

FOR OFFICIAL USE

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KU PS

Total Mark

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**3700/402**

NATIONAL  
QUALIFICATIONS  
2007

MONDAY, 21 MAY  
10.20 AM – 11.35 AM

SCIENCE  
STANDARD GRADE  
General Level

**Fill in these boxes and read what is printed below.**

Full name of centre

Town



Forename(s)

Surname



Date of birth

Day Month Year

Scottish candidate number

Number of seat

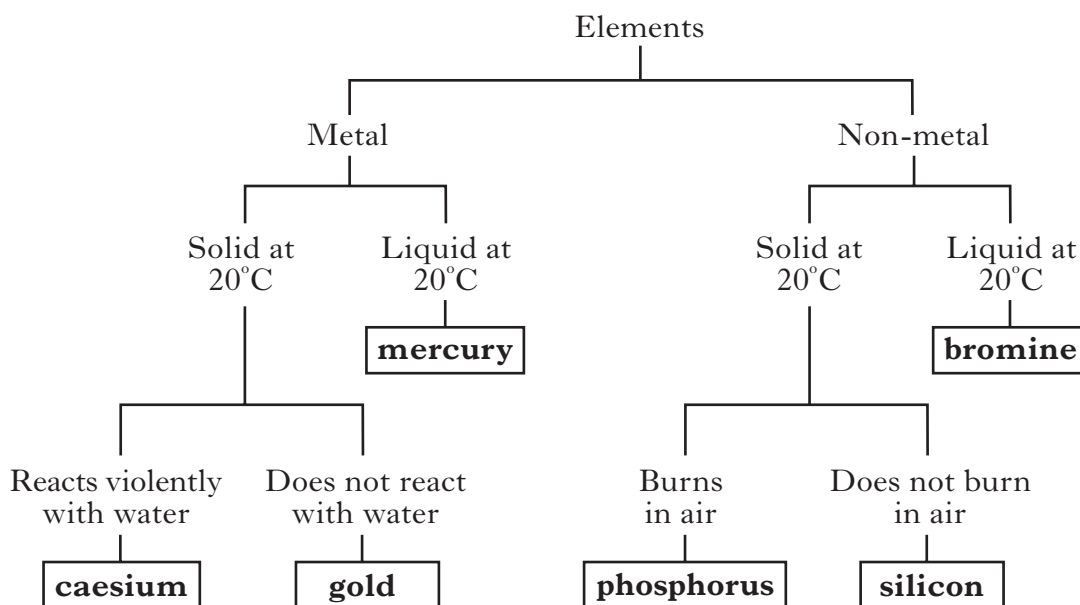
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- 1 Answer as many questions as you can.
- 2 Read the whole of each question carefully before you answer it.
- 3 Write your answers in the spaces provided. Showing working may help in some questions.
- 4 Before leaving the examination room you must give this book to the invigilator. If you do not, you may lose all the marks for this paper.



1. The key describes different elements and their properties.



Use the information in the key to answer the questions.

(a) Give one **difference** between mercury and bromine.

.....

(b) List **all** the information that the key gives about phosphorus.

.....  
 .....  
 .....

2. Use **two** of the words from the box to complete the sentences below.

heat	light	chemical
fat	starch	protein

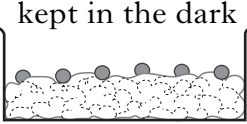
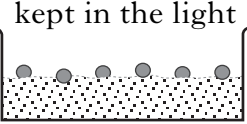
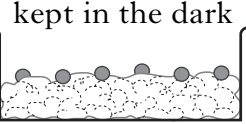
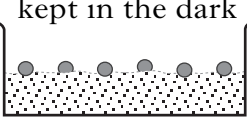
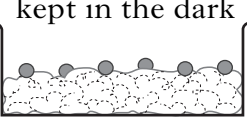
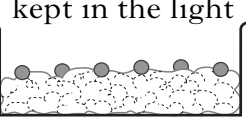
Green plants use ..... energy from the Sun to make food.

Green plants store this food as a substance called.....

