

Sc

KEY STAGE

3

TIER

5–7

Science test

Paper 2 - Part B

First name _____

Last name _____

School _____

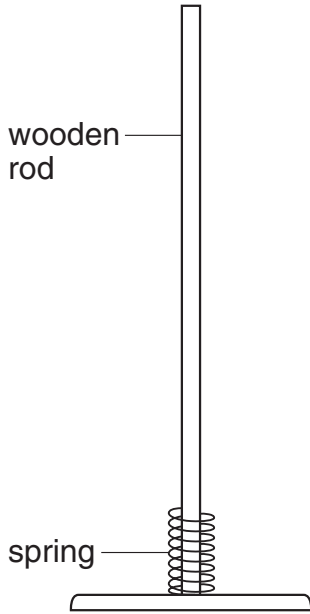
Remember

- The test is 1 hour long.
- You will need: pen, pencil, rubber, ruler, protractor and calculator.
- The test starts with easier questions.
- Try to answer all of the questions.
- The number of marks available for each question is given below the mark boxes in the margin. You should not write in this margin.
- If you are asked to plan an investigation, there will be space for you to write down your thoughts and ideas.
- Do not use any rough paper.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

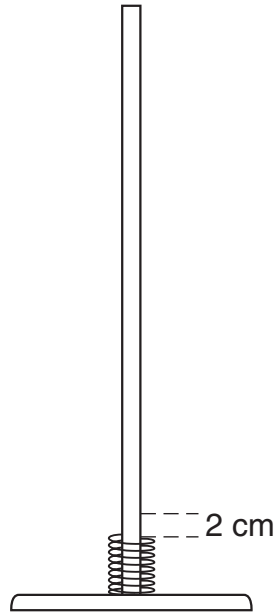
For marker's use only

TOTAL MARKS	
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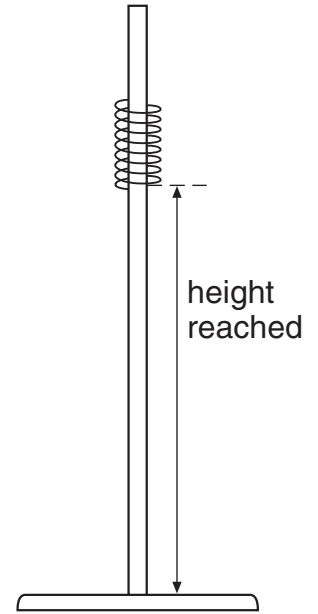
2. Jenny put a spring over a wooden rod.



She pressed the spring down 2 cm.

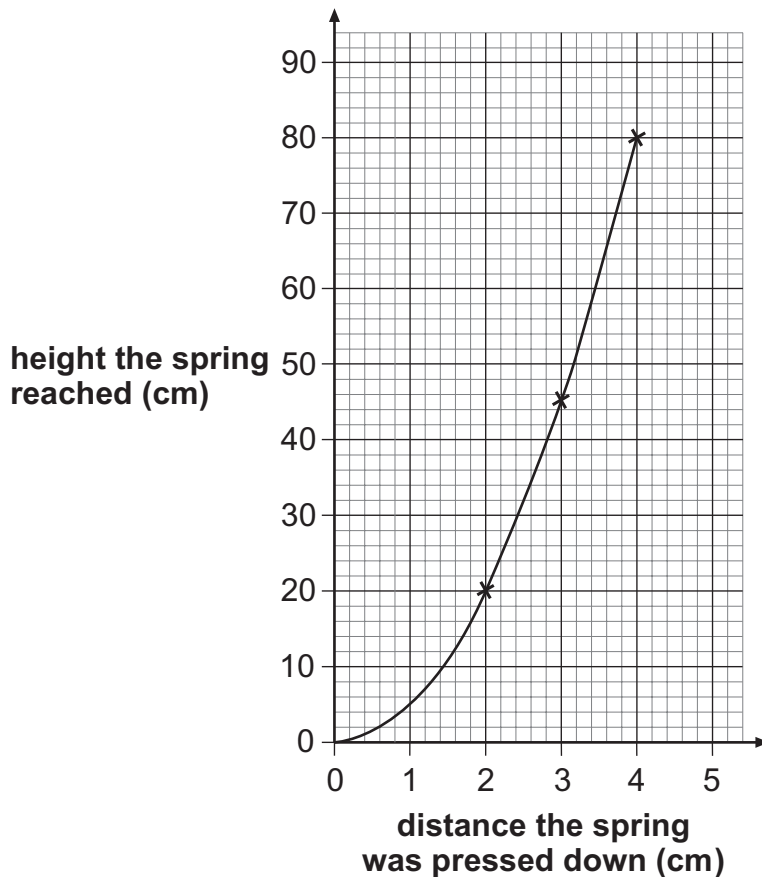


She let go of the spring and measured the height it reached.



not to scale

Jenny repeated her experiment. She pressed the spring down more each time. Her results are shown in the graph below.



