

Please check the examination details below before entering your candidate information

Candidate surname	Other names
Pearson Edexcel International Award in Lower Secondary	Centre Number
Time 1 hour 20 minutes	Candidate Number
	Paper reference
	LSC11/01
<h1 style="margin: 0;">Science</h1> <h2 style="margin: 0;">Achievement Test</h2>	
You must have: Ruler	Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 80.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- Candidates may use a calculator.

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.
- Good luck with your examination.

Turn over ►



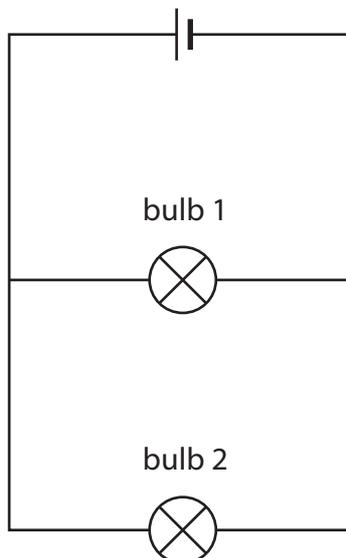
SECTION A

Answer ALL questions.

For Questions 1–5 put a cross in one box to indicate your answer.

If you change your mind, put a line through the box and then put a cross in another box .

- 1 The diagram shows two identical bulbs, connected in parallel.



Which statement is correct?

- A the current flowing through bulb 1 is bigger than the current flowing through bulb 2
- B the current flowing through bulb 2 is bigger than the current flowing through bulb 1
- C the voltage across bulb 1 is bigger than the voltage across bulb 2
- D the voltage across both bulbs is the same

(Total for Question 1 = 1 mark)

- 2 The chemical formula for one molecule of carbon dioxide is CO_2

How many atoms are in one molecule of carbon dioxide?

- A 1
- B 2
- C 3
- D 4

(Total for Question 2 = 1 mark)

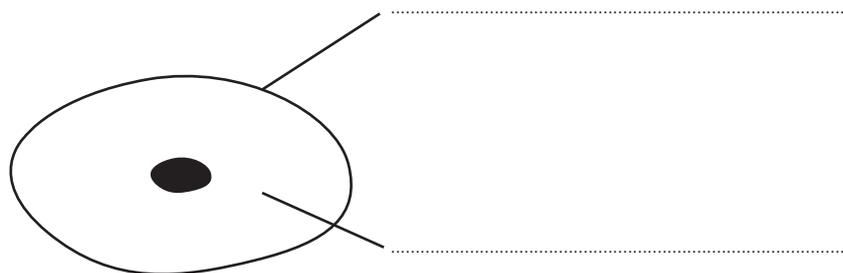


5 Which best describes an artery?

- A it has thick walls and carries oxygenated blood at low pressure
- B it has thick walls and carries oxygenated blood at high pressure
- C it has thin walls and carries oxygenated blood at low pressure
- D it has thin walls and carries oxygenated blood at high pressure

(Total for Question 5 = 1 mark)

6 The diagram shows a typical animal cell.



Complete the **two** labels using words from the box.

cell membrane

cell wall

chloroplast

cytoplasm

nucleus

vacuole

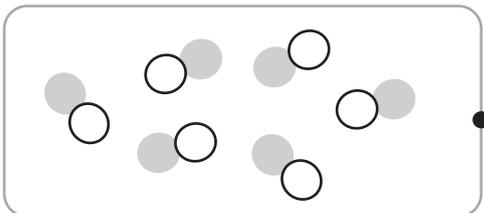
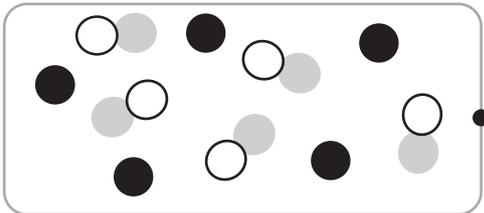
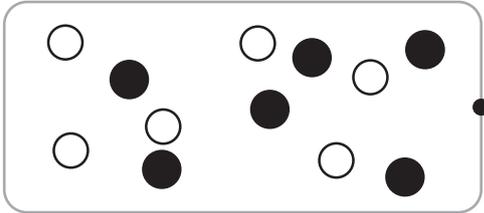
(Total for Question 6 = 2 marks)



7 Substances can be described as elements, mixtures or compounds. These can be represented by diagrams of the particles they contain.

