Cambridge Assessment International Education

Predicted paper May/June 2025

Cambridge IGCSE™

CANDIDATE NAME: Solved by Anubha Roberts

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

BIOLOGY **0610**

Paper 4 Theory (Extended)

1 hour 15 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

For any further queries please contact on email below-

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1 Fig. 1.1 shows a diagram of human skin in hot weather.

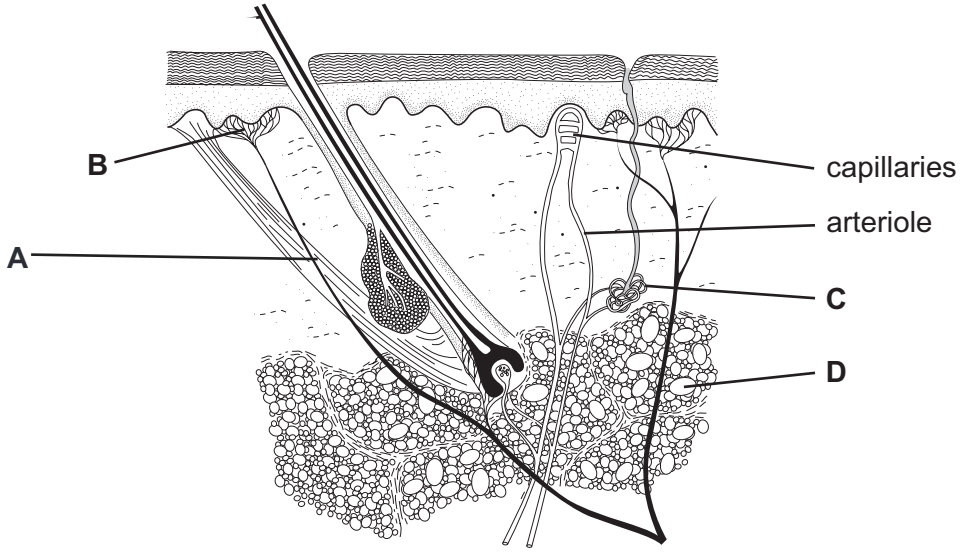

Fig. 1.1

(a) Name structures **A** to **D**.

A .....

B .....

C .....

D ..... [4]

(b) Describe how the structures (**A** to **D**) in the skin help to maintain a constant body temperature. You may refer to the structures by their letters.

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..... [4]

(c) **(i)** Blood flow through the skin changes in response to changes in the air temperature.

State **and** explain what happens to blood flow through the skin when the temperature of the surrounding air becomes very cold.

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(ii) Explain how the changes you have described in **(c)(i)** reduce heat loss.

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..... [5]

(d) The control of blood glucose is an example of negative feedback.

Explain how negative feedback controls the blood glucose concentration of a person who has **not** eaten for a day.

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..... [3]

[Total: 16]