(a) Use Jenny's graph to complete the table below.

distance the spring was pressed down (cm)	height the spring reached (cm)
2	
3	
4	

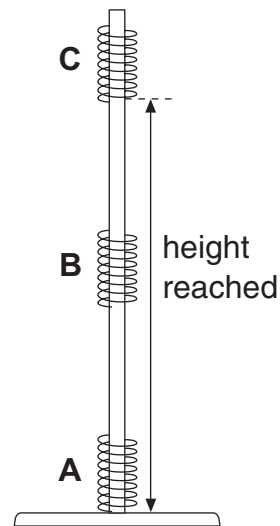
2a
1 mark

(b) Jenny said, 'If I double the distance I press the spring down, the height it reaches will also double'.

How do the results show she was wrong?

2b
1 mark

(c) This diagram shows the moving spring in three different positions.



Complete the sentences below by choosing words from the box.

You can use each word more than once.

most	some	least
-------------	-------------	--------------

(i) When the spring is moving at **B** it has _____ kinetic energy and _____ gravitational potential energy.

2ci
1 mark

(ii) When the spring reaches **C** it has _____ gravitational potential energy and _____ kinetic energy.

2cii
1 mark

(iii) When the spring stops at **A** it has _____ kinetic energy and _____ gravitational potential energy.

2ciii
1 mark

maximum 5 marks

4. Paul had four substances:

citric acid

copper sulphate

indigestion tablet

sugar

He dissolved 1 g of each substance in 20 cm³ of distilled water.
He used universal indicator to find the pH of each solution.

(a) (i) Sugar solution does **not** change the colour of green universal indicator.

What does this tell you about sugar solution?
Tick the correct box.

It is an acid.

It is an alkali.

It is neutral.

It is sweet.

(ii) Suggest the pH of citric acid.

(iii) Indigestion tablets neutralise acid in the stomach.

What does this tell you about indigestion tablets?