Marks	KU	PS
1		
2		
2		

3. Candice investigated the conditions that affect the germination of seeds.  
She set up the following experiments.

Marks

<p><b>A</b></p>  <p>kept in the dark</p> <p>cotton wool 10 ml of water</p>	<p><b>B</b></p>  <p>kept in the light</p> <p>fine sand 10 ml of water</p>	<p><b>C</b></p>  <p>kept in the dark</p> <p>cotton wool 15 ml of water</p>
<p><b>D</b></p>  <p>kept in the dark</p> <p>fine sand 10 ml of water</p>	<p><b>E</b></p>  <p>kept in the dark</p> <p>cotton wool 20 ml of water</p>	<p><b>F</b></p>  <p>kept in the light</p> <p>cotton wool 25 ml of water</p>

(a) Which **two** experiments should Candice compare to find out if light affects the germination of seeds?

Letters ..... and .....

1

(b) What would Candice be trying to find out if she compared experiments A, C and E?

.....

1

(c) To make the investigation fair, Candice put six seeds in each dish.  
Give another factor which she should keep the same.

.....

1

[Turn over

KU	PS

4. The box below shows some types of fire extinguisher.

water	powder	foam	fire blanket
-------	--------	------	--------------

Which type of fire extinguisher

(a) should be used to put out a burning television?

.....

(b) must **not** be used to put out a chip pan fire?

.....

5. The boxes below show parts of the breathing and circulation systems.

1	ribcage	2	diaphragm	3	heart
4	windpipe	5	lungs	6	nose

Which part

(a) allows dangerous solvent fumes to pass into the blood?

Box number .....

(b) moves upwards and outwards when we breathe **in**?

Box number .....

(c) moves upwards when we breathe **out**?

Box number .....

Marks

KU	PS

1

1

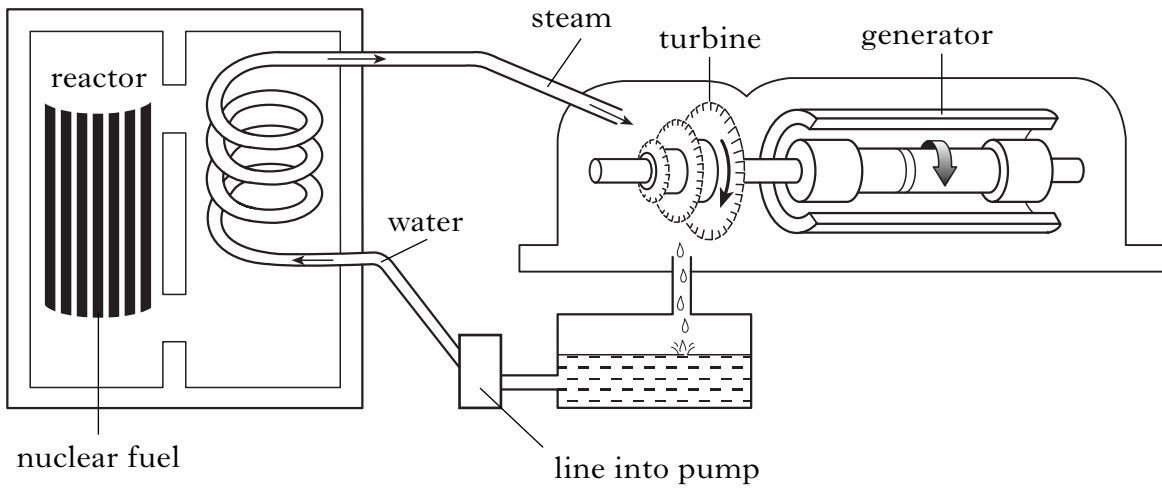
1

1

1

6. A diagram of a nuclear power station is shown below.

Marks



(a) In a nuclear power station, the nuclear fuel produces heat energy.

The heat energy is used to

- A change steam into water
- B keep the water circulating
- C pump the water
- D change water into steam.

**Underline** the correct answer.

1

(b) In the power station

- A the steam turns the generator which turns the turbine
- B the water turns the generator which turns the turbine
- C the turbine turns the generator to produce electricity
- D the generator turns the turbine to produce electricity.

**Underline** the correct answer.

1

(c) The radioactive waste from a nuclear power station is very dangerous.

Describe one way of storing the waste as safely as possible.

.....

1

[Turn over

	KU	PS



8. Some properties of materials are shown below.

Marks

wear resistant	strong	corrosion resistant
flammable	elastic	heat resistant

Use some of these properties to complete the table.