2 Fig. shows a fetus in the uterus immediately before birth.

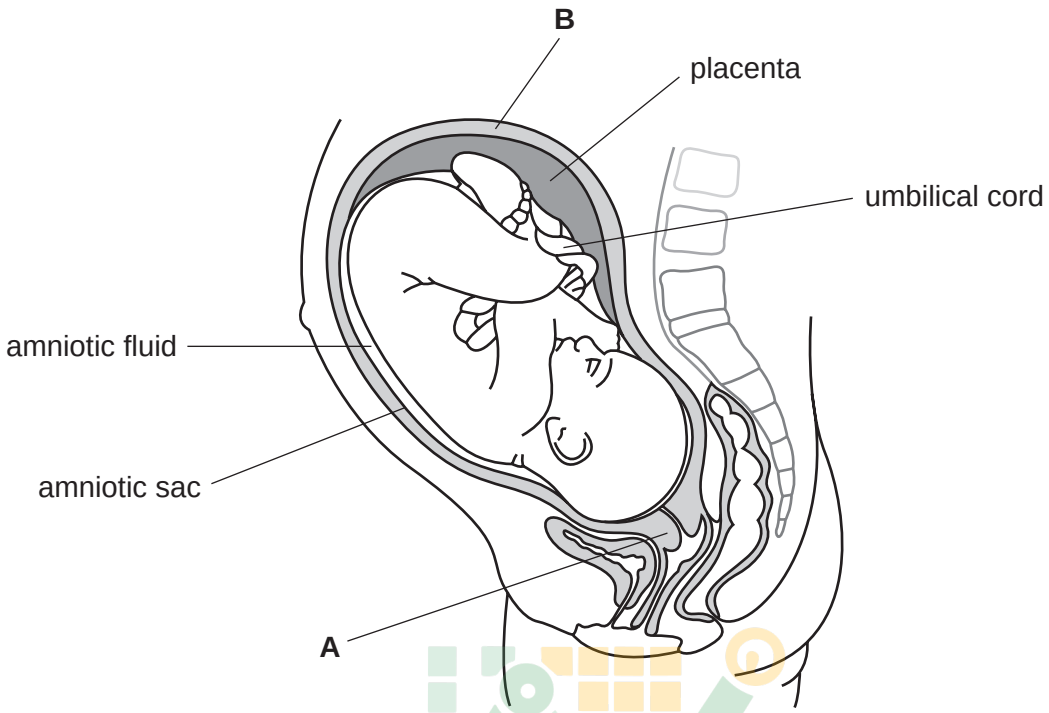

Fig.

(a) Describe the functions of the amniotic sac and amniotic fluid.

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..... [4]

(b) List three functions of the placenta.

1. .....

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2. .....

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3. .....

..... [3]

(c) Discuss two of the advantages of breast-feeding.

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..... [2]

(d) Outline the events that happen after insemination till implantation.

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[Total: 13]

3 Penicillin is an antibiotic produced by the fungus *Penicillium chrysogenum*.

Fig. 4.1 shows the process used to produce penicillin.

