



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

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BIOLOGY

0610/22

Paper 2 Core

May/June 2010

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 on all the work you hand in.

Write in dark blue or black pen.

You may use a pencil for any diagrams or graphs.

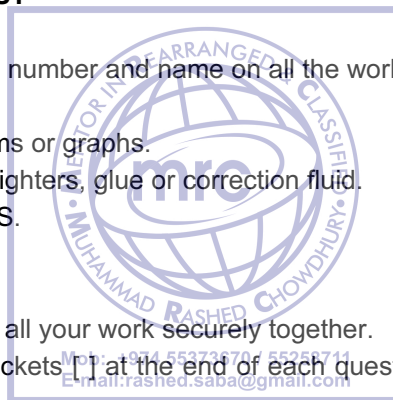
Do not use staples, paper clips, highlighters, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

At the end of the examination, fasten all your work securely together.

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



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| | |
|--------------|--|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| Total | |

This document consists of **15** printed pages and **1** blank page.



1 Fig.1.1 shows the shells of five molluscs.

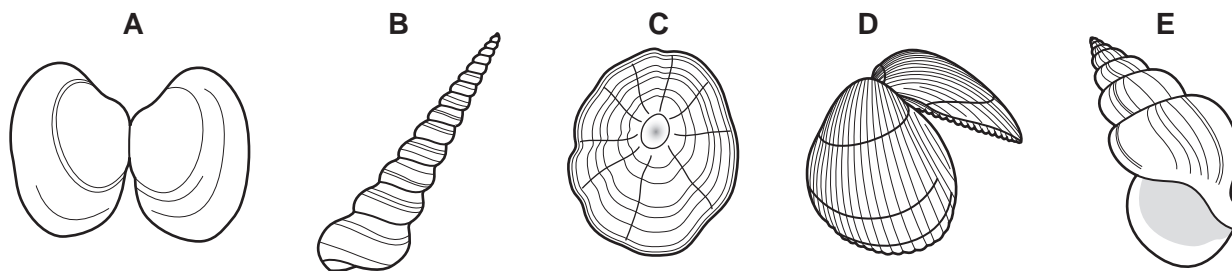


Fig.1.1

Use the key to identify each of the molluscs which normally live inside the shells. Write the name of each mollusc in the correct box of Table 1.1.

As you work through the key, tick (✓) the boxes in Table 1.1 to show how you identified each mollusc.

Key

| | | name of mollusc |
|-------|--|-------------------|
| 1 (a) | Shell made of two parts | go to 2 |
| 1 (b) | Shell made of one part only | go to 3 |
| 2 (a) | Both shell halves have ridges running down the shell | <i>Cardium</i> |
| 2 (b) | Both shell halves are smooth | <i>Venerupis</i> |
| 3 (a) | Shell tightly coiled | go to 4 |
| 3 (b) | Shell conical with no coil | <i>Patella</i> |
| 4 (a) | Bottom coil less than a quarter of the length of the shell | <i>Turritella</i> |
| 4 (b) | Bottom coil more than half of the length of the shell | <i>Buccinum</i> |

Table 1.1

| | 1 (a) | 1 (b) | 2 (a) | 2 (b) | 3 (a) | 3 (b) | 4 (a) | 4 (b) | name of mollusc |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|
| A | | | | | | | | | |
| B | | | | | | | | | |
| C | | | | | | | | | |
| D | | | | | | | | | |
| E | | | | | | | | | |

[4]

[Total: 4]

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2 (a) Humans need a supply of mineral salts, such as calcium and iron, in their diet.

(i) State a role of calcium ions in the human body.

..... [1]

(ii) State a role of iron ions in the human body.

..... [1]

(b) Fertilisers are used by farmers to increase the growth of crop plants.

The fertilisers contain a mixture of mineral salts.

(i) State a use of magnesium ions in a plant.

..... [1]

(ii) State a use of nitrate ions in a plant.

..... [1]

(c) A factory that produces fertilisers is located next to a small river. At the end of each week its machinery is washed out and the contaminated water is released into the river.

Suggest what effects this action could have on the plants and animals living in the river.

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

[Total: 8]



- 3 A species of plant has white-flowered plants and blue-flowered plants.

If a homozygous white-flowered plant was crossed with a blue-flowered plant, all the seeds produced plants with only blue flowers.

- (a) State which flower colour is controlled by the dominant allele and explain your reason for this answer.

