Specimen Paper

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	

AQA Level 1/2 Certificate in Science: Double Award Specimen Paper

Double Award

Biology Paper 1F

For this paper you must have:
- a ruler.

You may use a calculator.

Time allowed
- 60 minutes

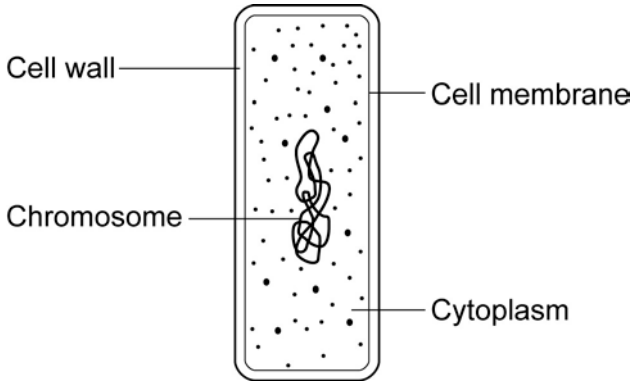
Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

Advice
- In all calculations, show clearly how you work out your answer.

Answer **all** questions in the spaces provided.

1 The drawing shows the cell of a bacterium.



1 (a) **List A** gives the four structures labelled on the diagram.

List B includes information about each structure.

Draw **one** line from each structure in **List A** to the correct information about the structure in **List B**.

List A **Structure**	**List B** **Information**
Cell membrane	controls the passage of substances in and out of the cell
Cell wall	where most of the chemical reactions take place
Cytoplasm	strengthens the cell
Chromosome	where there are genes
	helps the bacterium to photosynthesise

(4 marks)

1 (b) Give **two** differences between an animal cell and the cell of a bacterium.

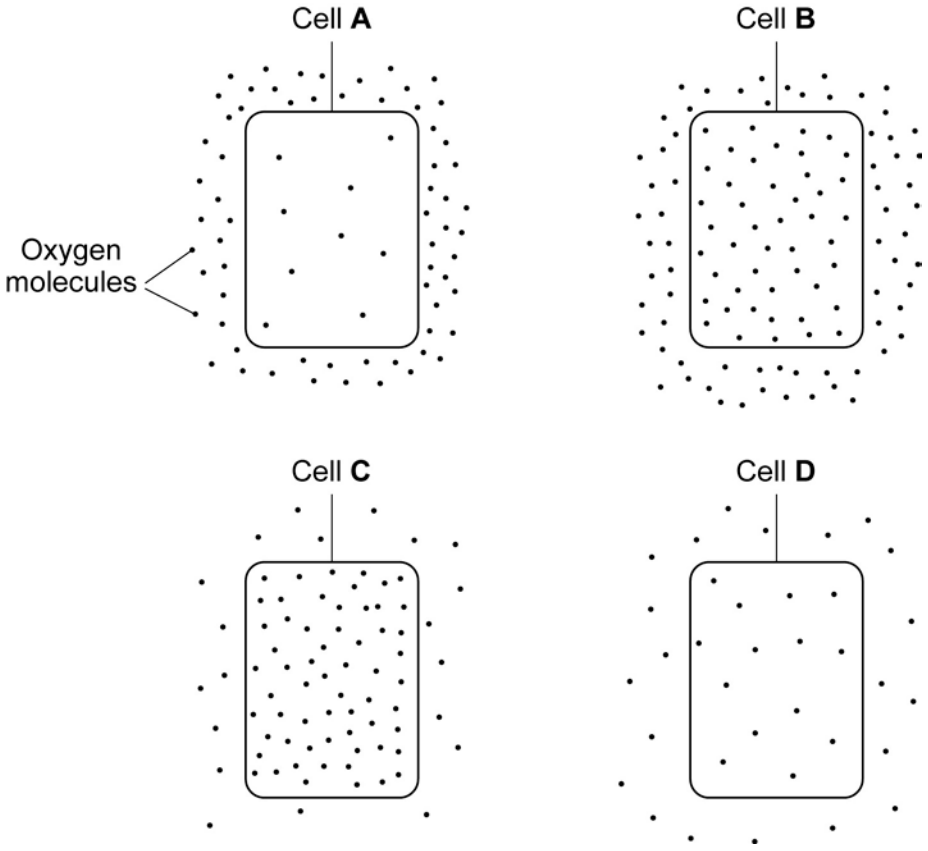
1 .....