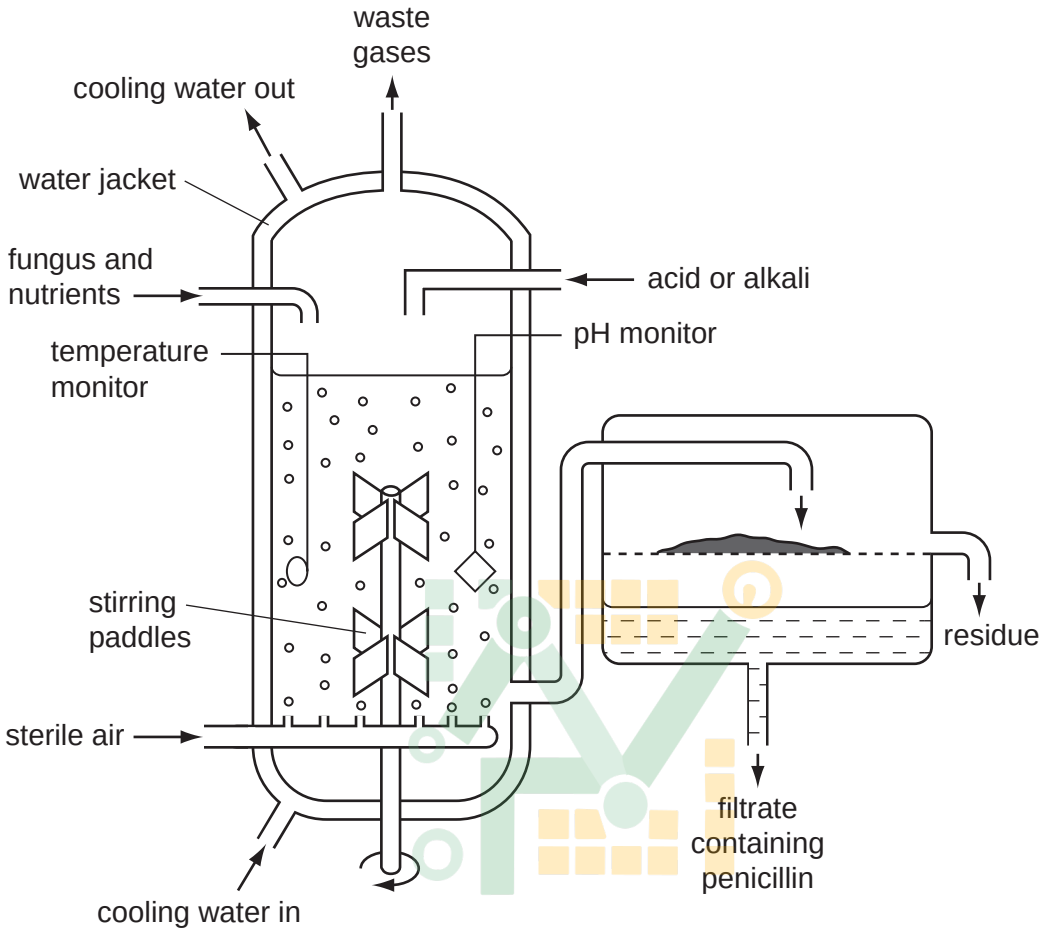

Fig. 4.1

(a) Enzymes in the fungus are used to make penicillin.

Explain why there is a water jacket around the fermenter and nutrients are added to the fermenter.

water jacket

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Nutrients

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..... [6]

Fig. 4.2 shows the mass of fungus and the yield of penicillin during the process.

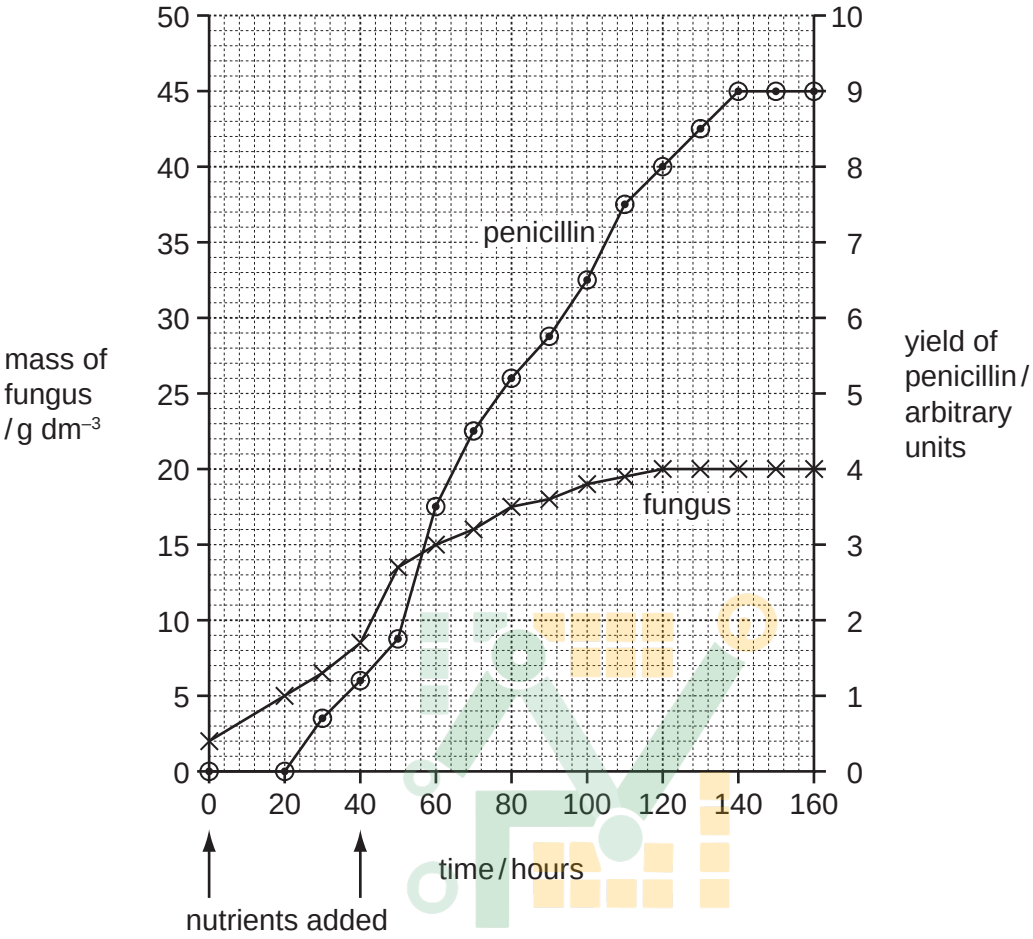

Fig. 4.2

(b) (i) State the time interval over which the fungus grew at the maximum rate.

