

FOR OFFICIAL USE

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| KU | PS |
| Total Mark | |

3700/401

NATIONAL
QUALIFICATIONS
2011

MONDAY, 23 MAY
9.00 AM – 10.00 AM

SCIENCE
STANDARD GRADE
Foundation Level

Fill in these boxes and read what is printed below.

Full name of centre

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Town

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Forename(s)

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Surname

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Date of birth

Day Month Year

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Scottish candidate number

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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.



| | | Marks | KU | PS |
|---|---|-------------------|----|----|
| 1. | Part of the index of a book is shown below. | | | |
| Absorption | 11 | Radiation – gamma | 19 | |
| Aerial | 3 | – infrared | 4 | |
| Burglar alarm | 6 | – ultraviolet | 8 | |
| Computer – desktop | 15 | Radio waves | 9 | |
| – laptop | 18 | Reflection | 5 | |
| Cooking | 13 | Remote control | 3 | |
| Heat loss – conduction | 2 | Security light | 7 | |
| – convection | 2 | Sunbeds | 9 | |
| Light | 1 | Television | 10 | |
| Medical images | 21 | Transmitter | 14 | |
| Microwaves | 12 | Wavelength | 1 | |
| Mobile phone | 12 | Wireless network | 23 | |
| Optical fibre | 17 | X-rays | 20 | |
| (a) Which two pages should you look up to find out about using microwaves for cooking? | | | | |
| Pages | and | | 1 | |
| (b) Lindsey looked up pages 4 and 7. | | | | |
| What was she trying to find out about? | | | | |
| | | | 1 | |

| Marks | |
|-------|----|
| KU | PS |
| | |
| | |

2. (a) What is normal body temperature?

- A 27 °C
- B 35 °C
- C 37 °C
- D 40 °C

Underline the correct answer.

1

- (b) Complete each sentence by **circling** the correct answer.

Energy must be supplied from food
the Sun to maintain your body temperature.

If the air temperature is lower than your body temperature, your body will lose heat and you may start to sweat
shiver.

2

3. A number of different materials have been grouped together in the table below. Give **three** suitable headings for the table.

| | | |
|--------|----------|----------------|
| | | |
| water | nylon | oxygen |
| petrol | concrete | carbon dioxide |
| milk | wood | air |

1

[Turn over

4.

Birds

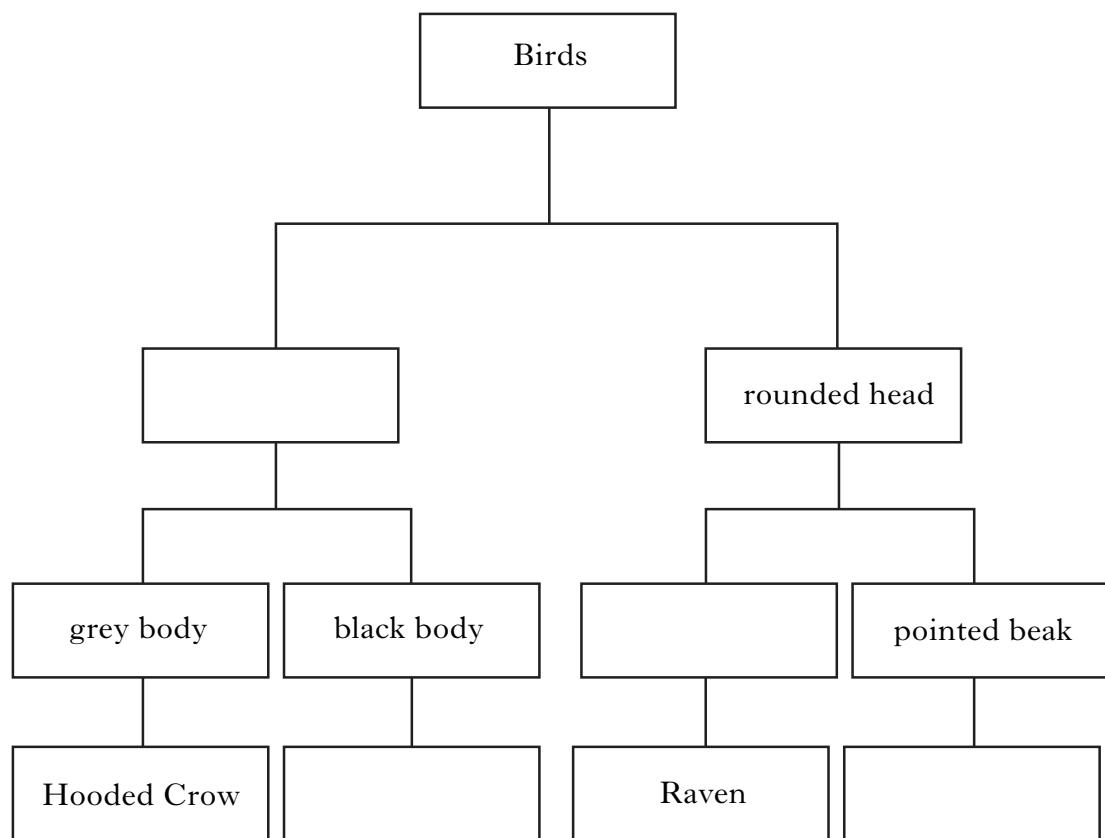
The Hooded Crow and the Carrion Crow have flat heads.