2 .....

(2 marks)

1 (c) The diagrams show cells containing and surrounded by oxygen molecules.

Oxygen can move into cells or out of cells.



Into which cell, **A**, **B**, **C** or **D**, will oxygen move the fastest?

Write the correct letter, **A**, **B**, **C** or **D**, in the box. ☐

Give the reason for your answer.

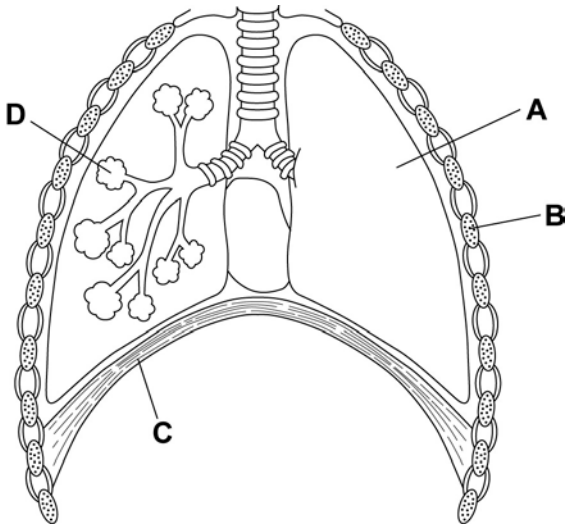
.....

(2 marks)

8

Turn over for the next question

2 The diagram shows a section through the chest.



For each question write the correct letter in the box.

Which structure, **A**, **B**, **C** or **D**, is:

2 (a) a rib ☐

(1 mark)

2 (b) the diaphragm ☐

(1 mark)

2 (c) an alveolus? ☐

(1 mark)

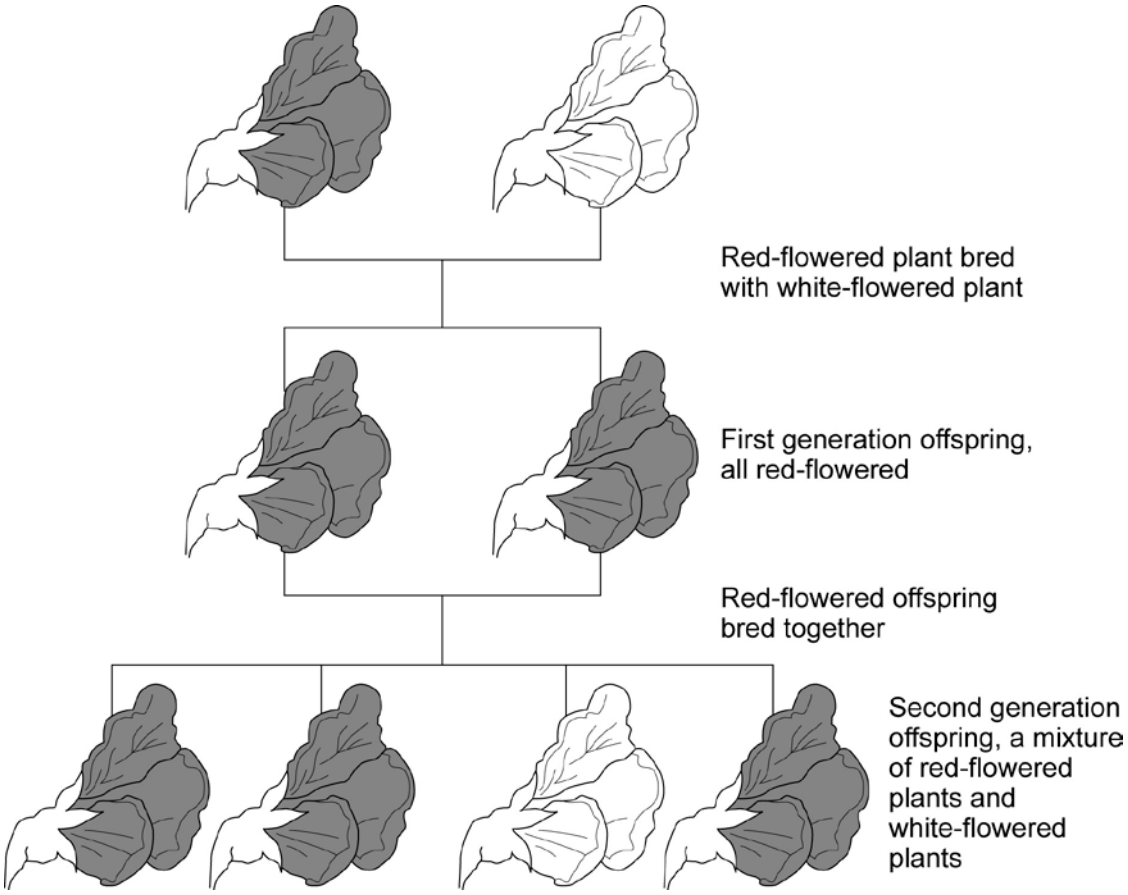
2 (d) Complete the sentence.