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[1]

(ii) As the fungus grows in the fermenter, the nuclei in the fungal hyphae divide.

State the type of nuclear division that occurs during the growth of the fungus in the fermenter.

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[1]

(iii) Explain why the growth of the fungus slows down and stops.

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..... [3]

[Total: 11]

4 Fig. 4.1 is a diagram of *Vibrio cholerae*, the bacterium that causes cholera.

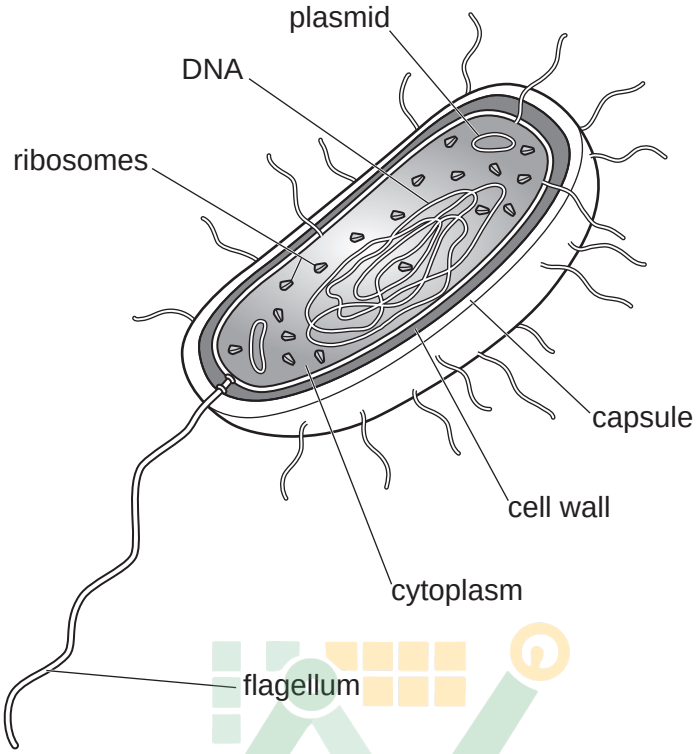

Fig. 4.1

(a) Explain how the cholera bacterium causes diarrhoea.

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..... [3]

(b) A scientist tested the resistance of one strain of bacteria to different antibiotics.

The scientist tested solutions of five different antibiotics, **A** to **E**.

She soaked a paper disc in each antibiotic solution.

The paper discs with antibiotics were placed in a Petri dish containing bacteria on agar jelly.

Fig. 4.2 is a diagram of the appearance of the Petri dish after 48 hours. The shaded areas show where bacteria grew. The clear areas show where bacteria did **not** grow.

