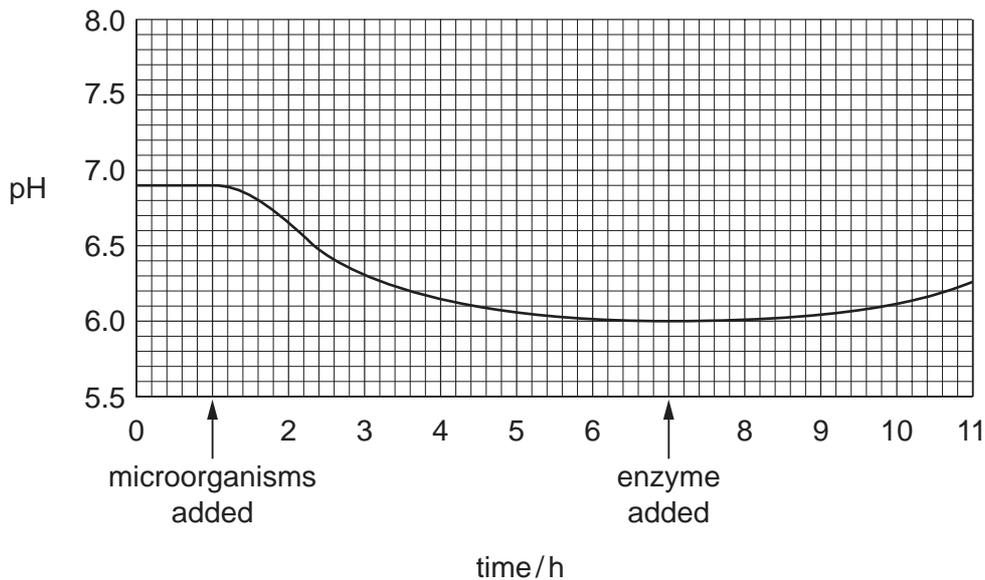


Fig. 1.2

- (a) Identify the type of microorganism added to the milk.[1]

(b) Use the information from Fig. 1.1 and Fig. 1.2 to describe the function of these microorganisms in this process.

.....

[3]

(c) The enzyme which curdles milk can be obtained from the alimentary canal of a young mammal. Suggest from which part of the alimentary canal the enzyme is obtained. State a reason for your answer.

part of alimentary canal

reason

.....[2]

(d) Fig. 1.3 shows how milk is treated **before** it is used to make a cheese-like product **P**. After this treatment, it undergoes a process similar to the one shown in Fig. 1.1. The end-product has a flavour and texture similar to cheese, but it is considered to be healthier to eat.

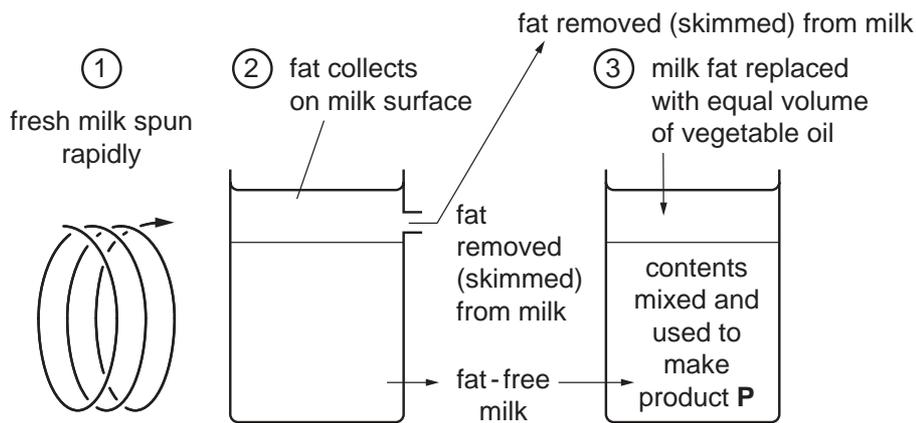


Fig. 1.3

(i) Suggest which feature of the manufacturing process in Fig. 1.3 may make product **P** healthier to eat than cheese.

.....[1]

(ii) State two possible harmful effects of eating cheese often and in large quantities.