<i>Material</i>	<i>Use</i>	<i>Property of material</i>
wax	candles	
polyester	carpets	
copper	water pipes	

3

9. The boxes show scientific units.

1		2		3	
	kWh		A		mA
4		5		6	
	V		W		kV

Which box shows

(a) the unit for the **power rating** of an electrical appliance?

Box number .....

1

(b) the unit for **energy consumption** of an electrical appliance?

Box number .....

1

[Turn over

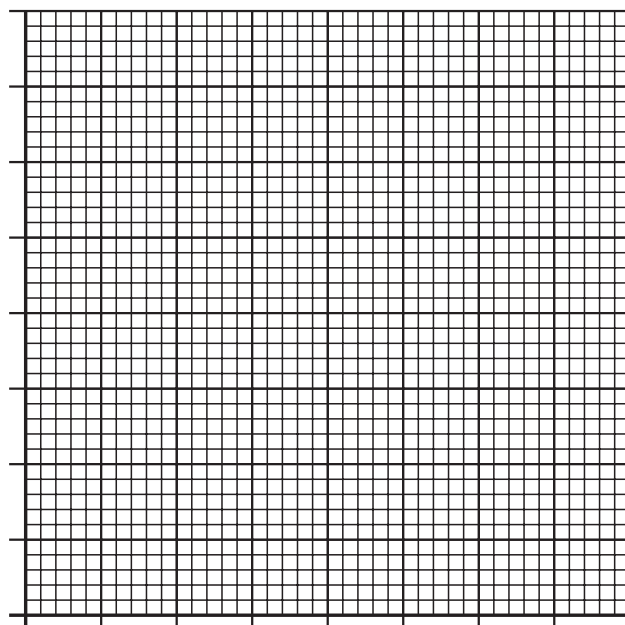
10. The table below shows the energy used by a 15 year old girl when carrying out various activities.

Marks

<i>Activity</i>	<i>Energy used (kJ/hour)</i>
walking	1000
studying	500
cycling	2000
sleeping	250

Present the information in the table as a **bar graph**.

(Additional graph paper, if required, may be found on page 23.)



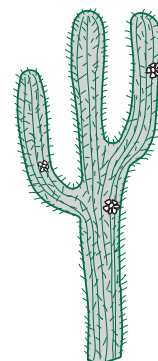
KU	PS
3	



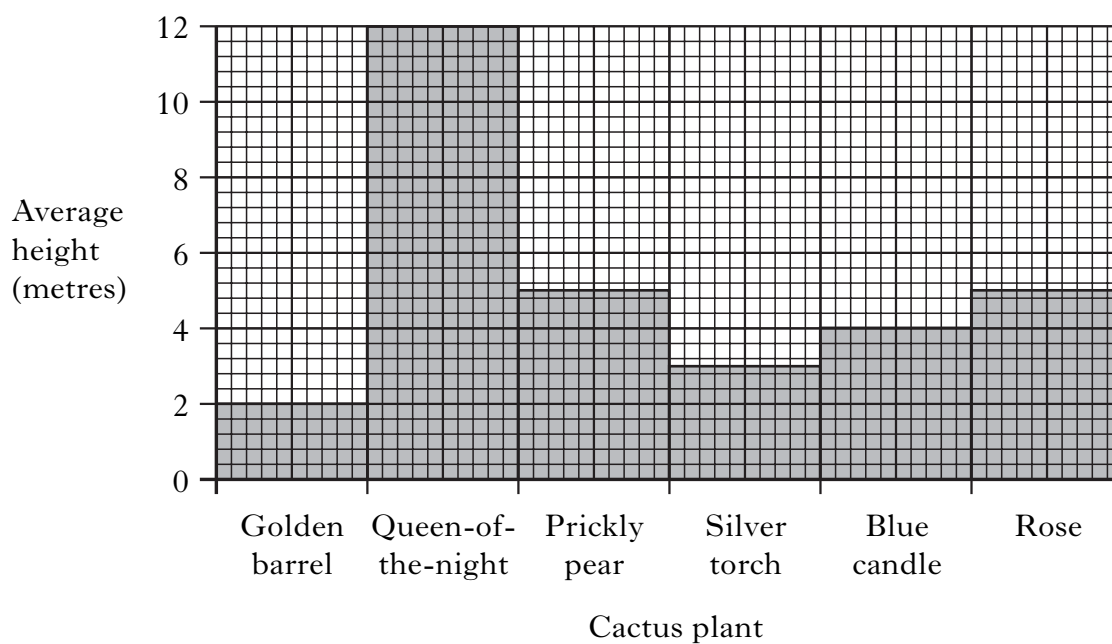
14. Cactus plants have fleshy stems covered with spines. Many cactus plants produce flowers.