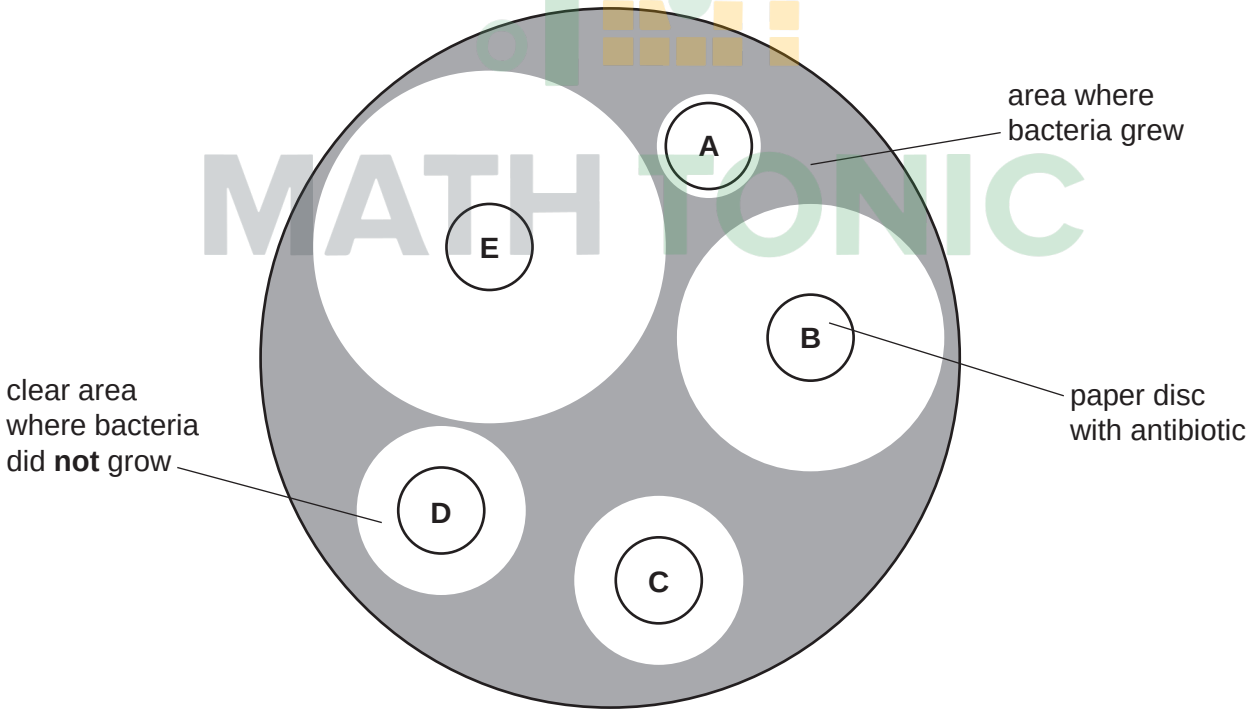

Fig. 4.2

(i) The strain of bacteria used in this investigation causes a disease.

Using the information in Fig. 4.2, explain why antibiotic **E** would be the most effective at treating this disease.

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..... [1]

(ii) The results in Fig. 4.2 show that this strain of bacteria is resistant to antibiotic **A**.

Five years ago, a similar investigation found that the clear area for antibiotic **A** was the same size as antibiotic **B** is in Fig. 4.2.

Explain how bacteria become resistant to antibiotics.

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(iii) Describe how to minimise the risk of antibiotic **B** developing the same results as antibiotic **A**.

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[Total: 11]

5 (a) A student investigated the effect of different concentrations of sodium chloride solution on osmosis in potatoes.

The student's results are shown in Table 1.1.

Table 1.1

concentration of sodium chloride solution /mol per dm^3	potato cylinder initial mass/g	potato cylinder final mass/g	percentage change in mass
0.0	1.13	1.32	16.8
0.2	1.03	1.08	4.9
0.4	1.19	1.06	–10.9
0.6	1.13	0.86	–23.9
0.8	1.14	0.82	

(i) Using the information in Table 1.1, calculate the percentage change in mass for the potato cylinder in the 0.8 mol per dm^3 sodium chloride solution.

Give your answer to **one** decimal place.

Space for working.

..... %

[3]

(ii) Using the information in table, explain why the difference in loss was greater in 0.8 $mol\,dm^{-3}$ sodium cloride solutions.

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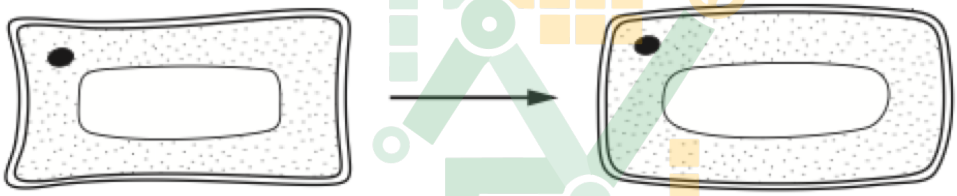
..... [3]

(b) The diagram below shows the expected appearance of cell after it is immersed in distilled water for 30 minutes.