Draw **one** straight line from each diagram to the type of substance it represents.

Diagram



Type of substance

a single compound

a mixture of two elements

a mixture containing an element and a compound

a mixture of two compounds

(Total for Question 7 = 2 marks)



8 When sodium metal reacts with water, sodium hydroxide solution and a gas are produced.

(a) Give the name of the gas produced in this reaction.

(1)

(b) Sodium hydroxide solution is an alkali.

What is the likely pH value of the sodium hydroxide solution?

(1)

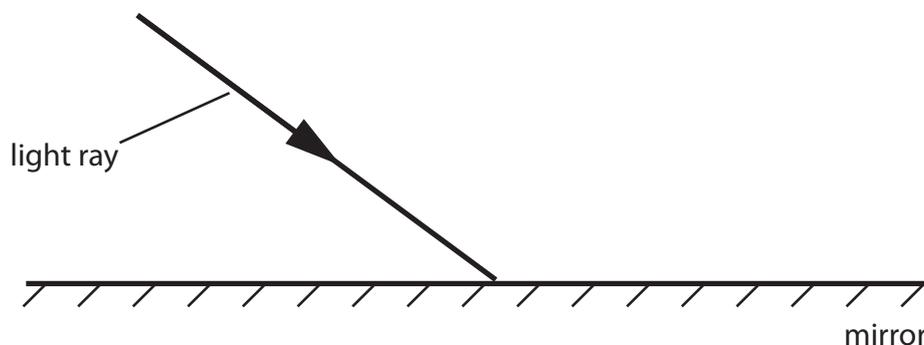
(c) The reaction between sodium and water is exothermic.

State what is meant by an exothermic reaction.

(1)

(Total for Question 8 = 3 marks)

9 The diagram shows a light ray hitting the surface of a mirror.



Complete the diagram by adding the normal and the reflected ray of light.

(Total for Question 9 = 3 marks)



10 (a) The table contains information about the structure of different microorganisms.

Complete the table by adding ticks (✓) or crosses (✗) to show the structure of a typical virus.

Microorganism	Cell wall	Mitochondria	Nucleus
bacteria	✓	✗	✗
fungi	✓	✓	✓
virus			

(1)

(b) Give one reason why a virus may **not** be classed as a living organism.

(1)

(Total for Question 10 = 2 marks)

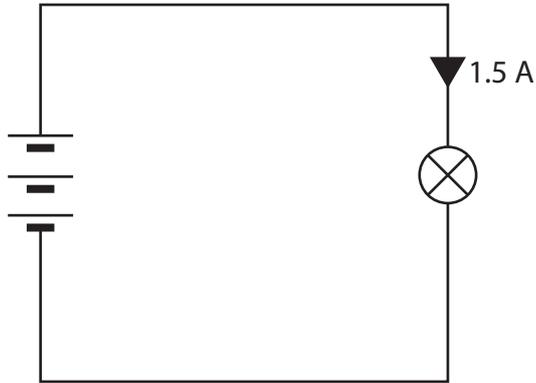


11 (a) What are the units of electrical resistance?

(1)

(b) Each cell in the diagram has a voltage of 1.5V.

The current flowing in the circuit is 1.5 A.



Calculate the value of the resistance of the bulb.

Use the equation

$$\text{voltage (V)} = \text{current (I)} \times \text{resistance (R)}$$

(2)

resistance =

(Total for Question 11 = 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



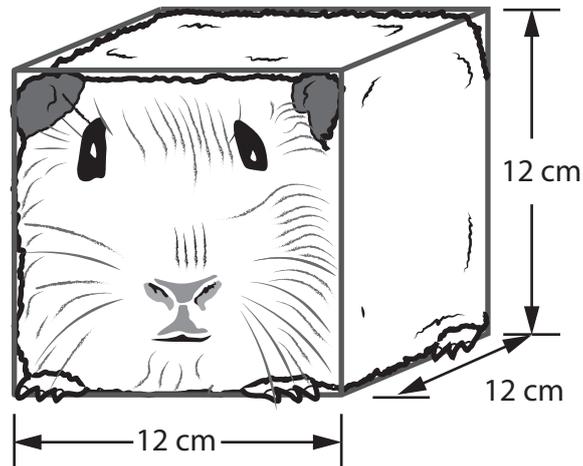
For Questions 12–16 put a cross in one box to indicate your answer.