4ai
1 mark

4aii
1 mark

4aiii
1 mark

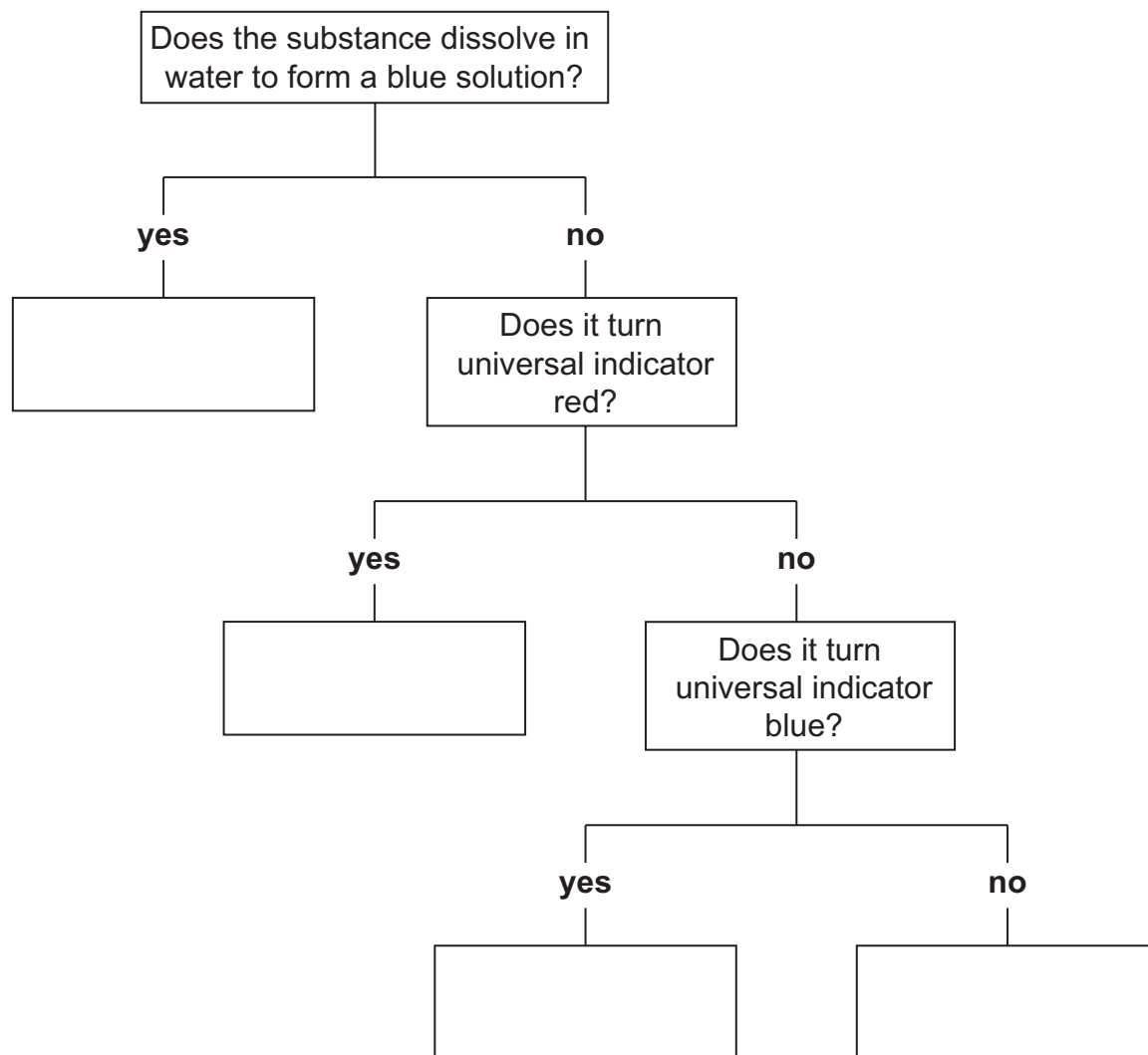
(b) Complete the flow chart below with the names of the substances in the boxes.

citric acid

copper sulphate

indigestion tablet

sugar



1 mark 4b

1 mark 4b

1 mark 4b

maximum 6 marks

6. The table below shows the mass of six nutrients in 100 cm³ of three types of milk.

nutrient	100 cm³ of human milk	100 cm³ of cows' milk	100 cm³ of milk made from baby-milk powder
carbohydrate (g)	7.4	5.0	7.2
fat (g)	4.2	3.7	3.6
protein (g)	1.1	3.5	1.5
calcium (mg)	35.0	120.0	49.0
iron (mg)	0.075	0.05	0.9
vitamin C (mg)	3.8	1.5	6.9

- (a) A scientist compared the three types of milk.

Why was it a fair comparison?



6a

1 mark

- (b) Both human milk and milk made from baby-milk powder contain more sugar than cows' milk.

Which data in the table supports this?



6b

1 mark

(c) Why do we need calcium in our diet?

6c
1 mark

(d) (i) Baby-milk powder is made from cows' milk.

What evidence is there in the table that iron is added when making baby-milk powder?

6di
1 mark

(ii) Why do we need iron in our diet?