.....
 [1]

- (b) Use the symbols, **B** and **b**, to represent the two alleles for flower colours.

- (i) State the genotype of each parent plant.

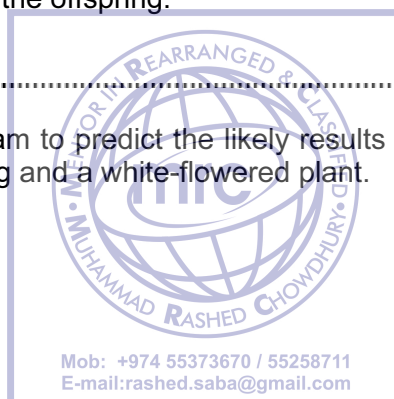
blue-flowered plant

white-flowered plant [2]

- (ii) State the genotype of the offspring.

..... [1]

- (iii) Draw a genetic diagram to predict the likely results of a cross between one of the blue-flowered offspring and a white-flowered plant.



[4]

Question 3 continues on Page 6



(c) Fig. 3.1 shows a cob of a maize plant.

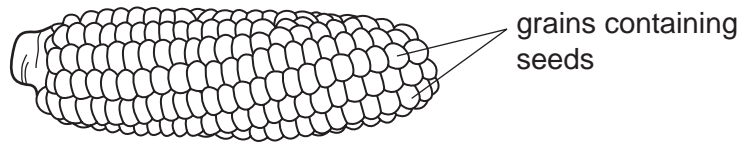


Fig. 3.1

Fig. 3.2 shows the length of the cobs formed by a number of different maize plants.

All the plants were grown from seeds from one original cob.