1.

2.[2]

[Total: 9]

2 Fig. 2.1 shows the structures involved in oxygen uptake in the lungs.

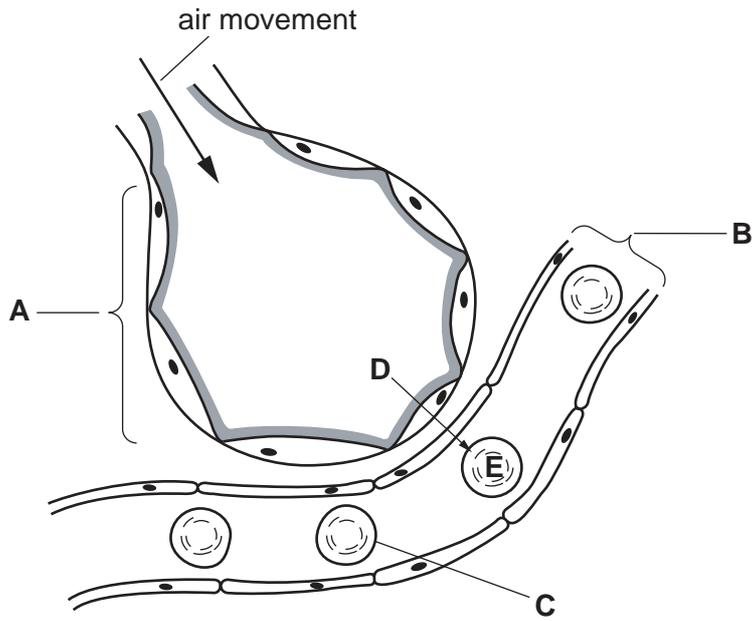


Fig. 2.1

(a) Identify structures **A**, **B** and **C** in Fig. 2.1.

A

B

C

[3]

(b) Each statement below describes a process that occurs during breathing.

Place a tick (✓) in the box beside each statement that describes a process necessary to cause air to move in the direction shown in Fig. 2.1.

- | | |
|--|---|
| | diaphragm relaxes |
| | (external) intercostal muscles contract |
| | ribs rise |
| | diaphragm rises |
| | volume of thorax decreases |

[2]

(c) Describe what happens to a molecule of oxygen as it moves from **D** to **E** in Fig. 2.1.

.....

.....

.....

.....[3]

- (d) Table 2.1 shows the percentage of oxygen in the inspired air and expired air of a healthy person.

Table 2.1

| % oxygen in inspired air | % oxygen in expired air |
|--------------------------|-------------------------|
| 20.5 | 16.5 |

Suggest and explain how these figures might be different for a person whose diet had been deficient in iron over a period of several years.

.....

.....

.....

.....[3]

[Total: 11]

3 Fig. 3.1 shows a tank containing animals and water plants.

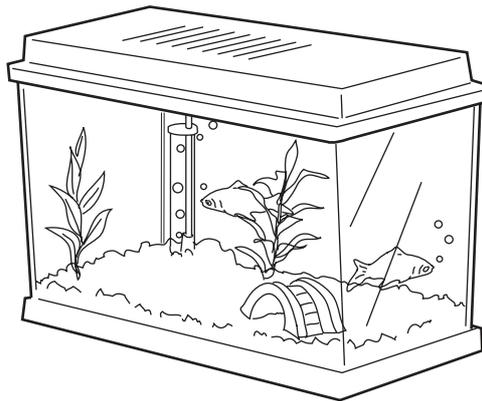


Fig. 3.1

(a) (i) Name the pigment responsible for the green colour of the plants.

..... [1]

(ii) Name the mineral ion which must be present for the manufacture of this pigment.

.....[1]

(b) (i) The animals supply the plants with a gas essential for the plants' food production.

Name the gas and the process for which it is used.

gas

process [2]

(ii) Suggest how the animals might benefit from the presence of these plants.

.....
.....
.....
.....
.....[4]

Fig. 3.2 shows a cell taken from one of the organisms in the tank.