If you change your mind, put a line through the box and then put a cross in another box .

- 12 In animals the surface area to volume ratio is important in maintaining body temperature.

The diagram shows the body of a guinea pig being represented as a cube.

The surface area and volume of the cube are the same as those of the guinea pig.



What is the surface area to volume ratio for the guinea pig?

- A 0.5 : 1
- B 1.0 : 1
- C 1.5 : 1
- D 2.0 : 1

(Total for Question 12 = 1 mark)



13 Which row of the table shows correctly a ceramic material and a polymer?

- A
- B
- C
- D

	Ceramic material	Polymer
A	glass	poly(chloroethene) (PVC)
B	pottery	MDF
C	GRP	rubber
D	porcelain	glass

(Total for Question 13 = 1 mark)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



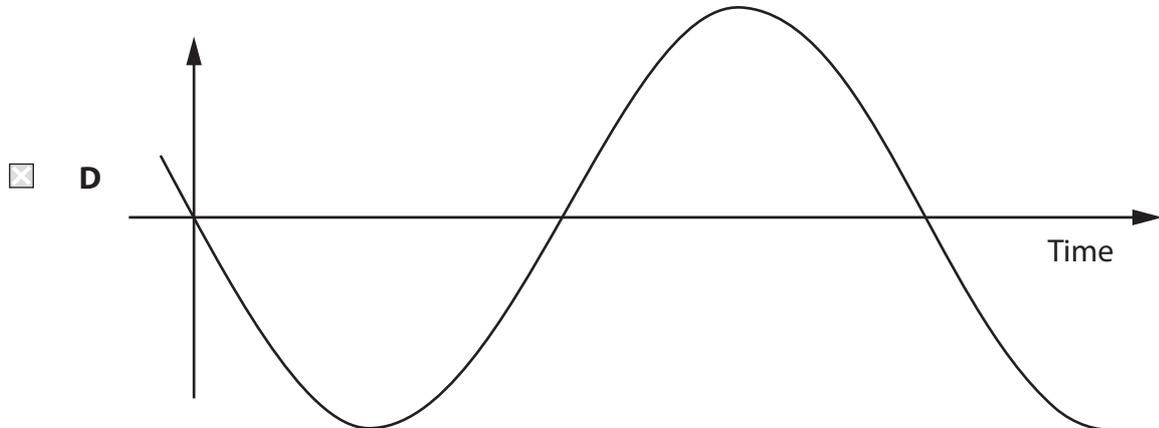
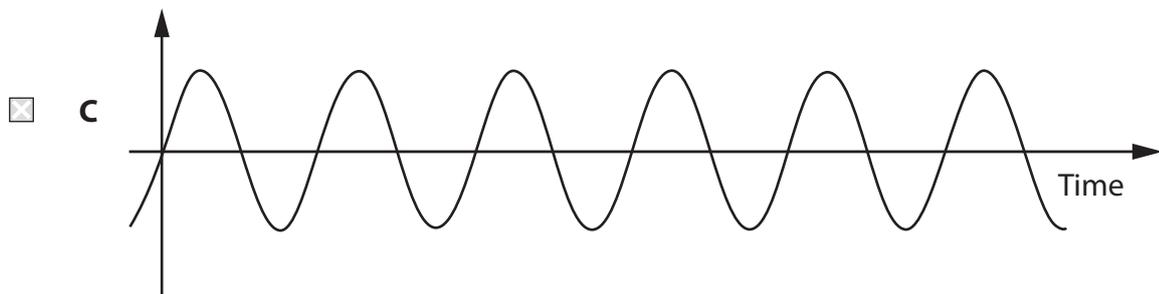
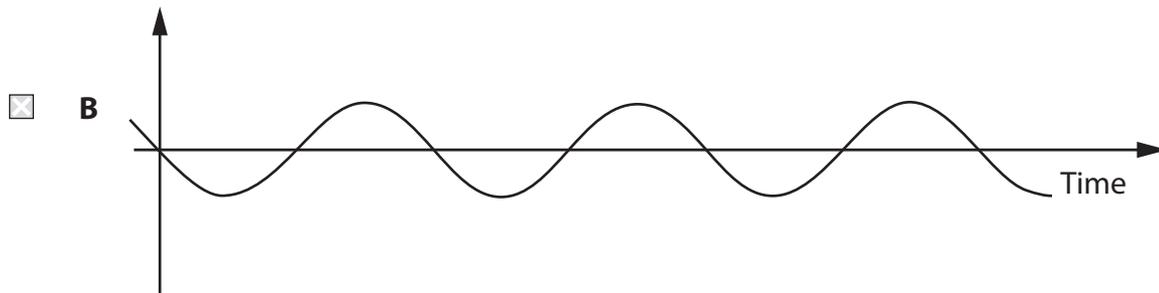
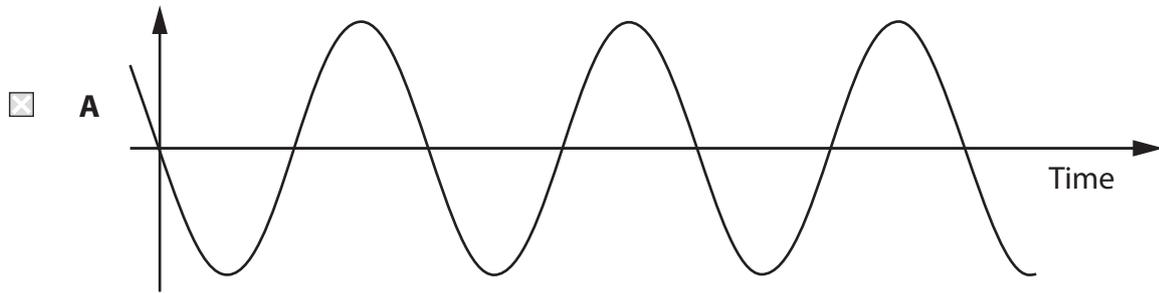
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