Alveoli are adapted for absorbing ....

(1 mark)

4

3 The diagrams show one of Mendel's experiments.
He bred pea plants.



Mendel suggested that flower colour was controlled by inherited factors.

Draw a ring around the correct answer to complete the following sentences.

3 (a) The first generation plants show that the red factor is

dominant.

environmental.

recessive.

(1 mark)

3 (b) The second generation plants show that the white factor is

dominant.

environmental.

recessive.

(1 mark)

Question 3 continues on the next page

Turn over ▶

3 (c) What do we call inherited factors?

.....

(1 mark)

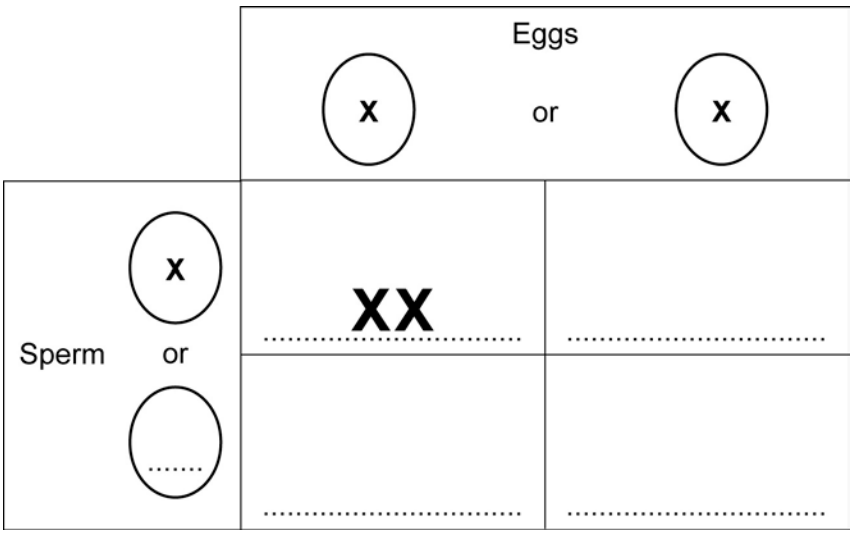
3 (d) How are inherited factors passed from generation to generation?

.....

(1 mark)

In humans, sex chromosomes control whether a person is male or female.

3 (e) Use letters **X** and **Y** to complete the Punnett square for sex inheritance.



(3 marks)

3 (f) A couple already have three boys.

What is the probability that their next child will be a girl?

.....

.....

(1 mark)

8

4 Hormones control growth in plants.

4 (a) Give **two** uses of plant growth hormones in horticulture.

1 .....