The table shows information about some cactus plants.

<i>Cactus plant</i>	<i>Colour of spines</i>	<i>Colour of flowers</i>
Golden barrel	yellow	pink
Queen-of-the-night	yellow	white
Prickly pear	white	yellow
Silver torch	white	red
Blue candle	black	white
Rose	black	pink



The graph shows the average height of each cactus plant.



14. (continued)

Marks	KU	PS
1		
1		
1		
1		
3		

Use the information to answer the following questions.

(a) Which cactus plant has an average height of 5 metres and has yellow flowers?

.....

(b) What is the average height of the cactus plant with white spines and red flowers?

..... metres

(c) Two of the cactus plants have pink flowers.  
Which **one** has the greater average height?

.....

(d) Name and describe the cactus plant with an average height of 4 metres.

Name .....

Description .....

15. Complete the following sentences about steel by **circling** the correct answer in each box.

Increasing the percentage of **carbon** in steel increases its

- resistance to corrosion
- resistance to wear
- hardness

Adding **chromium and nickel** to steel increases its

- resistance to corrosion
- resistance to wear
- hardness

Adding **tungsten** to steel increases its

- resistance to corrosion
- resistance to wear
- hardness

16. (a) Bill measured his fitness level using a simple Step Test method.

He stepped up and down at a steady rate for five minutes.

He measured his pulse rate one minute after he stopped exercising, then calculated his **fitness index** using the formula shown below.

$$\text{Fitness index} = \frac{30\,000}{5 \times \text{pulse rate}}$$

Bill found his **fitness level** using the chart below.

<i>Fitness index</i>	0	10	20	30	40	50	60	70	80	90	100	
<i>Fitness level</i>	poor					average			good			

(i) Bill had a fitness index of 65. What was his **fitness level**?

Circle the correct answer.

poor	average	good
------	---------	------

(ii) Using the same Step Test method, Katy had a pulse rate of 80.

Use the formula to calculate her **fitness index**.

Space for working

Fitness index .....

Marks

KU	PS
1	
2	

16. (continued)

(b) Marina trained regularly and improved her ability to bend and stretch without causing muscle damage.

Which aspect of her fitness has improved?

Circle the correct answer.

strength	suppleness	stamina
----------	------------	---------

(c) Complete the following sentences by circling the correct word in each box.

(i) During exercise the pulse rate 

increases	decreases
-----------	-----------

 and

the blood flows more 

quickly	slowly
---------	--------

 .

(ii) Food and oxygen pass from the blood through the thin walls of

the 

arteries	capillaries	veins
----------	-------------	-------

 into the muscles.

(iii) Valves in the 

arteries	capillaries	veins
----------	-------------	-------

 prevent the blood from flowing backwards.

17. A substance that produces carbon monoxide when it burns **must**

- A be petrol
- B contain carbon
- C be coal
- D contain oxygen.

