Rewarding Learning

Centre Number

71

Candidate Number

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

MV18

TUESDAY 14 MAY 2013, MORNING

TIME

1 hour, plus your additional time allowance.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.
Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in question **9(a)**.

1 (a) (i) The table below gives information about two minerals needed in our diet. Complete the table. [2]

Mineral	**Function**	**Source**
calcium		milk
iron	making red blood cells	

(ii) Give the role of fibre in our diet.

Circle the correct answer. [1]

provides energy : prevents constipation :

prevents scurvy

(b) (i) Complete the following sentences. [2]

Choose from:

boys : less active : active : girls

A person's gender (sex) can affect how much energy they need, _____ usually need **more energy** than _____ . Also, _____ people need **more energy** than _____ people.

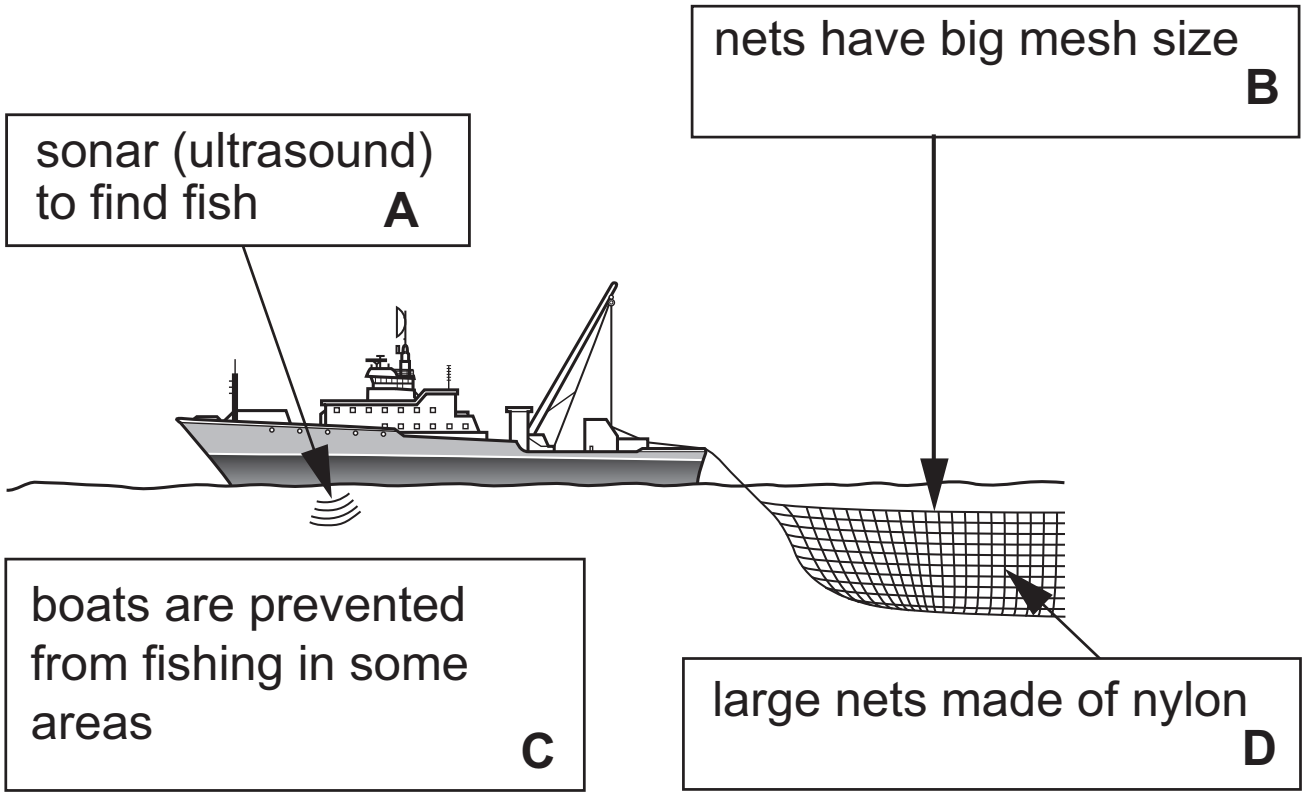
(ii) Apart from gender and activity, name **one** other thing that affects the energy we need. [1]

_____

2 Some types of fish in the Irish Sea are endangered and at risk of extinction due to overfishing.

(a) What is meant by the term 'extinction'? [1]

(b) Shown below are some features of modern fishing.