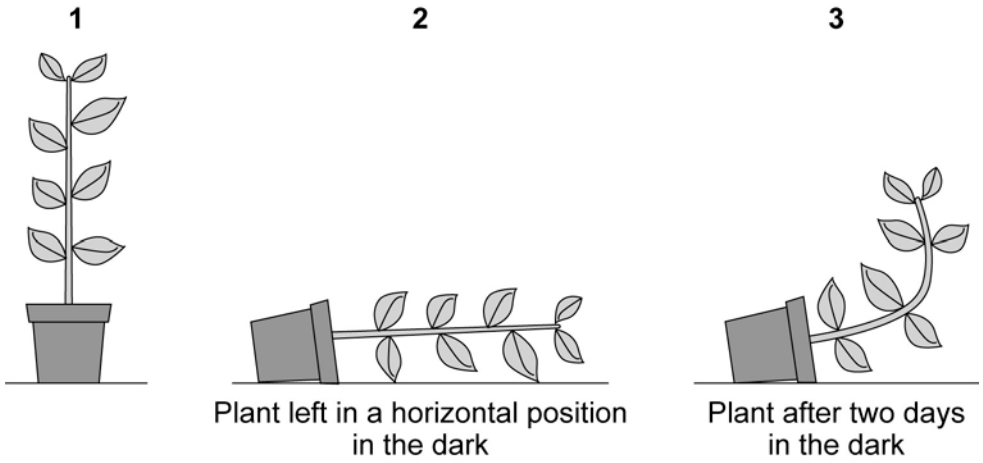
2 .....

(2 marks)

4 (b) A student grew a plant in an upright pot.

Later she put the pot in a horizontal position and left the plant in the dark for two days.

Diagram 3 shows the potted plant after two days in the dark.



Explain fully why the plant responded in this way.

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(4 marks)

6

Turn over ▶

5 A doctor collected data about the number of deaths in the two maternity wards in the hospital where he worked.

- From 1833 to 1838 there were the same number of doctors and midwives delivering babies in both **Ward 1** and **Ward 2**.
- From 1839 to 1847 medical students and doctors delivered babies in **Ward 1**; midwives delivered babies in **Ward 2**.

The doctor also noticed that doctors often came straight from examining dead bodies to the delivery ward.

The table shows the number of patients and the number of deaths in the two wards.

Years	Ward	Number of patients	Number of deaths	Death rate as deaths per 1000 patients
1833–1838	Ward 1	23 509	1505	64.0
	Ward 2	13 097	731	55.8
1839–1847	Ward 1	20 204	1989	98.4
	Ward 2	17 791	691	

5 (a) (i) Use the formula

$$\textbf{death rate} = \frac{\textbf{number of deaths x 1000}}{\textbf{number of patients}}$$

to calculate the death rate for **Ward 2** in the years 1839–1847.

.....

.....

Death rate = ... deaths per 1000 patients

(2 marks)

5 (a) (ii) Suggest a hypothesis for the difference in the death rates on **Ward 1** and **Ward 2** in the years 1839–1847.

.....

.....

.....

.....

(2 marks)

5 (b) Antibiotics are now used in hospitals.

What is an antibiotic, and what does it do?

.....

.....

.....

(2 marks)

5 (c) MRSA is a new strain of pathogen which is causing problems in hospitals.

5 (c) (i) What process leads to new strains of pathogens being produced?

.....

.....

(1 mark)

5 (c) (ii) Why is MRSA causing problems in hospitals?

.....

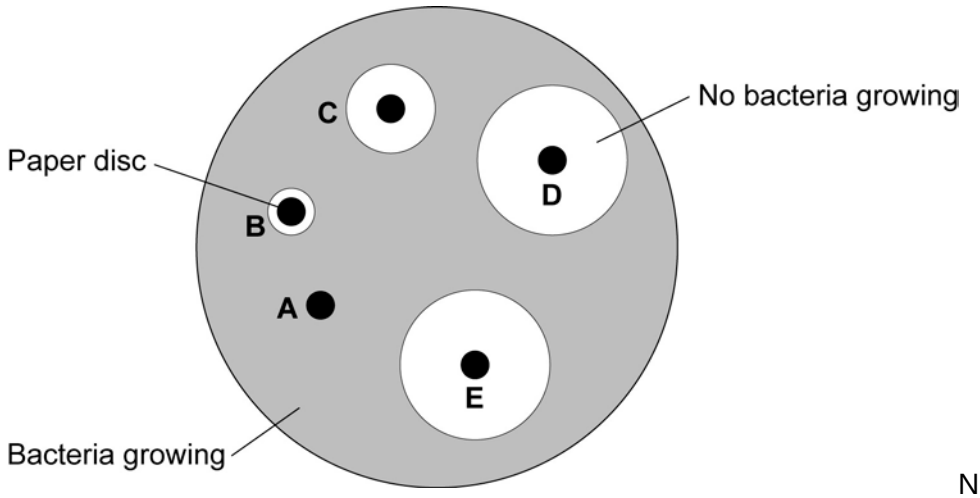
.....