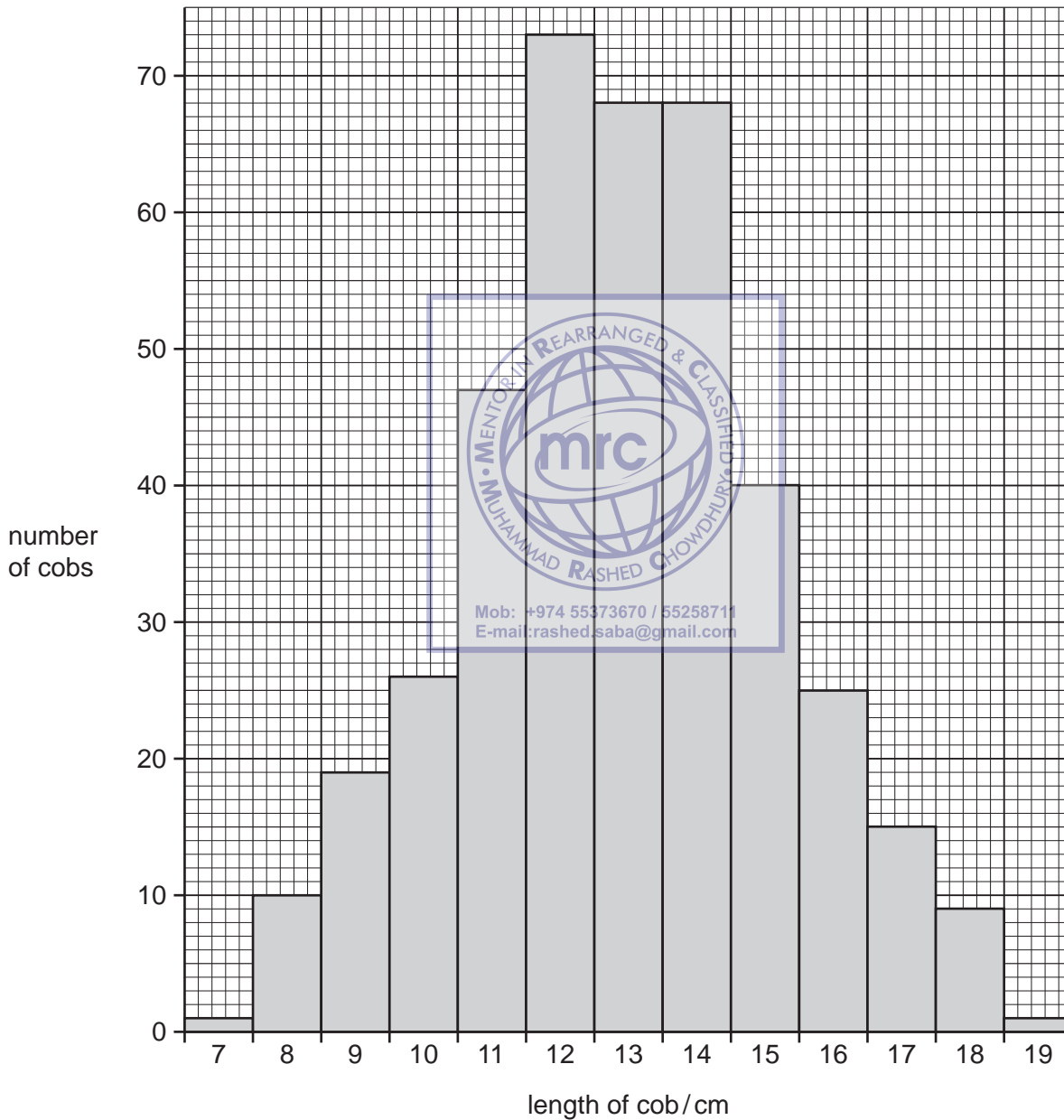


Fig. 3.2

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(i) Explain the evidence visible in Fig. 3.2, that shows that this is continuous variation.

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

(ii) Suggest three environmental factors that might affect the length of the maize cobs.

1.
2.
3. [3]

(iii) Explain how the type of variation shown by the maize cobs differs from that shown by the blue and white flowers.

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

[Total 13]



4 In the Arctic, snowy owls are predators of lemmings. The lemmings eat arctic plants.

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(a) Draw the food chain for this arctic ecosystem.

..... [1]

(b) Fig. 4.1 shows changes in the populations of snowy owls and lemmings over a three year period.

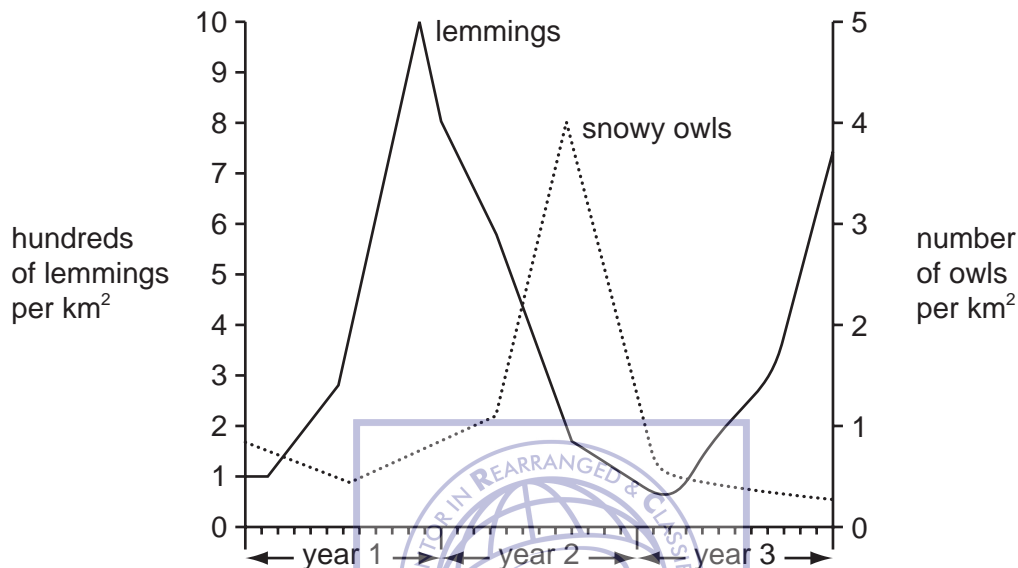


Fig. 4.1

(i) During the first 10 months of year 1 the lemming population increases slowly at first and then more rapidly. Suggest why the rate of increase becomes greater.

..... [1]

(ii) Using information in Fig. 4.1, suggest why the lemming population falls during year 2.

..... [2]

(iii) Using information in Fig. 4.1, describe and explain how changes in the lemming population affect the snowy owl population.

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.....
.....
.....
.....
..... [3]

(iv) If all the snowy owls were removed from the arctic ecosystem, suggest and explain what effect this would have on the lemming population in the following years.

.....
.....
.....
.....
..... [3]

(c) Lemmings and snowy owls get their energy from the food they eat.