14 Which of the following sound waves has the **highest** pitch?

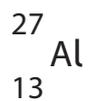
The scales used on each diagram are the same.



(Total for Question 14 = 1 mark)



15 An atom of aluminium can be represented by the symbol



How many neutrons are there in this atom of aluminium?

- A 13
- B 14
- C 27
- D 40

(Total for Question 15 = 1 mark)

16 The turning effect of a force is called a *moment*.
Which is the correct unit for a *moment*?

- A N
- B N/m
- C Nm
- D Nm²

(Total for Question 16 = 1 mark)



17 The diagram shows the forces acting on a parachutist.



The words in the box can be used to describe forces.

air resistance	balanced	contact	gravity
non-contact	resultant	terminal	weight

Use words from the box to complete each sentence.

Gravity is an example of a force.

The upward force on the parachutist is caused by

When the parachute reaches terminal velocity the force is zero.

(Total for Question 17 = 3 marks)



18 Tick (✓) one box in each row of the table to show the relative charge of each of the particles that are found in atoms.

Particle	relative charge		
	+1	0	-1
electron			
neutron			
proton			

(Total for Question 18 = 1 mark)

19 Air is a mixture of different gases.

The box gives the name of some gases.

argon carbon dioxide hydrogen nitrogen oxygen

Complete the sentence below using gases from the box.

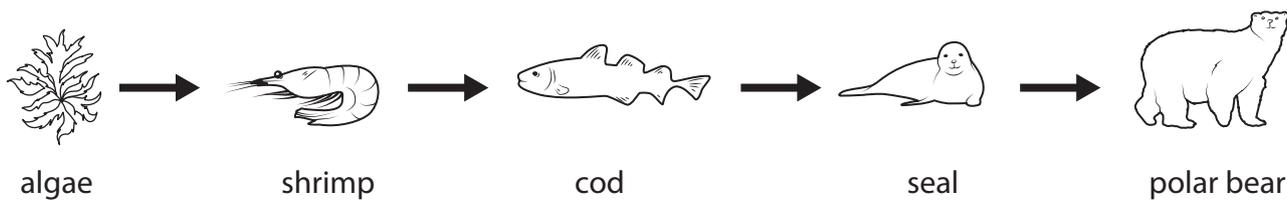
The greatest proportion of air is whilst

approximately 21% of the air is

(Total for Question 19 = 2 marks)



20 The diagram shows a food chain.



(a) Different terms are applied to organisms in a food chain.

Draw **one** straight line from each term to the name of the organism that it applies to.

(2)

Term	Organism it applies to
primary consumer	algae
producer	cod
tertiary consumer	seal
	shrimp

(b) Polar bears live in cold, icy, snowy, Arctic conditions.

State one way that the polar bear is adapted to its habitat.