(1 mark)

Question 5 continues on the next page

5 (d) An investigator placed paper discs containing different concentrations of an antibiotic onto a culture of bacteria in a Petri dish.

After an incubation period of two days, the dish looked like this.



NB: Not to scale

5 (d) (i) Explain why there are areas around some of the paper discs where no bacteria are growing.

.....

.....

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(2 marks)

5 (d) (ii) The results of the investigation are given in the table.

The table shows the concentration of the antibiotic on the paper discs and the diameter of the circles where no bacteria are growing.

Disc	Concentration of the antibiotic in units	Diameter of circle where no bacteria are growing in mm
A	0	0
B	2	8
C	4	14
D	6	26
E	10	26

Why did the investigator include Disc **A**?

.....

.....

(1 mark)

5 (d) (iii) Use the table to describe the effect of an increase in the concentration of the antibiotic on the growth of the bacteria.

.....

.....

.....

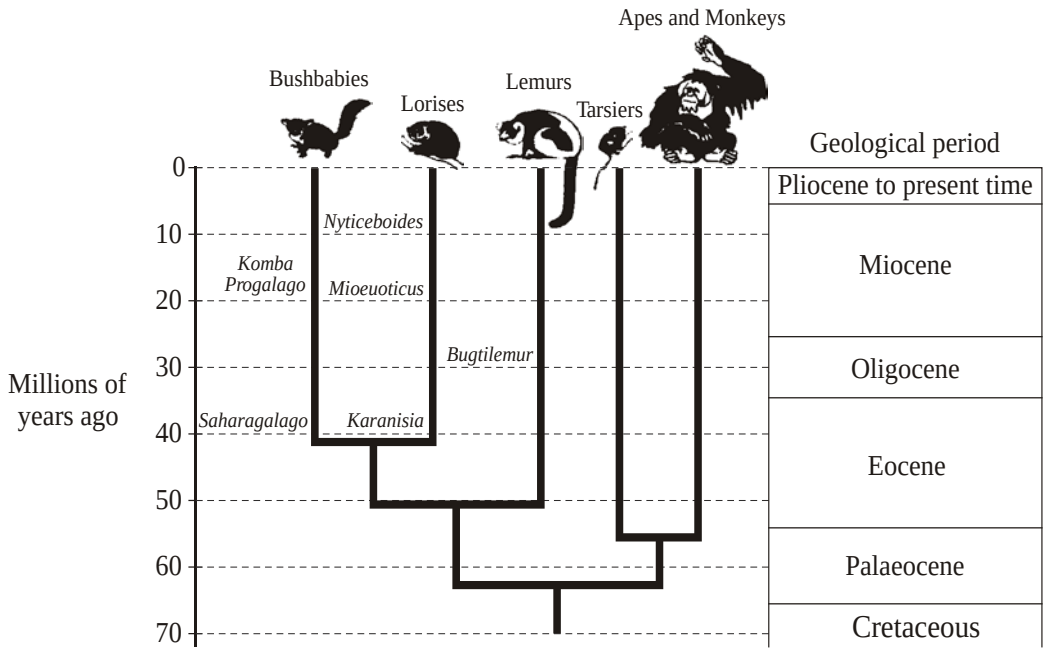
.....

(2 marks)

13

Turn over for the next question

6 The diagram shows an evolutionary tree for a group of animals called primates.
The names of extinct animals are printed in italics, eg *Nyticeboides.*
The drawings show animals that are alive today.



6 (a) (i) How many million years ago did *Karanisia* first appear?

..... millions of years ago.

(1 mark)

6 (a) (ii) During which geological period did the Apes and Monkeys begin to evolve?

.....

(1 mark)

6 (a) (iii) Which group of primates alive today are the closest relatives of the Lorises?

.....

(1 mark)

6 (b) Darwin was the first scientist to state that humans and other primates had common ancestors.
Many people were against Darwin's ideas at that time.
Give **two** reasons why they were against his ideas.

.....