The Raven and the Rook have rounded heads.

The Hooded Crow has a grey body and the Carrion Crow's body is black.

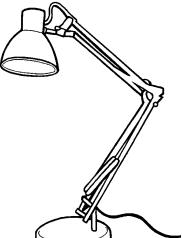
The Raven has a curved beak and the Rook's beak is pointed.

Use the information to complete the following key.



2

5. Some electrical appliances are shown in the grid below.

| | |
|---|--|
| 1 |  A line drawing of an open laptop computer. |
| 2 |  A line drawing of a desk lamp with a flexible gooseneck and a round base. |
| 3 |  A line drawing of a hair dryer with a coiled cord. |
| 4 |  A line drawing of a DVD player with a disc in front and a power cord. |

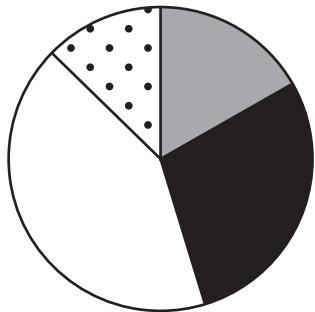
Which electrical appliance is the **most expensive** to use for ten minutes?

Box number

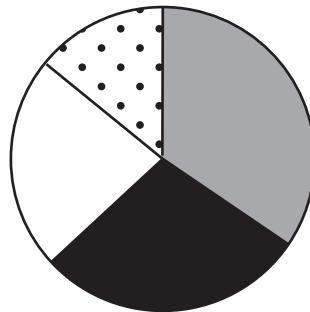
1

6. The pie charts show the main use of energy in the UK in 1960 and 2000.

Energy use in 1960



Energy use in 2000



-  transport
-  domestic
-  services
-  industry

(a) What was the largest use of energy in 2000?

¹ See, for example, the discussion of the relationship between the U.S. and the European Union in the final section of this paper.

1

(b) Which energy use **decreased** from 1960 to 2000?

¹ See, for example, the discussion of the relationship between the U.S. and European approaches to the same problem in the following section.

1

| Marks | | |
|-------|--|----|
| | KU | PS |
| 7. | Uses of different materials are shown below. | |
| | | |

| | | | |
|----------------|-------------|-------------------|---------------------|
| insulated cups | girders | electrical wiring | toothbrush bristles |
| carpets | water pipes | railway lines | packaging |

Select **two** uses for

(a) polystyrene

1

2

1

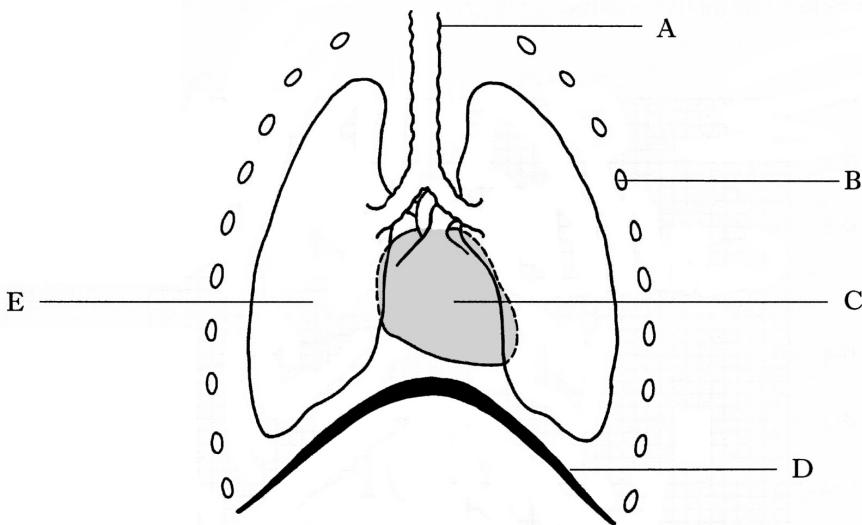
(b) copper

1

2

1

8. The diagram shows parts of the body.



- (a) Which letter shows

- (i) the windpipe?

Letter

- (ii) the heart?