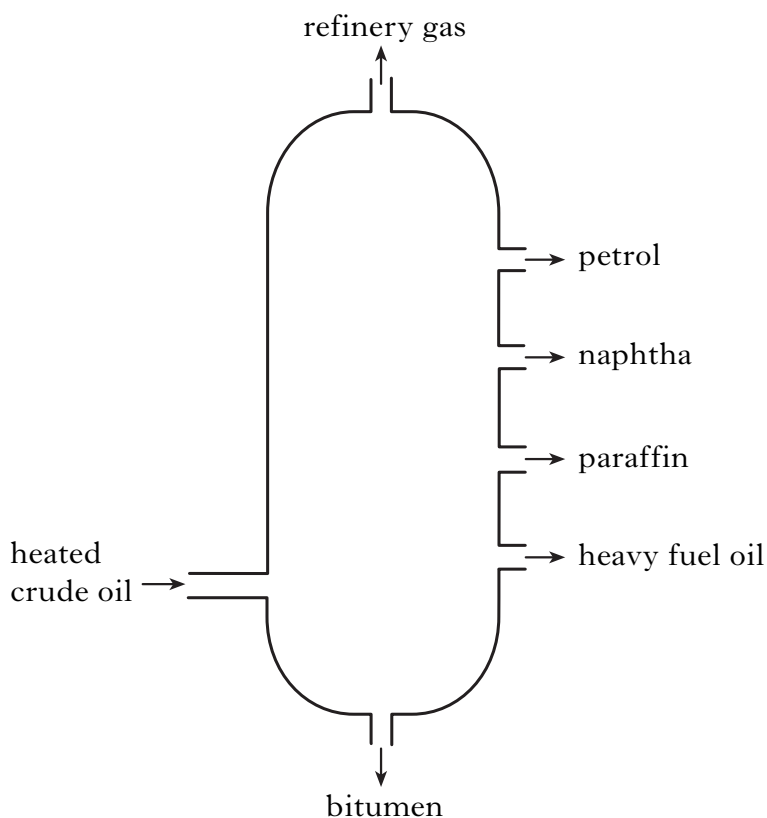
Underline the correct answer.

Marks

	KU	PS
1		
1		
1		
1		
1		
1		

[Turn over

18. A fractionating column is used to separate crude oil into the different fractions shown.



Marks

KU	PS
1	
1	
1	
1	

(a) Which fraction is used

(i) to make road surfaces?

.....

1

(ii) as a fuel in jet aircraft?

.....

1

(b) Complete the following sentences by circling the correct word in each box.

(i) Petrol is 

more	less
------	------

 viscous than paraffin.

1

(ii) Bitumen is 

darker	lighter
--------	---------

 in colour than naphtha.

1

19. A sample of an alloy known as “Wood’s metal” was made by mixing together 16 g of bismuth, 8 g of lead, 4 g of cadmium and 4 g of tin.

What percentage of the alloy is lead?