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.....

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(2 marks)

5

7 The gemsbok is a large herbivore that lives in herds in desert areas of South Africa. Gemsboks feed on plants that are adapted to living in dry conditions. There are not many rivers, lakes or ponds that can provide drinking water for the animals. The desert areas are hot during the day but cool at night.

7 (a) A few lions live in the desert areas. They hunt and feed on the gemsboks.

Use information from the photograph of the gemsbok to suggest and explain **two** ways in which the gemsbok could avoid being killed by lions.

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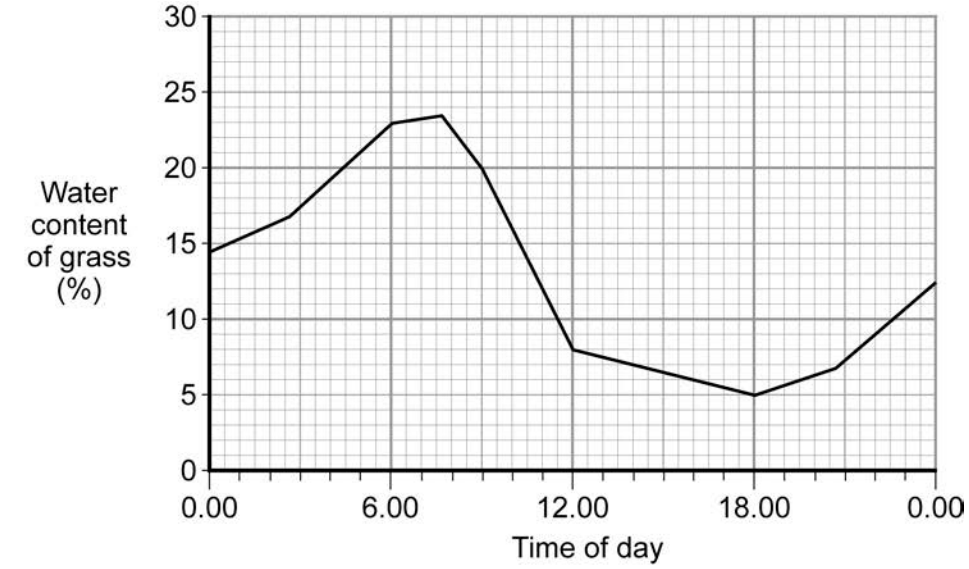
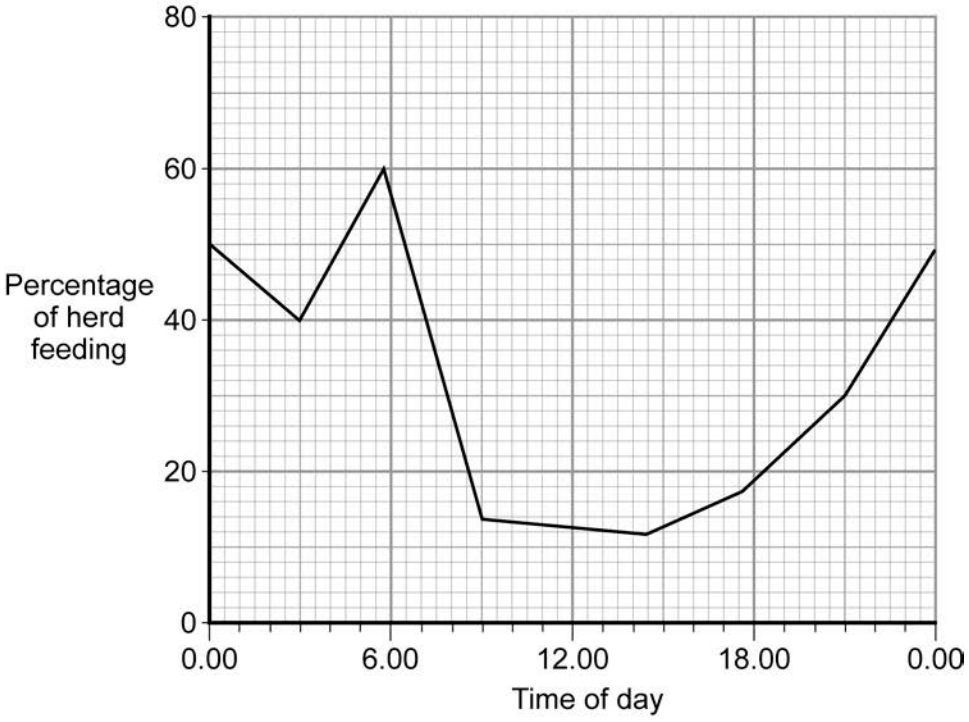
(2 marks)

Question 7 continues on the next page

7 (b) The graphs show the water content of the desert grass and the percentage of gemsboks feeding at different times of day.