Letter

- (b) Which of the following statements describes the function of the heart?

- A Cleans the blood
 - B Pumps blood around the body
 - C Allows oxygen into the blood
 - D Maintains the temperature of the blood

Underline the correct answer.

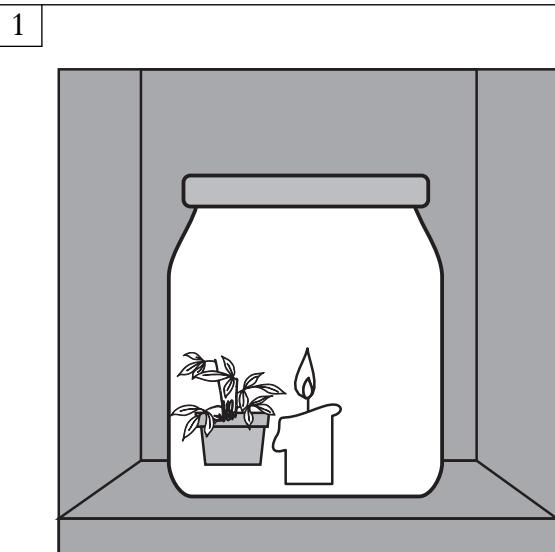
- (c) One factor which can increase the risk of heart disease is smoking. Give **one** other factor which can increase the risk of heart disease.

¹ See, for example, the discussion of the relationship between the U.S. and the European Union in the final section of this paper.

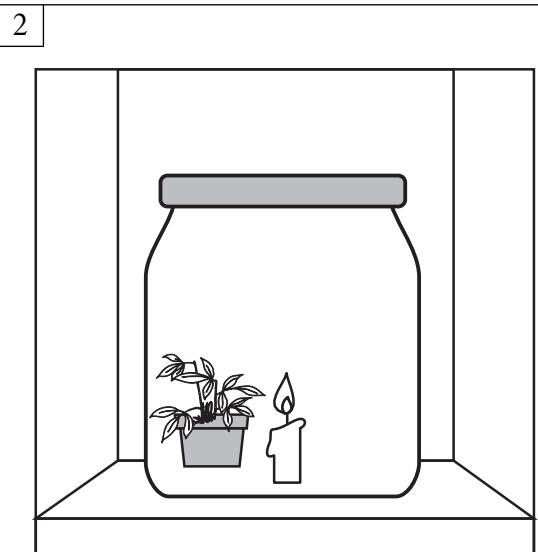
[Turn over

9. Joseph set up experiments with green plants as shown below.

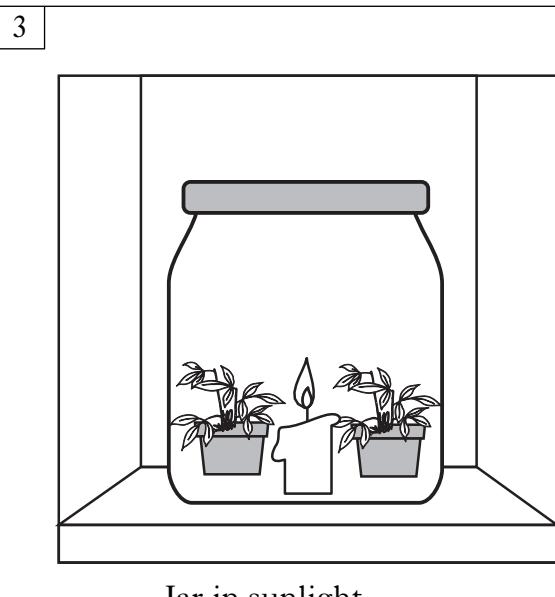
He lit the candles and timed how long each one burned.



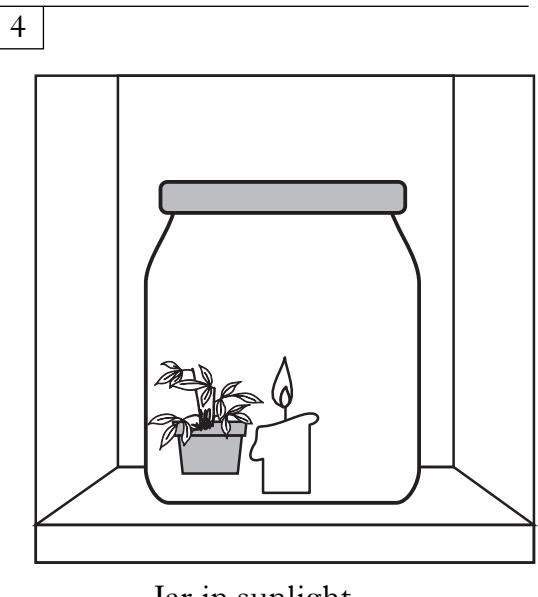
Jar in dark cupboard



Jar in sunlight



Jar in sunlight



Jar in sunlight

- (a) Joseph wanted to find out if the number of plants affects how long each candle burned.