6dii
1 mark

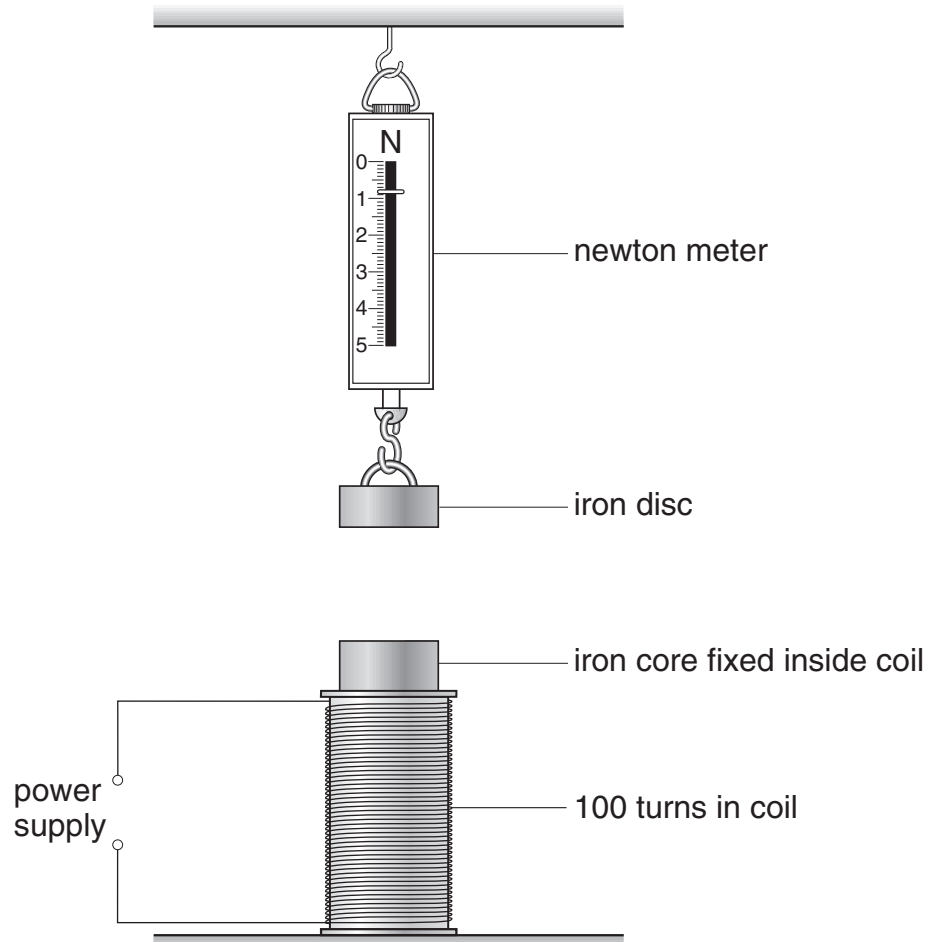
(e) A pupil said, 'There is more vitamin C than protein in human milk'.

How can you tell from the table that the pupil was wrong?

6e
1 mark

maximum 6 marks

8. Mary used the apparatus below to test the strength of an electromagnet. She used the reading on the newton meter to measure the force of the magnet on the iron disc.



- (a) Explain why the reading on the newton meter increases when a current passes through the coil.