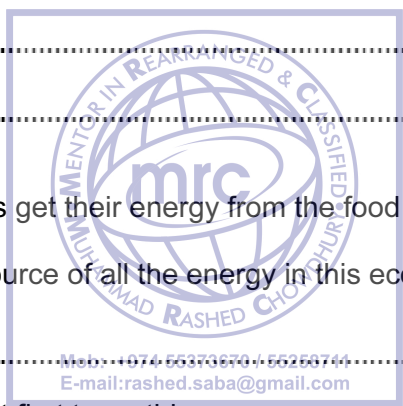
(i) What is the original source of all the energy in this ecosystem?

..... [1]

(ii) Name the process that first traps this energy.

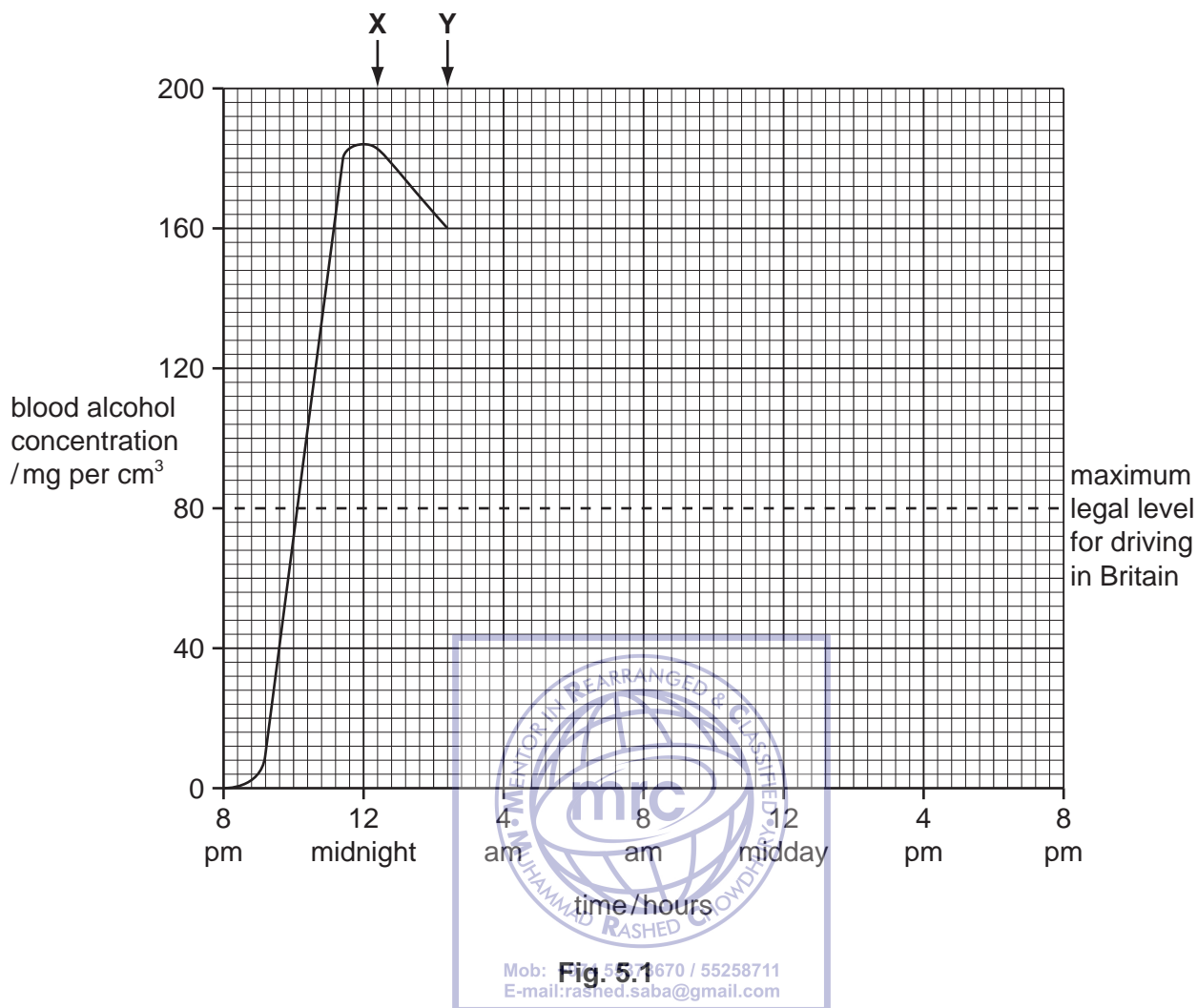
..... [1]

[Total 12]



5 (a) Fig. 5.1 shows the concentration of alcohol in the blood of a person over a number of hours. During this time the person had several alcoholic drinks while eating a meal.