Which **two** boxes show the experiments he should compare for a fair test?

Box numbers and

1

- (b) Joseph compared the experiments in boxes 1 and 4.

What was he trying to find out?

.....

1

| Marks | | |
|-------|----|----|
| | KU | PS |
| 1 | | |
| 1 | | |
| 1 | | |

10. The table shows how the volume of air in the lungs and the lung pressure change during warm-up exercises.

| Exercise time (minutes) | Volume of air in the lungs (cm ³) | Lung pressure (kPa) |
|----------------------------|--|------------------------|
| 2 | 2400 | 100 |
| 4 | 2750 | 99 |
| 6 | 3000 | 98 |
| 8 | 3200 | 97 |

- (a) (i) Complete the conclusion by circling the correct answer.

As exercise time increases, the volume of air in the lungs

| | |
|----------------|---|
| increases | . |
| decreases | . |
| stays the same | . |

1

- (ii) Draw one other conclusion from these results.

.....
.....

1

- (b) Predict the volume of air in the lungs after 3 minutes.

..... cm³

1

[Turn over

| <i>Marks</i> | KU | PS |
|--------------|----|----|
| 1 | | |
| 1 | | |
| 1 | | |
| 1 | | |

11. The boxes show different substances.

| | | | |
|---|-------|---|-----------|
| 1 | metal | 2 | pesticide |
| 3 | smoke | 4 | water |

(a) Which box shows

(i) a basic human need?

Box number

1

(ii) a substance which can pollute the air?

Box number

1

(iii) a **type** of household waste which can be easily recycled?

Box number
.....

1

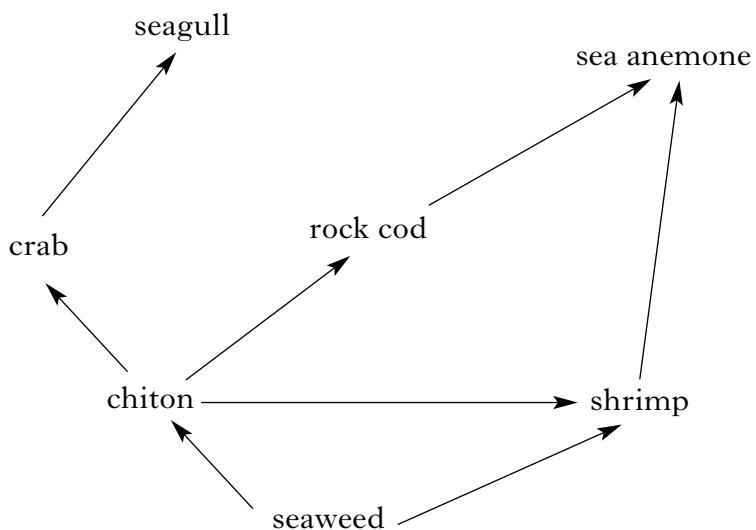
(b) A building firm cleared land to build houses.

However, they did not cut down all the old trees and also planted some new trees.

What word is used to describe meeting basic needs without damaging the environment?

Digitized by srujanika@gmail.com

12. A food web from a rocky shore is shown below.



- (a) **From the food web**, give a food chain showing **four** organisms.

..... →

1

- (b) Complete the following sentences by **circling** the correct answer.

(i) The sea anemone is a **producer** **consumer** because it eats other organisms.

1

(ii) The crab is the **predator** **prey** of the seagull.

1

(iii) The energy from the sun is used by the **seaweed** **chiton** to make food.

1

[Turn over

| Marks | KU | PS |
|-------|----|----|
| | | |
| | | |
| | | |
| | | |
| 3 | | |

13. Examples of ways in which objects may be damaged are shown below.

| | | |
|----------------------------------|--------------------------|---------------------|
| woodworm making holes in rafters | football breaking window | car dented in crash |
| ice bursting pipes | rats chewing cables | road tar melting |