(1)

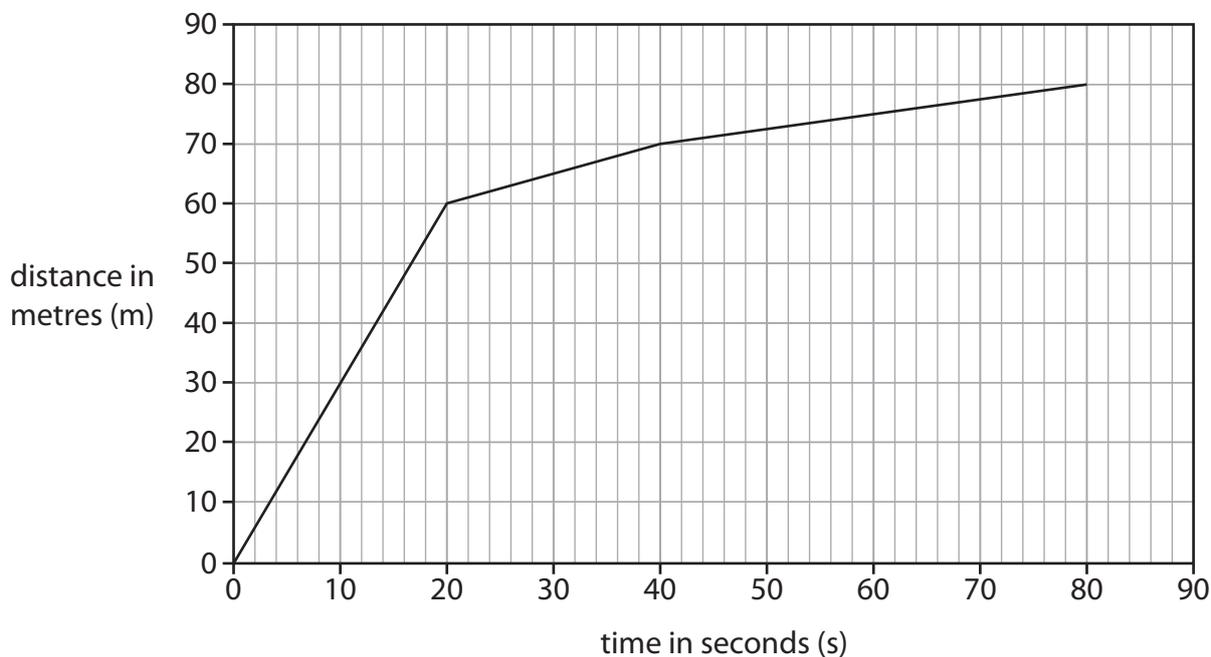
(Total for Question 20 = 3 marks)



21 The diagram shows the distance-time graph for a student as they walk between two shops.

The student walks at different speeds during different sections of their journey.

The shops are 80m apart.



Draw **one** straight line from each speed to its correct value.

Speed

Value

the average speed for the whole 80 s journey between the two shops

the fastest speed the student walks at

0.8 m/s

1.0 m/s

2.5 m/s

3.0 m/s

(Total for Question 21 = 2 marks)



DO NOT WRITE IN THIS AREA

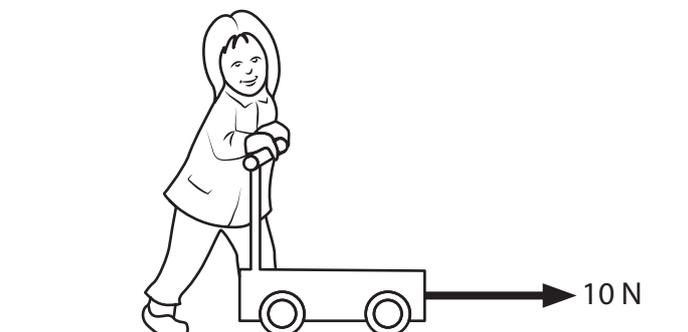
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

22 A young child pushes a cart with a forward force of 10 N. This is shown in the diagram.

The cart does not move because of friction acting on the cart.

The cart has a mass of 2 kg.



Draw **one** straight line from each force to its correct size and direction.