7 (b) (i) Suggest why the water content of the grass changes during the day.

.....

.....

(1 mark)

7 (b) (ii) Between which times of day are more than 25 % of the herd feeding?

..... and ..... .

(1 mark)

7 (b) (iii) Explain **one** advantage to the gemsbok of feeding mainly at these times.

.....

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(2 marks)

6

Turn over for the next question

There are no questions printed on this page

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8 Energy is obtained from both aerobic and anaerobic respiration during exercise.

8 (a) Give **three** differences between aerobic and anaerobic respiration in humans.

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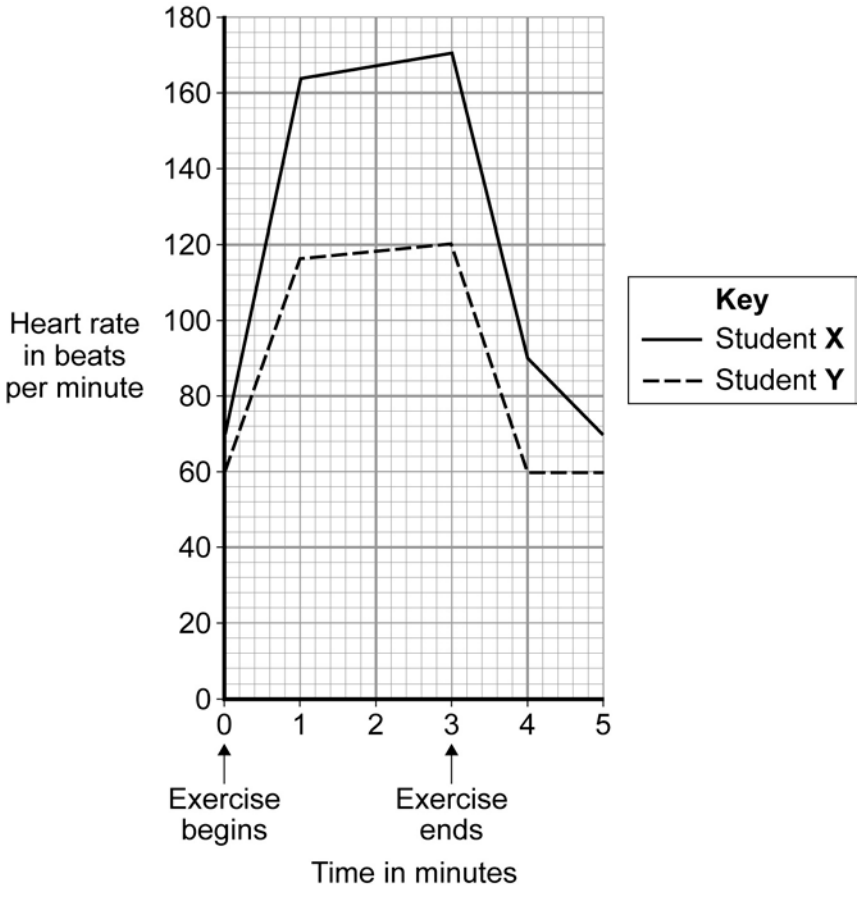
(3 marks)

Question 8 continues on the next page

8 (b) Two students did the same step-up exercise for 3 minutes.

One of the students was fit. The other student was unfit.

The graph shows how the students' heart rate changed during the exercise and after the exercise.



Use the information in the graph to suggest which student was the fitter.

Explain your answer.

.....

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(3 marks)

8 (c) Explain the advantage to the students of the change in heart rate during exercise.

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(4 marks)

10

END OF QUESTIONS

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Question 8(b) Photograph www.thinkstock.com