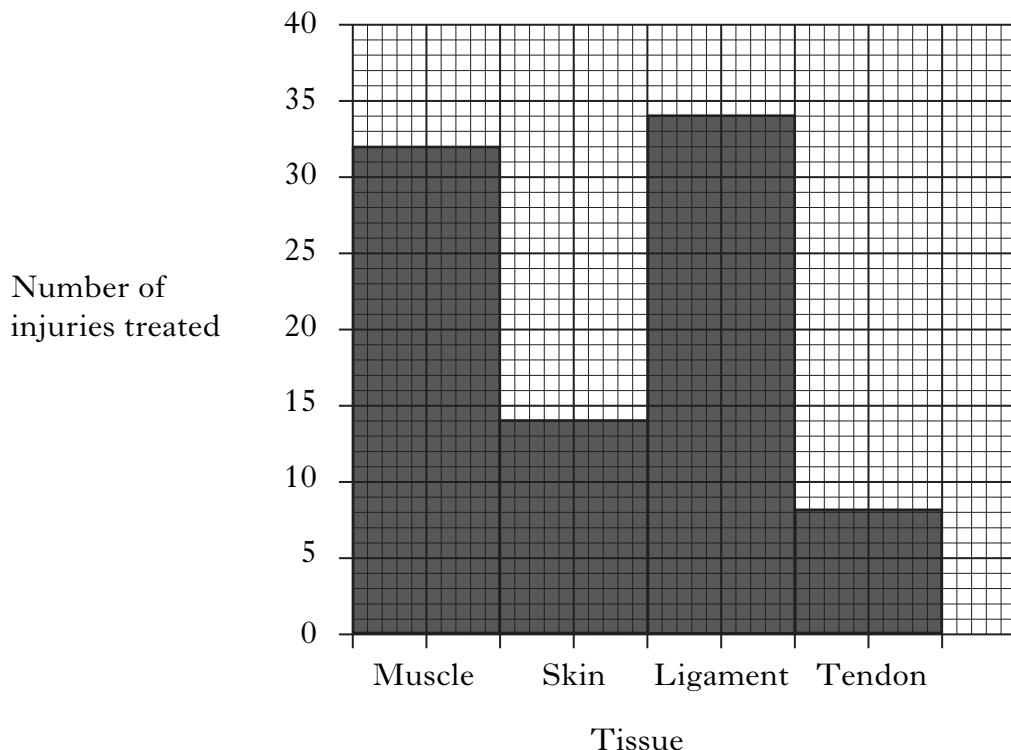
Complete the table below by showing how each type of damage could have been caused.

| <i>Damage caused by</i> | | |
|-------------------------|----------------------------------|---------------|
| <i>heat or cold</i> | <i>pests</i> | <i>impact</i> |
| | woodworm making holes in rafters | |
| | | |

| Marks | |
|-------|----|
| KU | PS |
| 1 | |
| 2 | |
| | |
| | |

14. A sports injury clinic recorded the number of different tissue injuries treated in one month.

The results are shown below.



- (a) What type of tissue was treated 34 times?

.....

1

- (b) What is the total number of muscle and tendon injuries treated?

Space for working

Answer

2

[Turn over

| Marks | KU | PS |
|-------|----|----|
| 2 | | |
| 1 | | |
| 1 | | |
| 1 | | |
| 1 | | |

15. (a) **Loft insulation** can be fitted in a house to save energy.

Give **two** other ways of insulating a house to save energy.

1

2
.....

- A Keep her computer on stand-by when she is not using it
 - B Increase the temperature setting of the central heating
 - C Have showers instead of baths
 - D Leave lights on in every room

Underline the correct answer.

- 16.** The wreck of a Spanish galleon was found by divers.

- (a) The divers found five gold coins.

The total mass of the five coins was 125 g.

Calculate the mass of **one** coin.

Space for working



Answer g

- (b) The divers also found six silver coins each weighing 13 g.