Force

Size and direction of the force

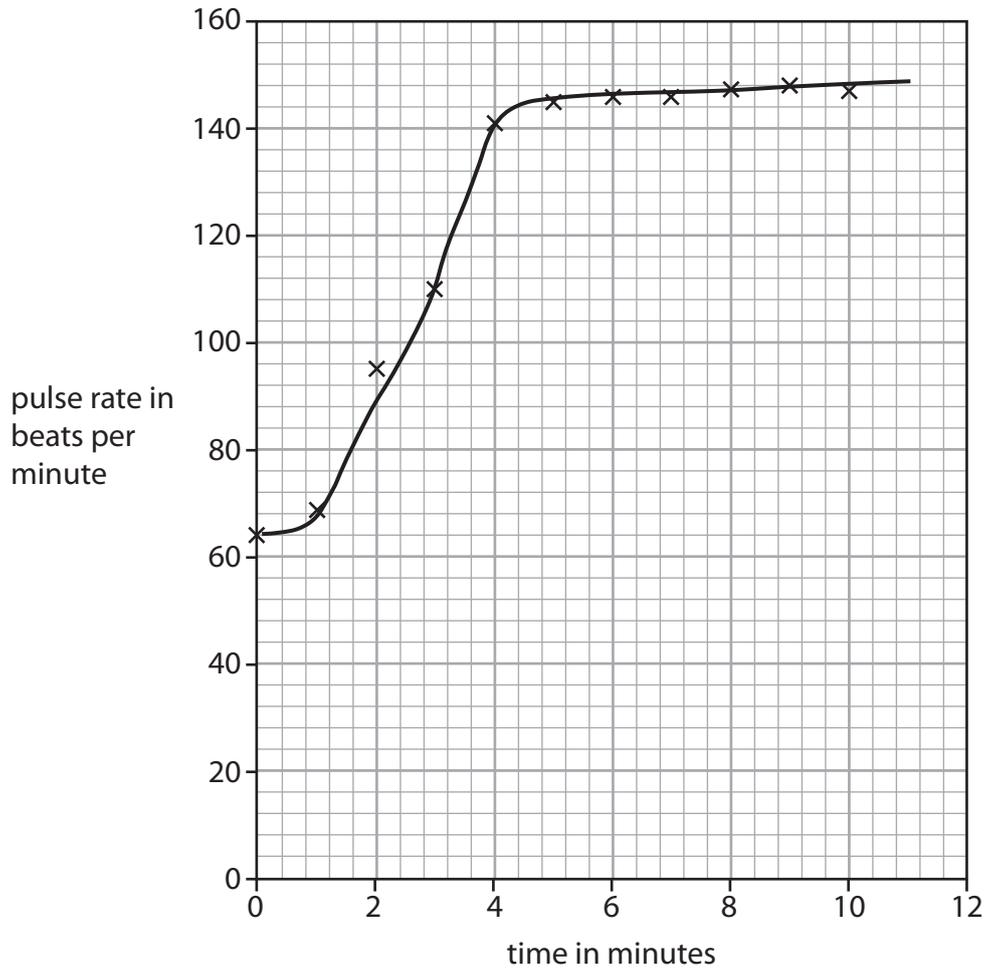
friction force acting on the cart	0 N
resultant force acting on the cart	10 N →
	20 N →
	10 N ←
	20 N ←

(Total for Question 22 = 2 marks)



23 A student's pulse rate when resting is 64 beats per minute.

The graph shows what happens to the student's pulse rate when they start running.



Explain why the student's pulse rate changes as shown in the graph.

.....

.....

.....

.....

(Total for Question 23 = 2 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



For Questions 24–28 put a cross in one box to indicate your answer.

If you change your mind, put a line through the box and then put a cross in another box .

24 Which pair of diseases could both be treated effectively with antibiotics?

- A athlete's foot and flu
- B cholera and salmonella
- C flu and scurvy
- D malaria and rickets

(Total for Question 24 = 1 mark)

25 An acid reacts with a metal carbonate.

Which is the correct general equation for this reaction?

- A acid + metal carbonate → salt + carbon dioxide
- B acid + metal carbonate → salt + hydrogen + carbon dioxide
- C acid + metal carbonate → salt + water
- D acid + metal carbonate → salt + water + carbon dioxide

(Total for Question 25 = 1 mark)

26 The statements describe what might happen when two electrically charged objects are brought close together.

Which statement is true?