Fig. 3.2

(c) From which type of organism was this cell taken? Explain your answer.

type of organism

explanation[1]

[Total: 9]

4 Fig. 4.1 shows a town and surrounding countryside.

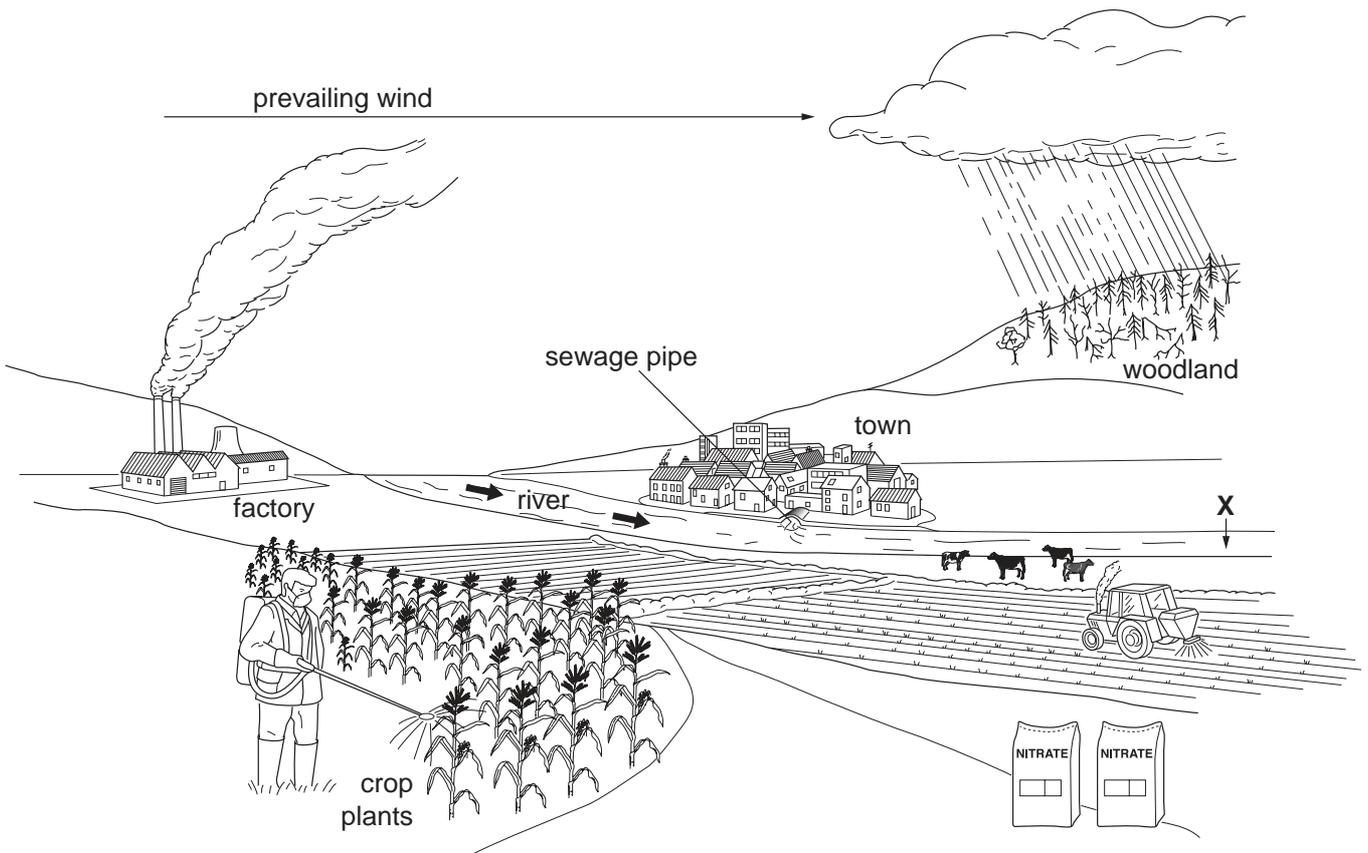


Fig. 4.1

(a) State the term for the effects on the environment of the activities shown in Fig. 4.1.

..... [1]

(b) (i) Name a harmful gas released into the air by the factory.

..... [1]

(ii) Describe a harmful effect of this gas.