(i) Which **two** features shown on page 4 (**A**, **B**, **C** or **D**) will help protect fish numbers? [2]

_____ and _____

(ii) Apart from overfishing state **one** other thing that can cause some types of fish to become endangered. [1]

Choose from:

creating nature reserves : pollution :

animal testing

_____

3 Respiration and photosynthesis are processes involved in energy flow.

(a) Complete the word equation for **respiration**. [2]

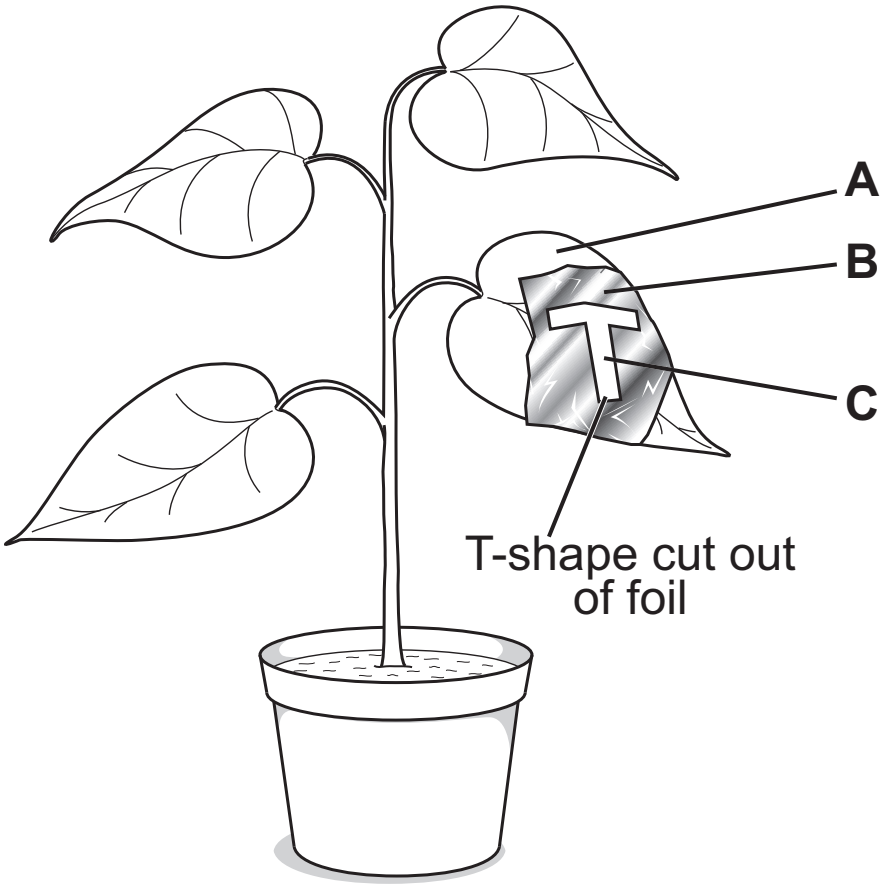
Choose from:

nitrogen : glucose : vitamin C : water

Oxygen **+** _____ → carbon dioxide **+** _____ **+** energy

A student set up the investigation below to test if light is needed for **photosynthesis**.

One leaf was covered with aluminium foil as shown.



The plant was left in bright light for 48 hours. The leaf was then removed and tested for starch using iodine.

(b) Complete the table below. [2]

Part of leaf	**Colour after starch test**	**Starch present or absent**
A	black	present
B		
C		

(c) Shown below is a simple food chain. [2]

NETTLE → **CATERPILLAR** → **BLUE TIT** → **HAWK**

(i) From the food chain name the:

producer. _____

secondary consumer. _____

(ii) What is the original source of energy in all food chains? [1]

_____

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4 **(a)** Given below are parts of the male reproductive system.