Outline three differences that will take place in the cell after 30 minutes of immersion in distilled water.

1. .....
2. .....
3. ..... [3]

(c) Describe how the process of active transport differs from diffusion.

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..... [3]

[Total: 12]

6 The ribcage and diaphragm are involved in the breathing mechanism to ventilate the lungs.

Fig. 3.1 is a flow chart that shows the changes that take place when breathing in.

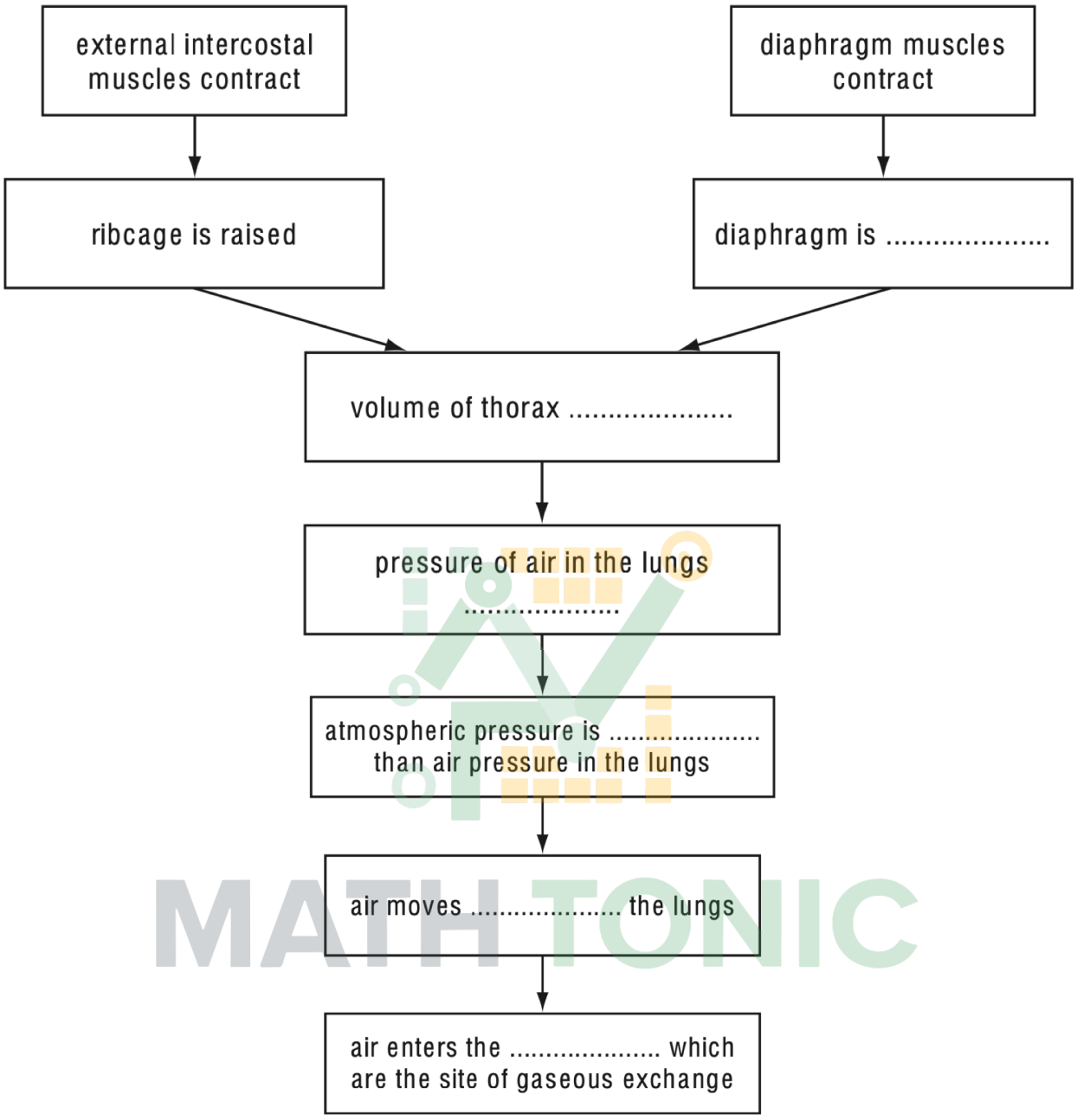

Fig. 3.1

(a) Complete Fig. 3.1 by writing appropriate words in the spaces provided. [6]

[Total: 6]

7 Marine conservationists are concerned that fish stocks in the sea are decreasing. Drastic measures will have to be taken to stop the extinction of many fish species.