8a

1 mark

8a

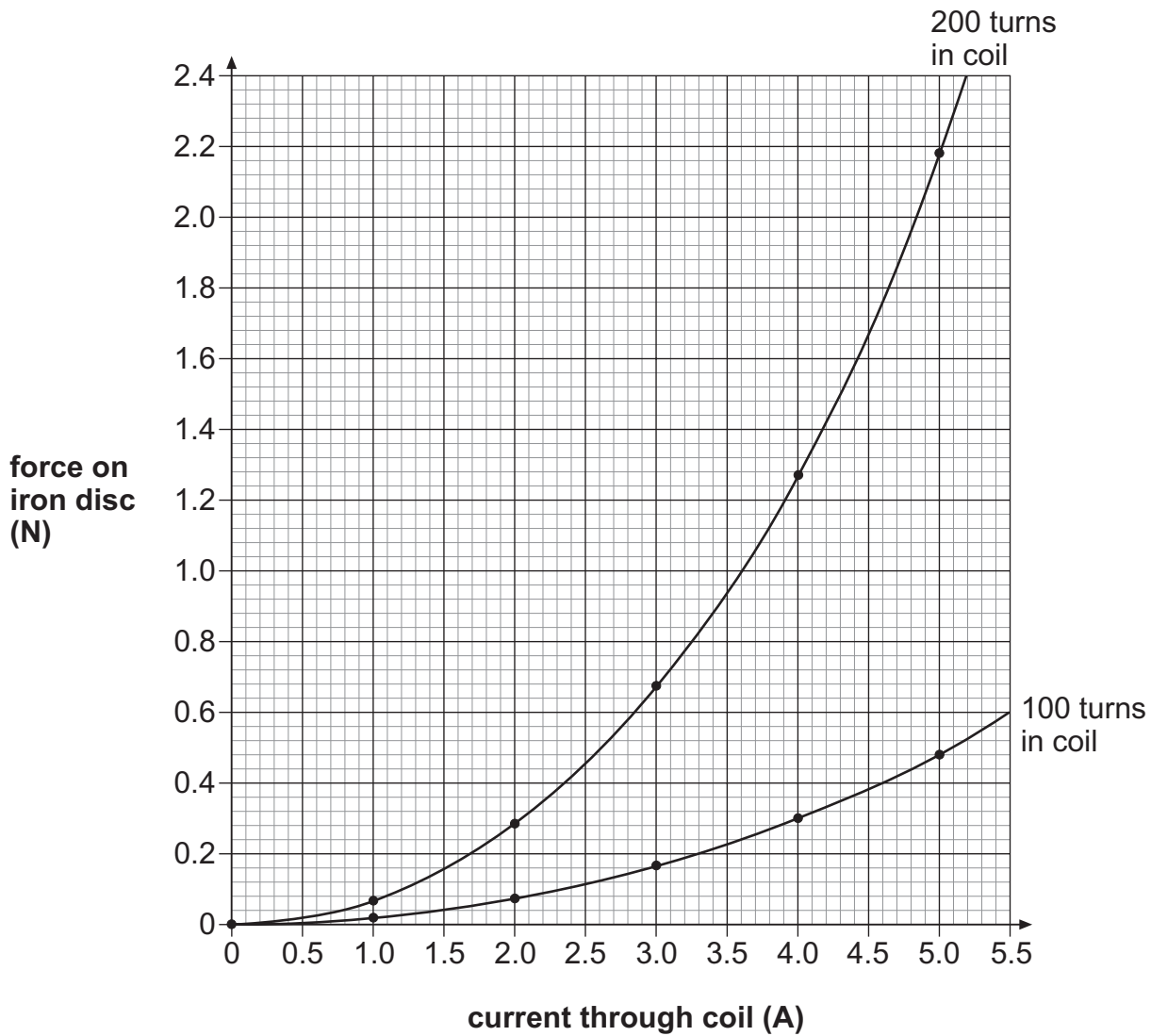
1 mark

- (b) When a current passes through the coil, some of the electrical energy is changed to thermal energy. What would happen to the coil if the current passing through it was too large?

8b

1 mark

- (c) Mary made two electromagnets, one with 100 turns of wire in the coil and one with 200 turns. She varied the current through the coil of each electromagnet. She measured the force of each electromagnet on the iron disc. The graph shows her results.



Write **two** conclusions that Mary could make from these results.

1. _____

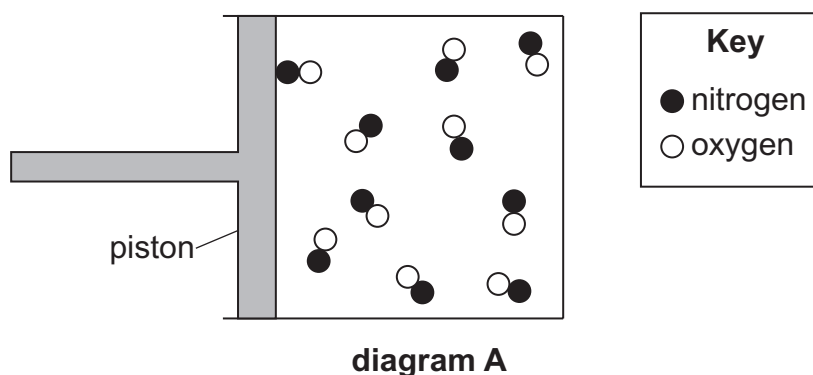
2. _____

1 mark

1 mark

maximum 5 marks

10. Diagram **A** represents a gas in a container.
The gas can be compressed by moving the piston to the right.



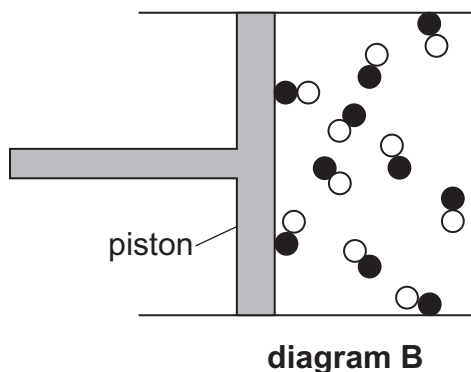
- (a) (i) How can you tell that the substance in the container is a gas?

10ai
1 mark

- (ii) How can you tell from the diagram that the gas is pure?

10aai
1 mark

- (b) The piston is moved to the right as shown in diagram **B**.



How can you tell, from diagram **B**, that the pressure of the gas has increased?