Using lines, link each part to its function. [2]

Part	**Function**
testes	nourishes (feeds) sperm
prostate gland	makes sperm
	tube which carries sperm

(b) Complete the sentence below to describe what a hormone is. [2]

Choose from:

chemical messengers : nervous system :

blood : nerve impulses

Hormones are _____ that travel in the _____ to a target organ where they act.

(c) The table below shows how the level of hormones controlling sexual development changes between the ages of ten and sixteen.

	Level of reproductive hormone/arbitrary units	
Age/years	**Females**	**Males**
10	4	2
11	6	3
12	10	6
13	9	8
14	8	10
15	7	9
16	5	8

The values for males have been plotted on the graph opposite.

(i) Plot and draw a line graph for the **females**. [3]

(ii) Describe fully the trend shown in **male** hormone levels. [1]

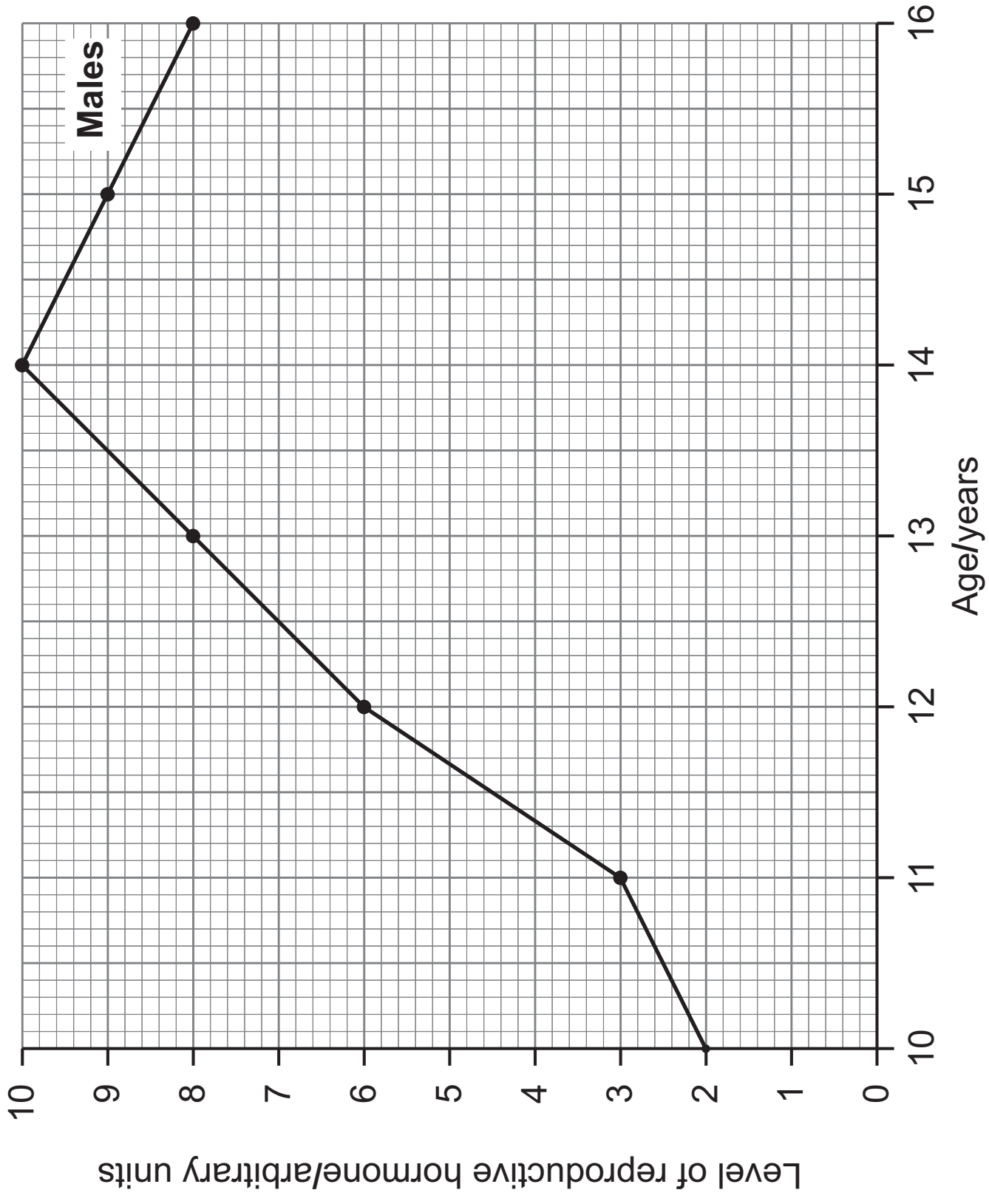
_____

_____

(iii) Identify **one** difference in the trend between male and female hormone levels. [1]

_____

_____


Males
Level of reproductive hormone/arbitrary units
0
1
2
3
4
5
6
7
8
9
10
Age/years
10
11
12
13
14
15
16

5 The table shows the results from an experiment investigating how the number of cress seedlings in a pot affects the mass of the seedlings.