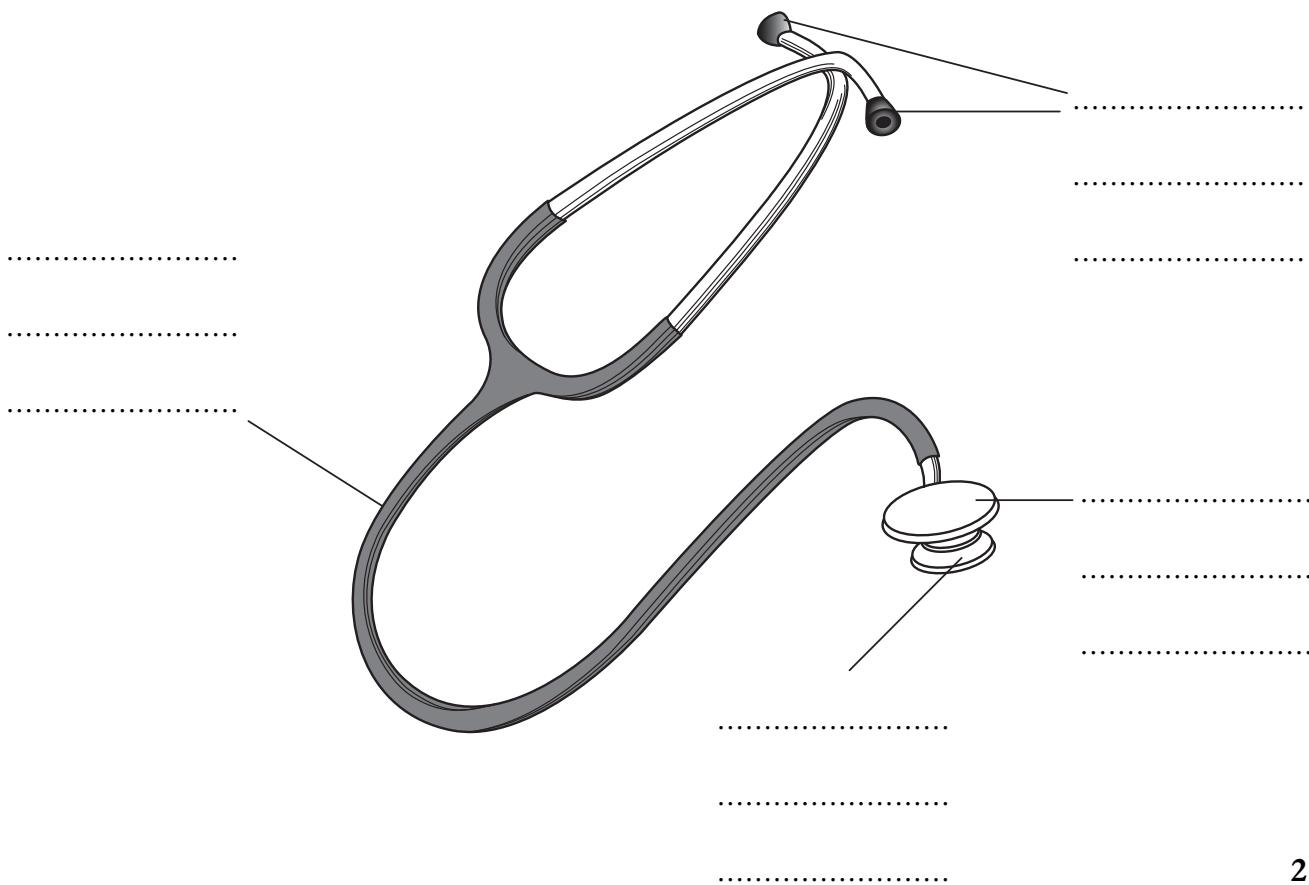
Calculate the **total** mass of the six silver coins.

Space for working

Answer g

17. Read the information below and use it to label the diagram.

A stethoscope is used by a doctor to listen to a patient's heart and lungs. The stethoscope has **plastic ear pieces** which fit into the doctor's ears. It has a **small open bell** which is used to listen to the heart and a **large closed bell** which is used to listen to the lungs. The doctor can turn the bells to use the one that he needs. The **flexible rubber tubing** carries sounds from the bells to the doctor's ears.



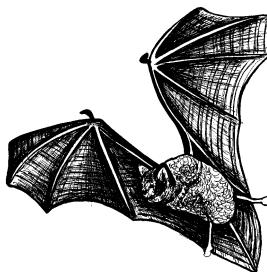
2

[Turn over

| Marks | | |
|-------|----|----|
| | KU | PS |
| 1 | | |
| 1 | | |
| 1 | | |
| 1 | | |
| 1 | | |

18. Read the passage and then answer the questions below.

Bats, like most mammals, have a body covered in fur and give birth to live young. They are different from other mammals, however, because bats are the only mammals which can fly. Their wings are made from webs of skin stretched between long bones, similar to the bones in your hand. The bat's thumb has a hook on the end which helps it to hang when it is not flying.



Bats are nocturnal. This means that they are active at night. During the day, they roost together, hanging upside down in dark sheltered places.

The most common bat in Scotland is the Pipistrelle. This bat is very small, with a body length of 38 mm, and weighs less than a 2p coin. It flies, twisting and diving, with sudden changes in direction. It snatches gnats, midges and moths from the air. One Pipistrelle can eat up to 3000 of these insects in one night. The Long-eared bat is also found in Scotland. It is bigger, with a body length of 50 mm. Its ears are as long as its body. It flies slowly, hovering among branches of trees, grabbing caterpillars, spiders and moths from the leaves.

- (a) What makes bats different from other mammals?

.....

1

- (b) What do bats do during the day?

.....

1

- (c) What length are the ears of a Long-eared bat?

..... mm

1

- (d) Which insect do both the Pipistrelle and the Long-eared bat eat?

.....

1

19. Different types of electrical appliances can be found in a modern kitchen. The power rating of a food blender is 600 watts. An electric can opener has a power rating of 100 watts. A breadmaker has a power rating of 500 watts and the power rating of an ice cube maker is 200 watts.