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In Britain it is illegal for a person to drive a vehicle with more than 80 mg of alcohol per cm^3 of blood.

(i) What is the highest concentration of alcohol in the person's blood?

..... mg of alcohol per cm^3 of blood. [1]

(ii) The alcohol in the blood is steadily broken down.
Name the organ of the body that breaks down alcohol.

..... [1]

(iii) The alcohol continues to be broken down at the same rate as between X and Y.
Complete the graph, by extending the line, until there is no alcohol in the person's blood. [1]

(iv) Use the graph to predict when the person would be able to legally drive a vehicle again.

..... [1]

(b) (i) Alcohol is a depressant drug.
Explain how this could affect the ability of a person to drive a vehicle.

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

(ii) State a long-term effect alcohol can have on two named organs.

organ 1

effect

organ 2

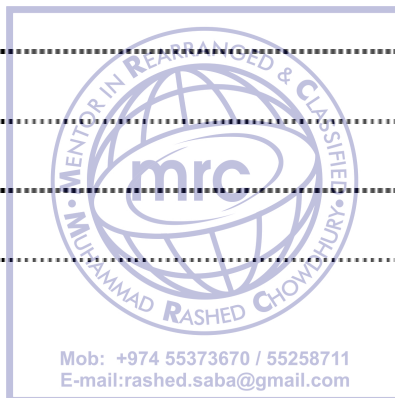
effect [2]

(iii) Describe two social problems that can happen if a person becomes addicted to alcohol.

1.
.....

2.
..... [2]

[Total: 10]



6 (a) Define *asexual reproduction*.

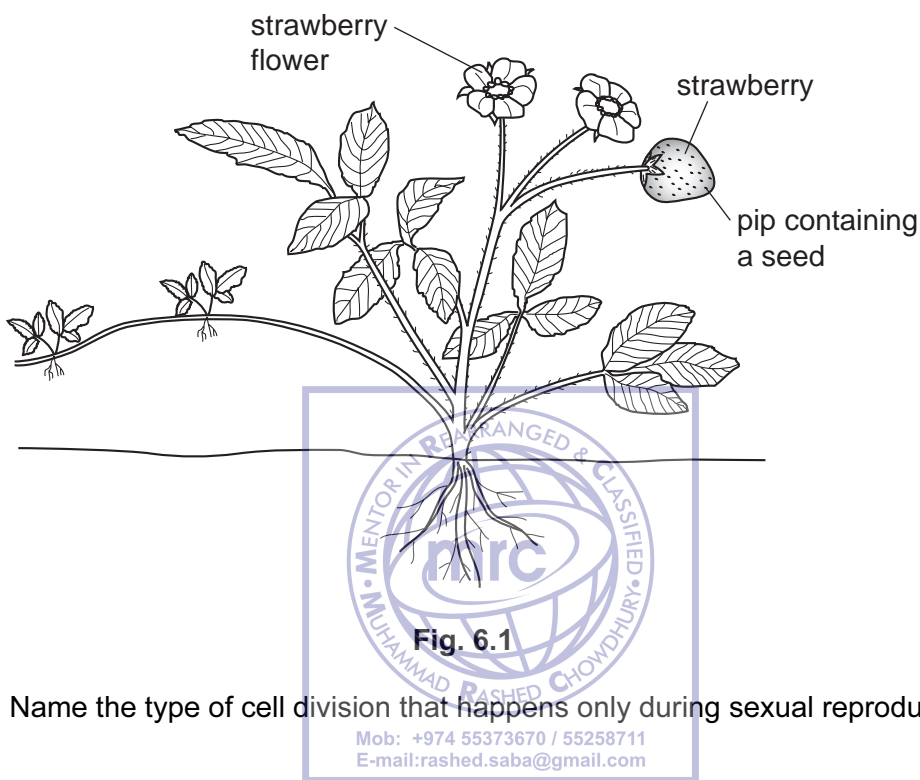
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.....

.....

..... [2]

(b) Fig. 6.1 shows a strawberry plant that can reproduce both asexually and sexually.