Number of seedlings per pot	**Total mass of seedlings/g**	**Average mass of seedlings/g**
1	20	20
5	65	13
10		7
15	90	

(a) Complete the table by calculating the missing values. [2]

(b) Describe **and** explain how the number of seedlings per pot affects the **average mass** of seedlings. [3]

_____

_____

_____

_____

_____

_____

(c) Suggest **two** things that had to be kept the same in this investigation to make the results valid. [2]

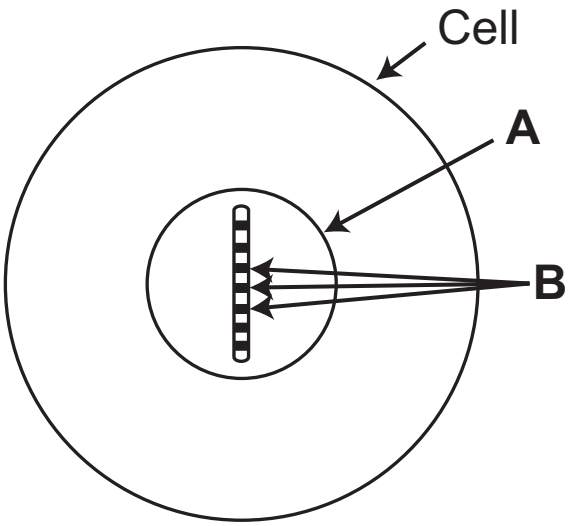
1. _____

_____

2. _____

_____

6 **(a)** The diagram represents an animal cell. Only one chromosome is shown.



(i) Name the structure labelled **A**. [1]

_____

(ii) Name the structures labelled **B** on the chromosome. [1]

_____

(b) Tulip flowers can be red or white. The allele for red colour is dominant to the allele for white colour.

(i) Complete the genetic diagram below to show the offspring of a cross between a **heterozygous** red tulip and a white tulip. [2]

Use the symbols; R **=** red r **=** white

		Red	
		R	
White		Rr	
	r		rr

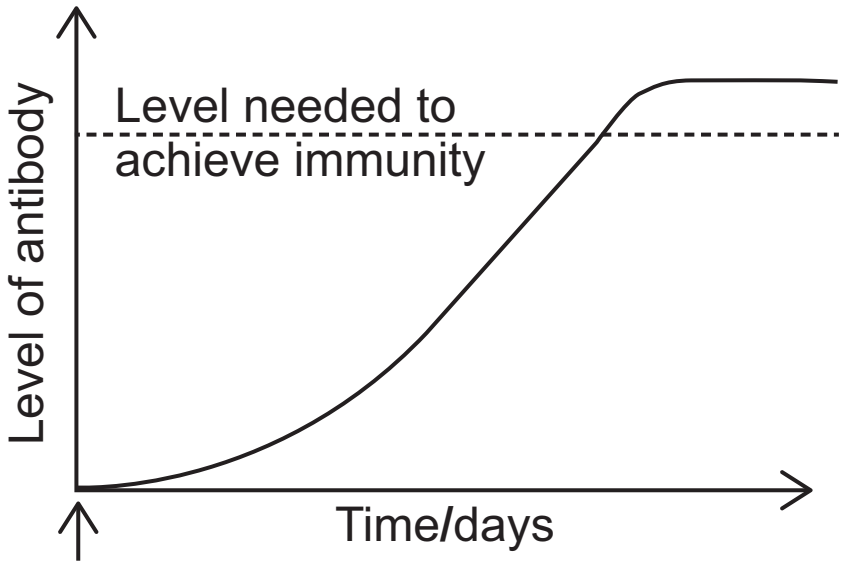
(ii) What percentage of the offspring are white? [1]