Fig. 5.1 shows a marine food web. Tuna are large carnivorous fish that are an important human food. Dolphins may be caught in fishermen's nets and die.

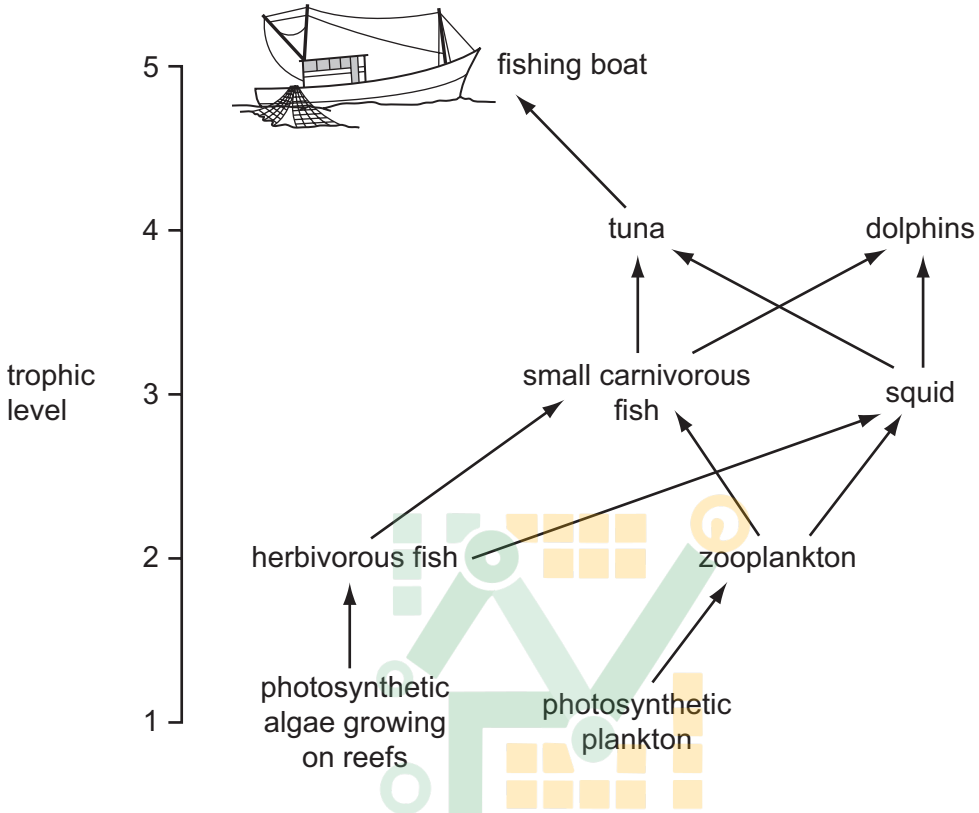

Fig. 5.1

(a) State the names given to trophic levels **1** and **3**.

1 .....

3 ..... [2]

(b) Explain why it is more energy efficient for humans to eat herbivorous fish rather than tuna.

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(c) Explain why it is necessary to conserve animals, such as tuna and dolphins, which are at trophic level 4.

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..... [4]

(d) Many seas are polluted by non-biodegradable plastics.

Suggest the likely effects of this pollutant on the marine environment.

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..... [4]

[Total: 13]