(i) Name the type of cell division that happens only during sexual reproduction.

..... [1]

(ii) A farmer decided to increase the number of strawberry plants by asexual rather than sexual reproduction.

Suggest a biological reason why the farmer may have decided this.

.....

..... [1]

(c) The strawberry flower has five large, white petals. Explain the importance of these petals in the process of reproduction.

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.....
.....
.....
..... [3]

(d) Seeds are often found inside brightly coloured, fleshy fruits. Describe the advantage of fruits being coloured and fleshy.

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

[Total: 9]



7 (a) (i) Name the term that is used to describe the maintenance of a constant internal environment.

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..... [1]

(ii) State two advantages to a mammal of maintaining a constant body temperature.

1.

.....

2.

..... [2]

(b) Fig. 7.1 shows changes in a person's body temperature before, during and after a period of exercise.

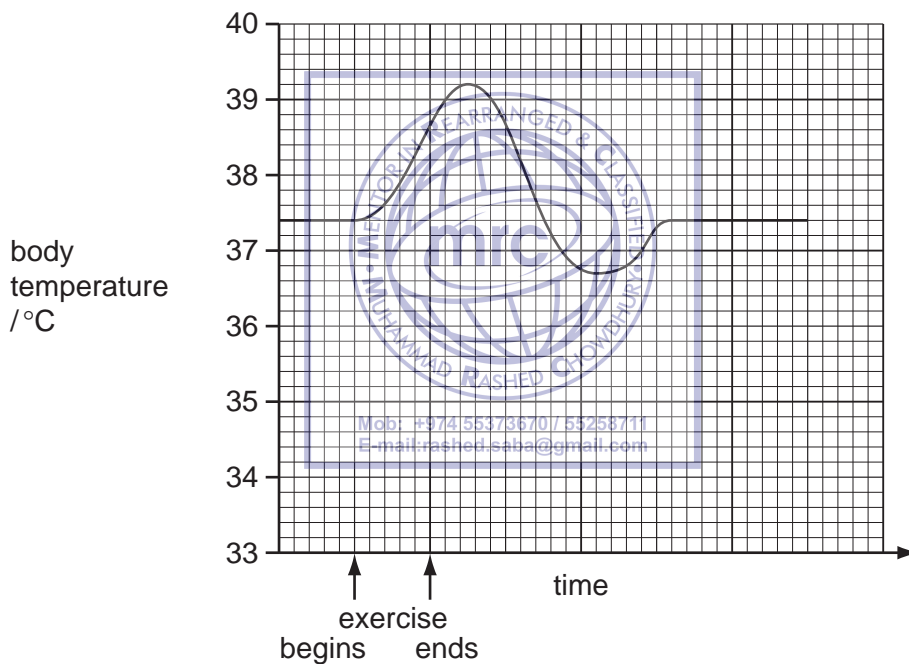


Fig. 7.1

(i) Using information from Fig. 7.1, state the normal body temperature of this person.

..... °C. [1]

(ii) Explain what is meant by the term *vasodilation*.

.....

..... [1]

(iii) On Fig. 7.1, label with an **X** a point when vasodilation is having an effect on the person's body temperature. [1]

- 9 (a) The air which is inhaled is different from that which is exhaled.

Complete the following sentences about these differences.

- (i) Inhaled air has more than exhaled air. [1]
- (ii) Exhaled air has more and
than inhaled air. [2]
- (iii) Inhaled air usually has a temperature than exhaled air [1]

- (b) One of the gases present in inhaled and exhaled air is carbon dioxide.

Describe how you could test exhaled air for carbon dioxide and describe the result if carbon dioxide is present.

test

.....

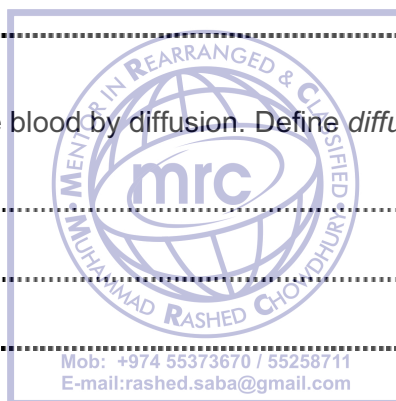
result [2]

- (c) Gases enter and leave the blood by diffusion. Define *diffusion*.

.....

.....

..... [2]



[Total: 8]

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