Space for working

Answer ..... %

Marks

KU	PS
2	

**[Turn over**



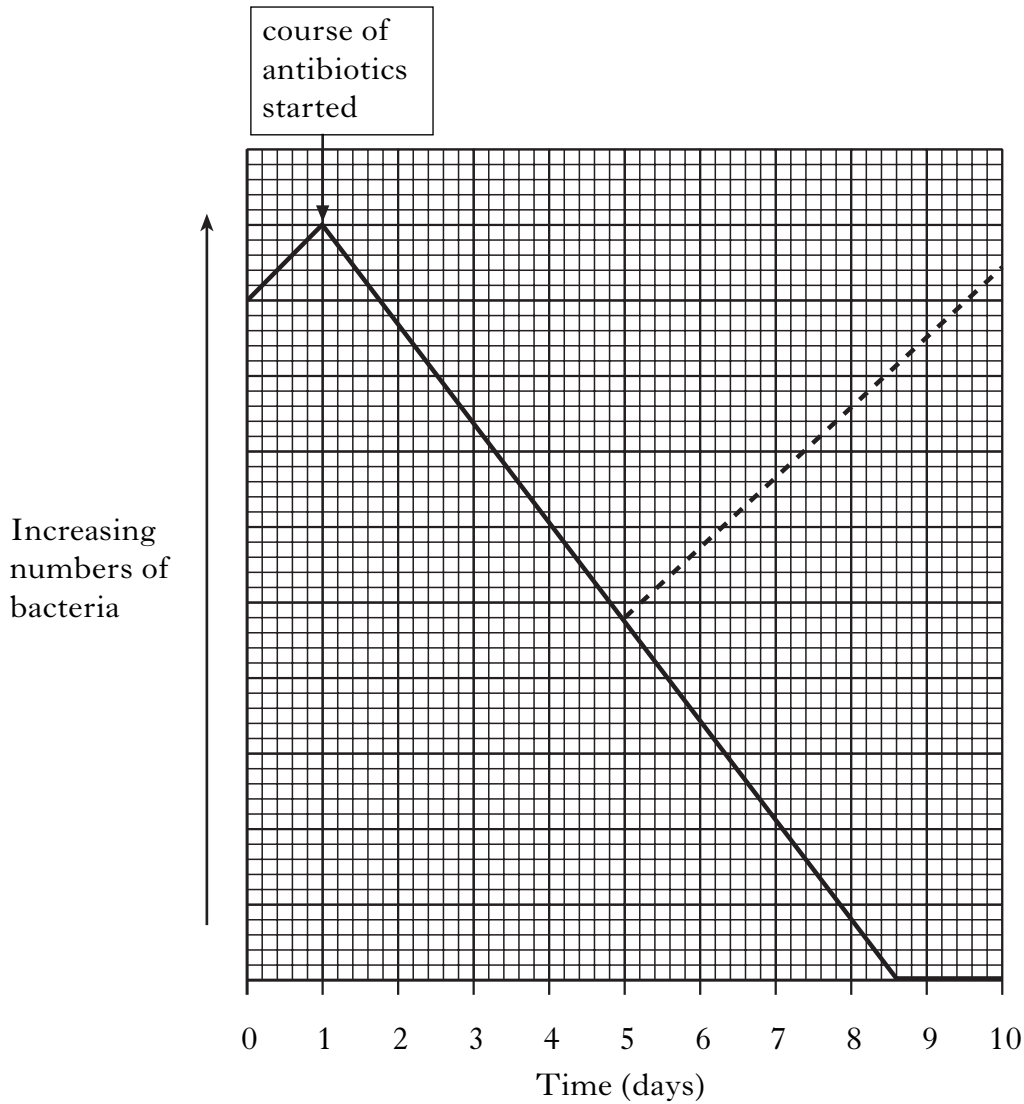


22. (a) Antibiotics are drugs which can kill bacteria.  
A full course of antibiotics should cure a bacterial infection. It is important not to stop taking the antibiotics after only a few days.

The graph shows the effect of an antibiotic on the numbers of bacteria.

**Key**

- antibiotic taken for a full ten-day course
- antibiotic taken for only four days



22. (a) (continued)

Use the information to answer the questions.

(i) Why is it not advisable to stop taking the antibiotic after only 4 days?

.....

1

(ii) Sunita had a throat infection.

Explain why she would have recovered fully with a full ten-day course of the antibiotic.

.....

1

(b) (i) White blood cells help to destroy bacteria.

Give **one** way in which they do this.

.....

1

(ii) **White blood cells** and **platelets** are two parts of blood.

Name the **two** other parts of blood.

..... and .....

2

Marks	KU	PS
1		
1		
1		
2		

[Turn over

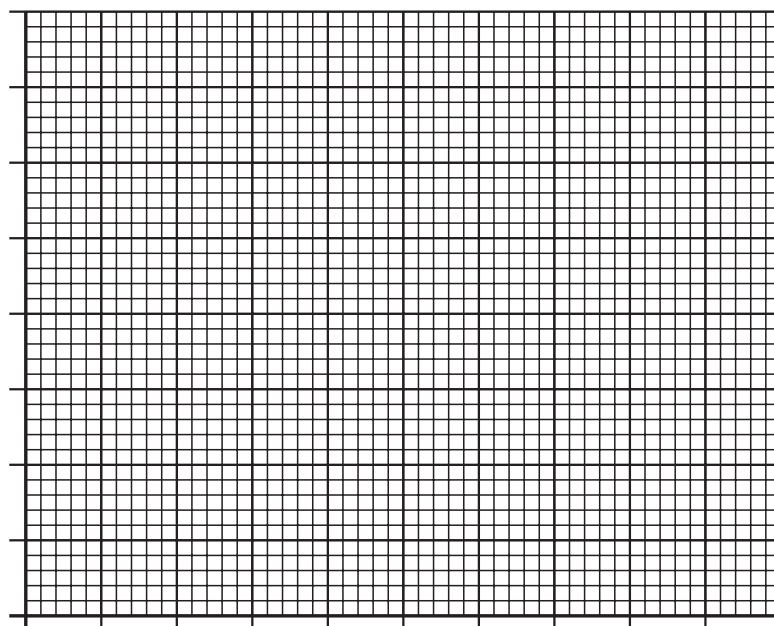
23. (a) A scientist measured the activity of a radioactive source over a period of time. Marks

His results are shown below.