_____**%**

(iii) Give the genotype of a **homozygous** red tulip. [1]

_____

7 **(a)** The following graph shows how our antibody level changes when we have a bacterial infection.



(i) Suggest why there is a delay between infection and achieving immunity. [1]

_____

_____

(ii) Using the graph above, give **two** pieces of evidence that show the immunity achieved is active immunity. [2]

1. _____

_____

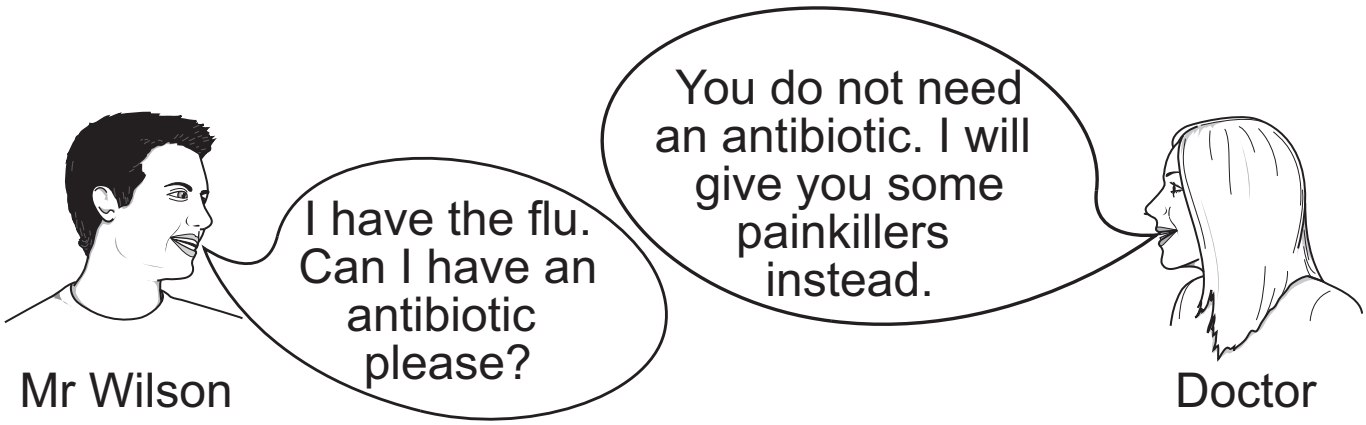
2. _____

_____

(b) Phagocytosis also helps protect against bacterial infection.

Describe fully the process of phagocytosis. [2]

(c) The following diagram shows Mr Wilson talking to his doctor.



(i) Explain fully why the doctor did not prescribe an antibiotic for Mr Wilson's flu. [2]

(ii) Suggest why new types of antibiotics need to be continually developed. [1]