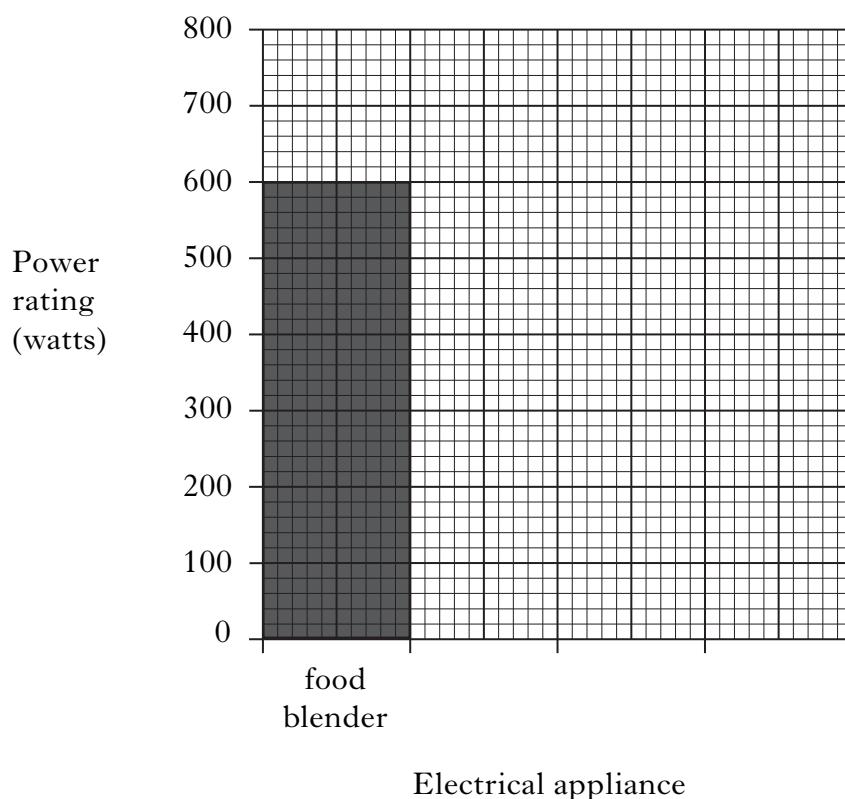
(a) Use this information to complete the table.

| <i>Electrical appliance</i> | <i>Power rating (watts)</i> |
|-----------------------------|-----------------------------|
| food blender | |
| | 100 |
| | |
| ice cube maker | |

2

(b) Use this information to complete the bar graph.

(Additional graph paper, if required, can be found on *Page twenty-one*)



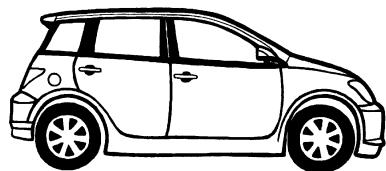
2

[Turn over

20. Some methods of protecting materials are shown below.

| | | |
|---------------------|-----------|-------------|
| water-proofing | painting | packaging |
| pesticide treatment | anodising | galvanising |

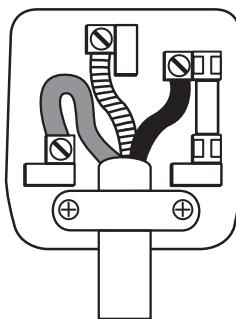
Which **two** methods are used to protect the steel body of a car against corrosion?



- 1
- 2

2

21. Here is a diagram of an electric plug.



- (a) The insulation on the three wires is colour coded.

Complete the table below.

| Colour of insulation | Name of wire |
|----------------------|--------------|
| green and yellow | earth |
| | live |
| blue | |

2

- (b) The earth wire is a safety device.

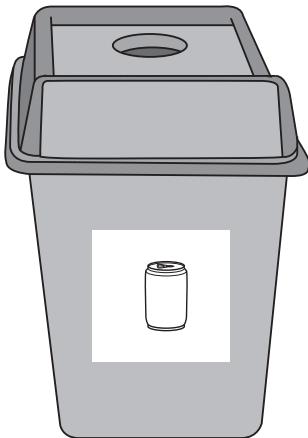
Name the other safety device in the plug.

.....

1

| Marks | RANKING | |
|-------|---------|----|
| | KU | PS |
| 1 | | |
| 1 | | |

22. In a school canteen pupils put their empty cans in recycling bins. The cans can be made from steel or aluminium.



- (a) One of the bins contains 150 metal cans. There are 80 aluminium cans. How many steel cans are there?

Space for working

Answer steel cans

- (b) Another bin contained 200 metal cans.
50% of the cans were made from aluminium.
How many aluminium cans were there?