10b
1 mark

- (c) Diagram **C** shows what happened to the molecules after the gas was compressed more.

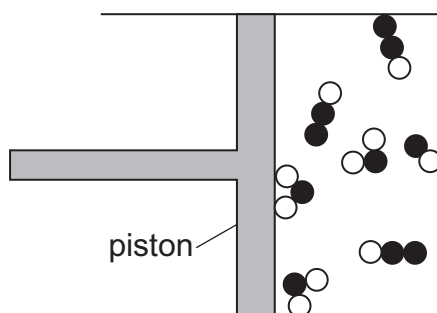


diagram C

- (i) How can you tell that a chemical reaction happened when the gas was compressed?

10ci
1 mark

- (ii) The mass of the gas in both diagrams **B** and **C** was 0.3 g.

Why did the mass of the gas **not** change when it was compressed?

10cii
1 mark

- (iii) Complete the table below with the correct chemical formula of each substance. Use the key to help you.

substance	formula
●○	
●●○	
●○	

Key
● nitrogen
○ oxygen

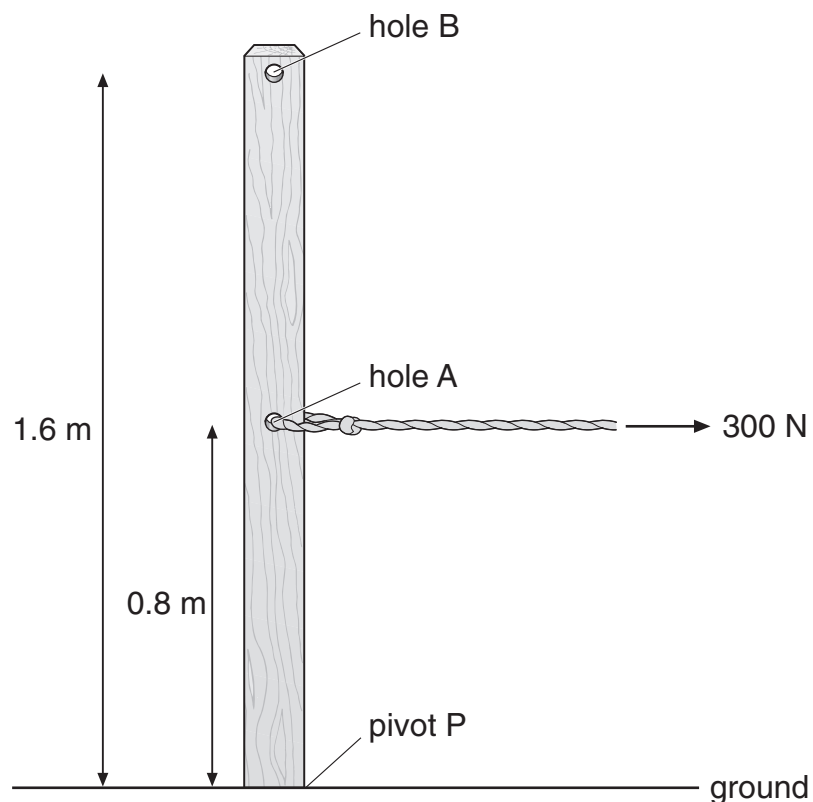
10ciii
1 mark

- (iv) What is the **name** of the substance represented by the symbol ●○ ?

10civ
1 mark

maximum 7 marks

12. A builder tried to remove a wooden post from the ground by pulling with a rope.



- (a) (i) The builder attached a rope to hole A, 0.8 m above the ground. He pulled with a horizontal force of 300 N.

Calculate the turning moment about the pivot P.
Give the unit.

- (ii) He then attached a rope to hole B, 1.6 m above the ground. He pulled with a horizontal force.

What force would produce the same turning moment as before?

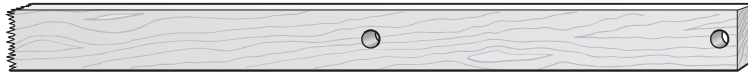
 N

12ai
1 mark

12ai
1 mark

12aii
1 mark

(b) The post breaks off and falls on the ground as shown.



The weight of the broken post is 120 N.
The area in contact with the ground is 0.2 m².

Calculate the pressure of the broken post on the ground.
Give the unit.

12b
1 mark

12b
1 mark

END OF TEST

maximum 5 marks