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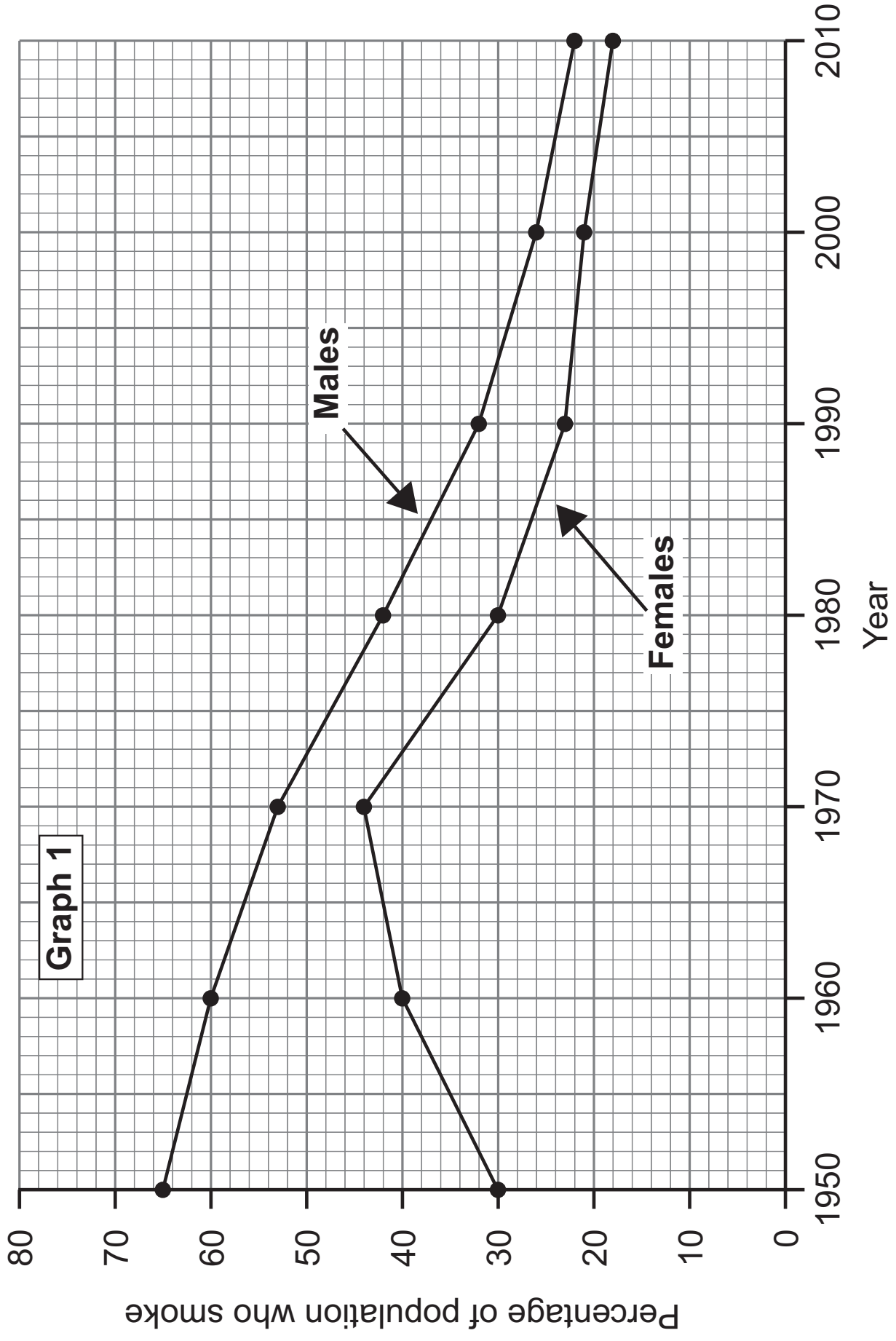
(Questions continue overleaf)

8 **Graph 1** opposite shows the percentage of the population who were smokers between the years 1950–2010.

(a) Which year had the maximum percentage of female smokers? [1]