.....
 [1]

(c) (i) Downstream from point **X** in Fig. 4.1, plants in the river grow rapidly and in large numbers.

State **two** possible reasons for this.

1.

2.[2]

(ii) Explain why, between the town and point **X**, there are large numbers of bacteria but very few plants and animals in the water.

.....

.....

.....

.....

.....[4]

[Total: 9]

5 Fig. 5.1 shows a section through the heart.

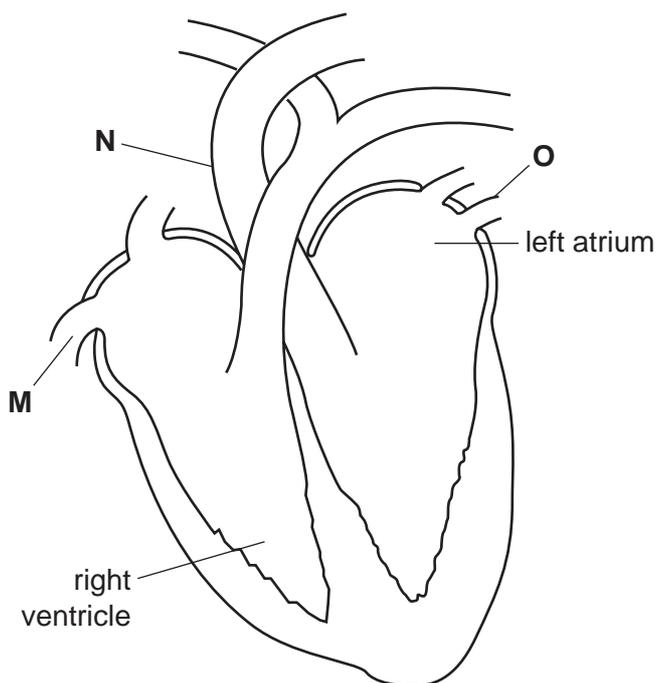


Fig. 5.1

(a) (i) Identify blood vessels **M**, **N** and **O** in Fig. 5.1.

M

N

O

[3]

(ii) Name the type of tissue which forms the major part of the heart and name the blood vessel which supplies this tissue with oxygen unless it is blocked by heart disease.

type of tissue

blood vessel

[2]

(b) On Fig. 5.1, draw, in the correct position, and label

(i) the semilunar valves,

(ii) the tricuspid valve,

(iii) the bicuspid (mitral) valve.

[4]

- (c) The four statements below describe some of the events that occur during the flow of blood through the heart. By placing the numbers **1** to **4** in the boxes, indicate the correct sequence of these events, starting immediately after deoxygenated blood has entered the heart and ending as the blood is sent to the lungs.

| | |
|----------------------|--------------------------------|
| <input type="text"/> | The right atrium contracts. |
| <input type="text"/> | The semilunar valves open. |
| <input type="text"/> | The right ventricle contracts. |
| <input type="text"/> | The tricuspid valve closes. |

[3]

[Total: 12]

Section B

Answer **three** questions.

Question **8** is in the form of an **Either / Or** question. Only one part should be answered.

Write your answers on the separate answer paper provided.

- 6** A person is sitting in the shade reading a book when he looks at the bright sky to see an aeroplane flying past. Explain the changes in
- (a) the lens of the eye, [6]
- (b) the pupil of the eye. [4]
- [Total: 10]
- 7** (a) Outline the process of reproduction in a human female from the moment of fertilisation to the time at which the placenta is formed. [4]
- (b) (i) State and explain the special dietary needs of a pregnant woman. [3]
- (ii) Describe the advantages of breast milk over bottled milk. [3]
- [Total: 10]

Answer only **Question 8 Either** or **Question 8 Or**.

- 8 Either** (a) Explain how a plant supports itself in the upright position. [4]
- (b) (i) Explain the process of wilting in a plant.
- (ii) Describe the conditions in which wilting is most likely to occur. [6]
- [Total: 10]
- 8 Or** (a) Explain the consequences of deforestation in terms of its effects on
- (i) soil stability,
- (ii) climate,
- (iii) local human populations. [8]
- (b) Explain how seeds are able to germinate in a soil lacking in nutrients. [2]
- [Total: 10]

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