<i>Time</i> (s)	<i>Activity</i> (Bq)
0	80
20	57
40	40
60	28
80	20
100	14

Draw a line graph to show these results.

(Additional graph paper, if required, may be found on page 23.)



Time (s)

3

KU	PS



24. (a) A group of pupils investigated the level of air pollution in a town.

They counted how many types of lichen were growing on trees at four different sites. For each site, they recorded the percentage lichen cover and the distance from the town centre.

Their results are shown below.

<i>Site</i>	<i>Number of lichen types</i>	<i>Percentage lichen cover (%)</i>	<i>Distance from town centre (km)</i>
A	1	2	0
B	2	4	1
C	4	20	5
D	6	58	10

(i) Which site was **most polluted**?

Site .....

(ii) Draw **two** conclusions from these results.

1 .....

.....

2 .....

.....

(b) Breathing polluted air can cause cancers.

Name another disease caused by breathing polluted air.

.....

Marks

KU	PS

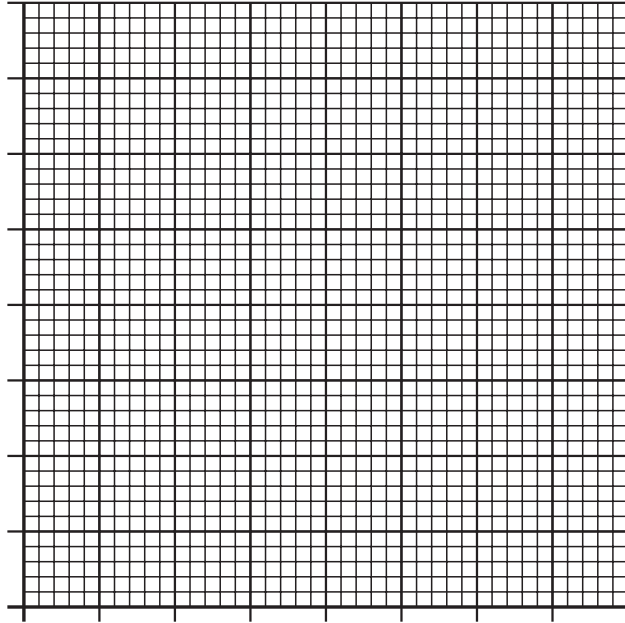
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2

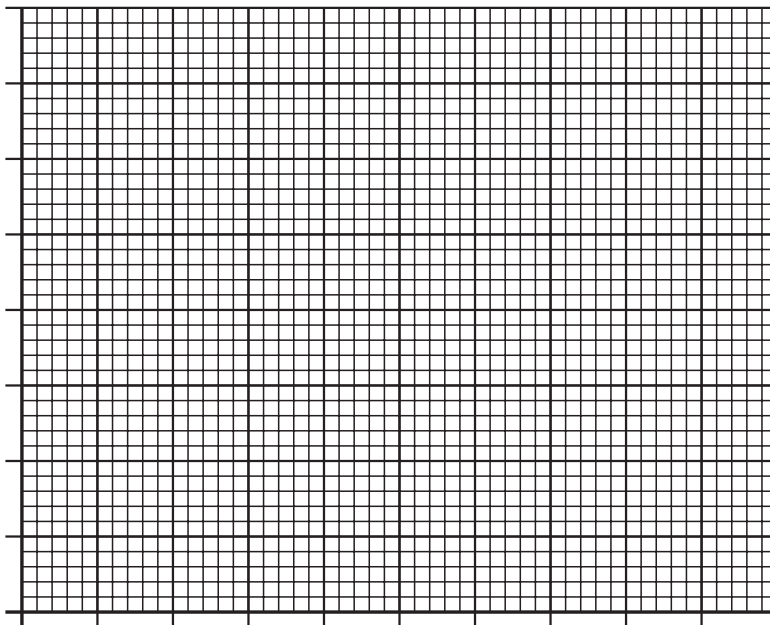
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[END OF QUESTION PAPER]

ADDITIONAL GRAPH PAPER FOR USE IN QUESTION 10



ADDITIONAL GRAPH PAPER FOR USE IN QUESTION 23(a)



Time (s)

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