Space for working

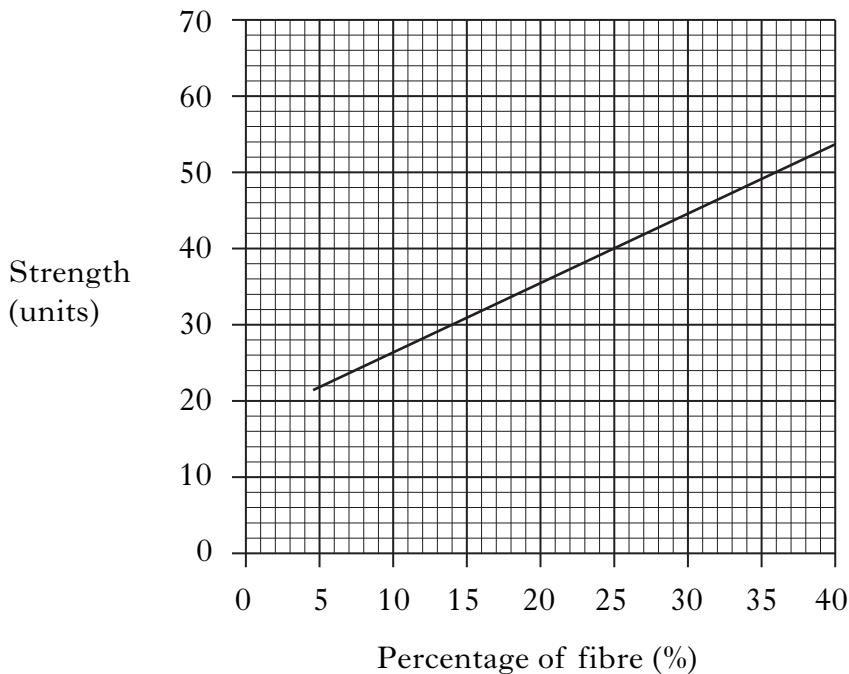
Answer aluminium cans

[Turn over

| Marks | RANKING | |
|-------|---------|----|
| | KU | PS |
| 1 | | |
| 1 | | |

23. Plaster is mixed with fibre to make plasterboard.

The graph below shows how the percentage of fibre in plasterboard affects its strength.



(a) What conclusion can be drawn from these results?

.....

1

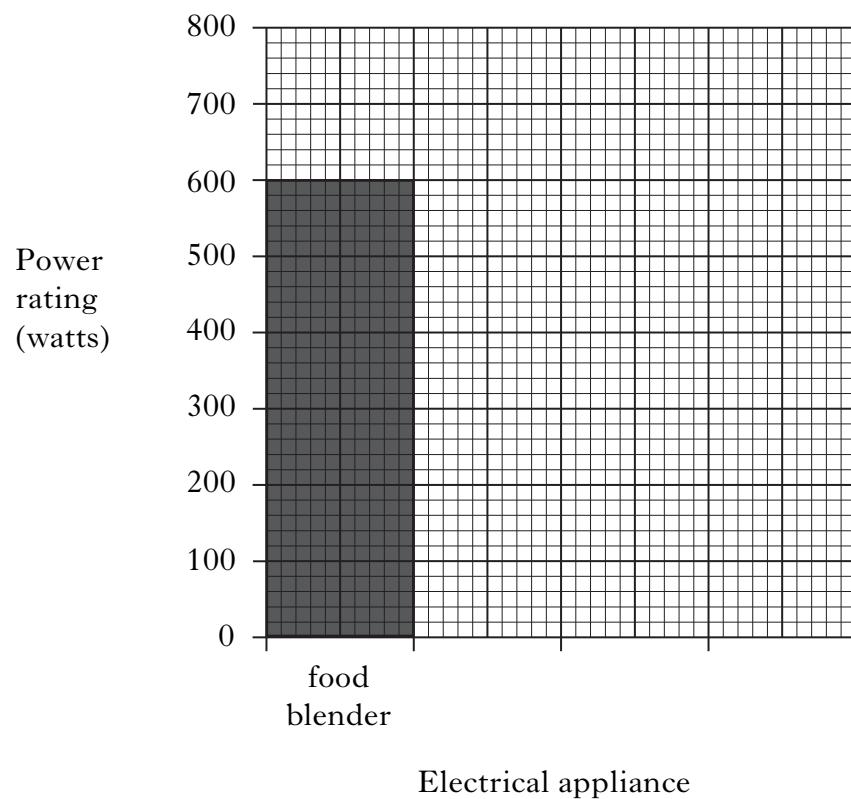
(b) What is the strength of plasterboard that contains 25% fibre?

units

1

[END OF QUESTION PAPER]

ADDITIONAL GRAPH PAPER FOR USE IN QUESTION 19(b)



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