_____

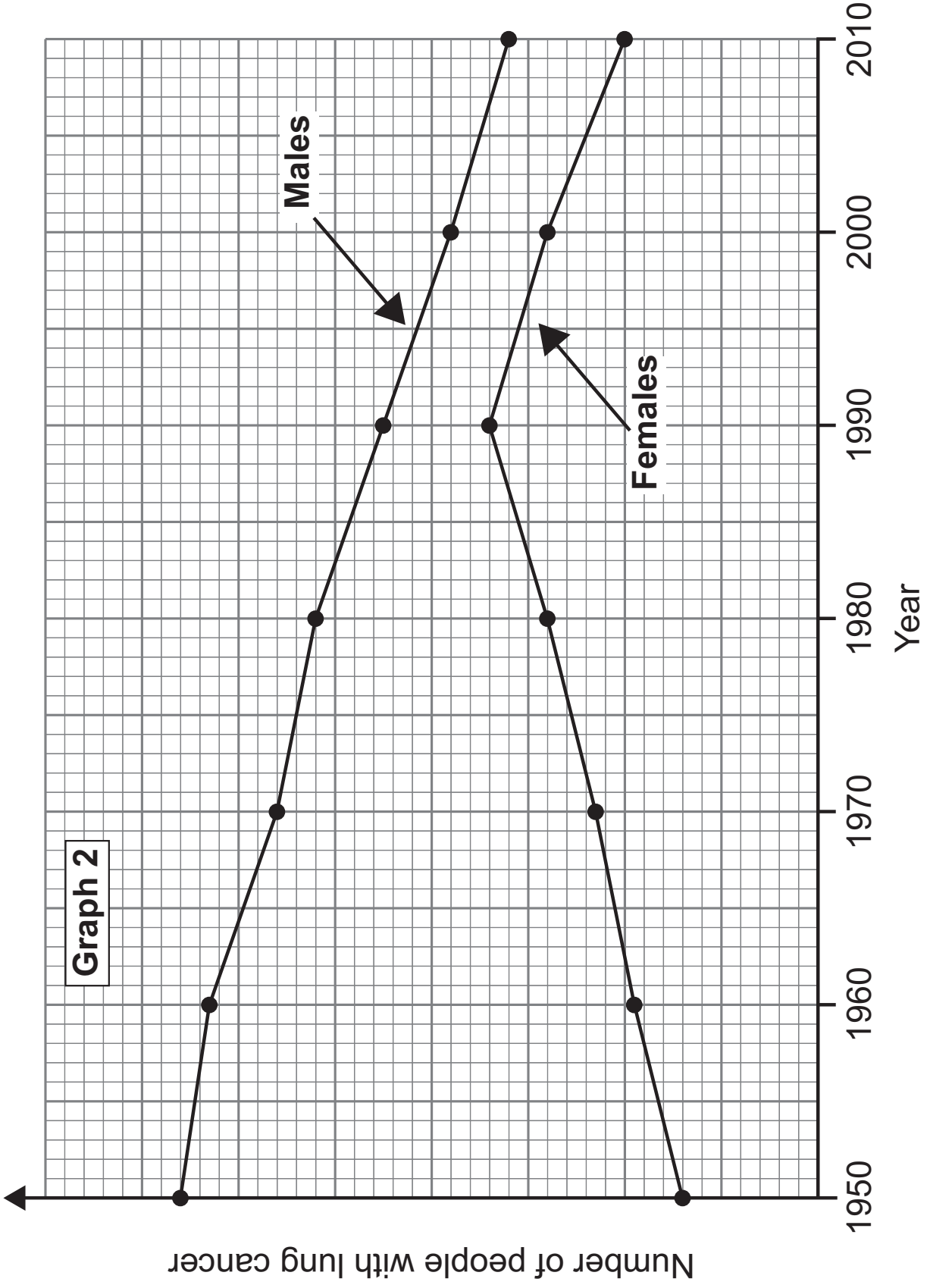

Graph 1
Males
Females
Percentage of population who smoke
0
10
20
30
40
50
60
70
80
1950
1960
1970
1980
1990
2000
2010
Year

Graph 2 opposite shows how the number of people with lung cancer changed between the years 1950–2010.

(b) Use **Graphs 1** and **2** to describe **and** explain the evidence that links smoking to lung cancer. [3]

(c) Apart from causing lung cancer, smoking affects smokers in many other ways. For example, many smokers often lack energy.

Explain why. [2]


Graph 2
Males
Females
1950
1960
1970
1980
1990
2000
2010
Year
Number of people with lung cancer

9 (a) Global warming is a result of the carbon cycle becoming unbalanced. Give an account of global warming. [6]

Your account should describe **and** explain:

- the causes
- the effects
- what can be done to reduce global warming.

In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

(b) Pollution in the environment can be monitored through the use of biotic indicators such as lichens. Explain why lichens are effective in doing this. [1]

THIS IS THE END OF THE QUESTION PAPER

For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	