- A the objects will attract each other if the charge on each object is positive
- B the objects will attract each other if the charge on each object is negative
- C the objects will attract each other if one object is positive and the other is negative
- D the objects will neither attract nor repel each other

(Total for Question 26 = 1 mark)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



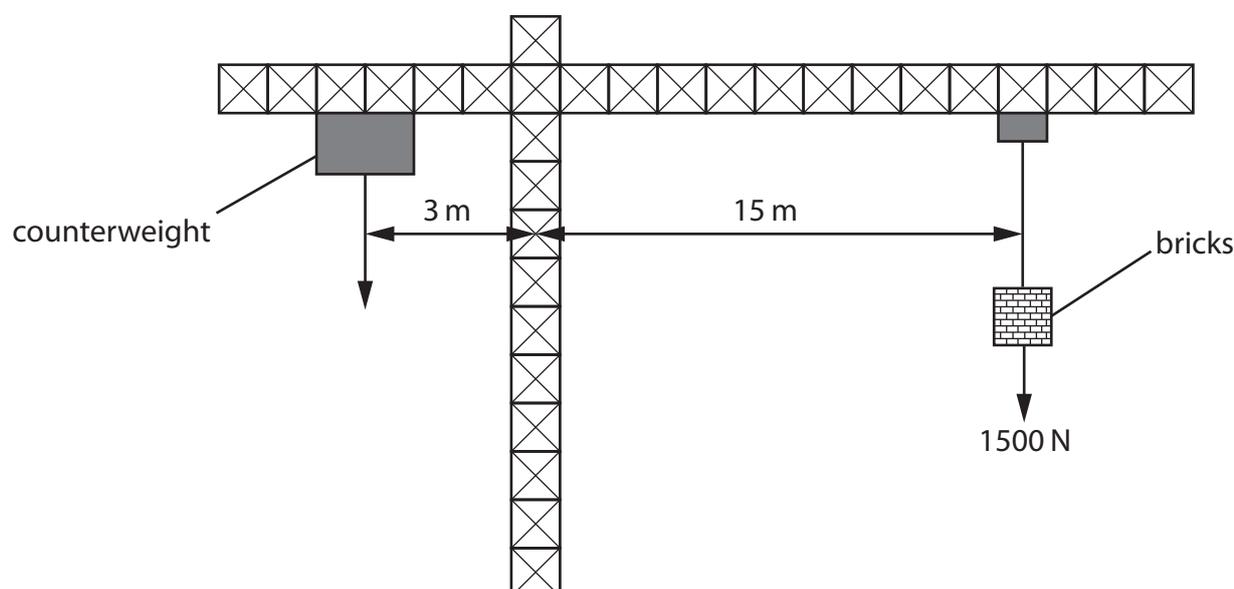
27 Which of the following gives the correct equation for aerobic respiration?

- A $C_6H_{12}O_6 + 6CO_2 \rightarrow 6O_2 + 6H_2O$
- B $C_6H_{12}O_6 + 6O_2 \rightarrow CO_2 + 6H_2O$
- C $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
- D $C_6H_{12}O_6 + O_2 \rightarrow 6CO_2 + 6H_2O$

(Total for Question 27 = 1 mark)

28 A crane is used to lift some bricks. The bricks have a weight of 1500 N.

A counterweight is used to balance the weight of the bricks.



The diagram shows the position of the bricks and the counterweight.

What weight does the counterweight need to be to balance the weight of the bricks?

- A 500 N
- B 4500 N
- C 7500 N
- D 22 500 N

(Total for Question 28 = 1 mark)



29 A climber has a weight of 690 N.

They climb a cliff that is 10 m high.

Calculate the work done by the climber. Include the unit in your answer.

Use the equation

$$\text{work done} = \text{force} \times \text{distance moved}$$

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

work done = unit

(Total for Question 29 = 2 marks)

30 Eating a **balanced diet** is an important part of maintaining good health.

(a) A balanced diet must contain some protein.

Give **two** other components of a balanced diet.

(2)

1

2

(b) Describe the difference between starvation and malnutrition.

(2)

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

(Total for Question 30 = 4 marks)



31 (a) Iron oxide reacts with carbon to form iron.

State the type of chemical reaction that iron oxide undergoes as it becomes iron.

(1)

(b) The relative reactivity of metals can be found using displacement reactions between metals and metal oxides.

When iron oxide is heated with lead metal no reaction occurs.

When iron oxide is heated with metal X, iron metal is displaced.

Describe what this shows about the relative reactivity of the metals iron, lead and X.

(2)

(Total for Question 31 = 3 marks)



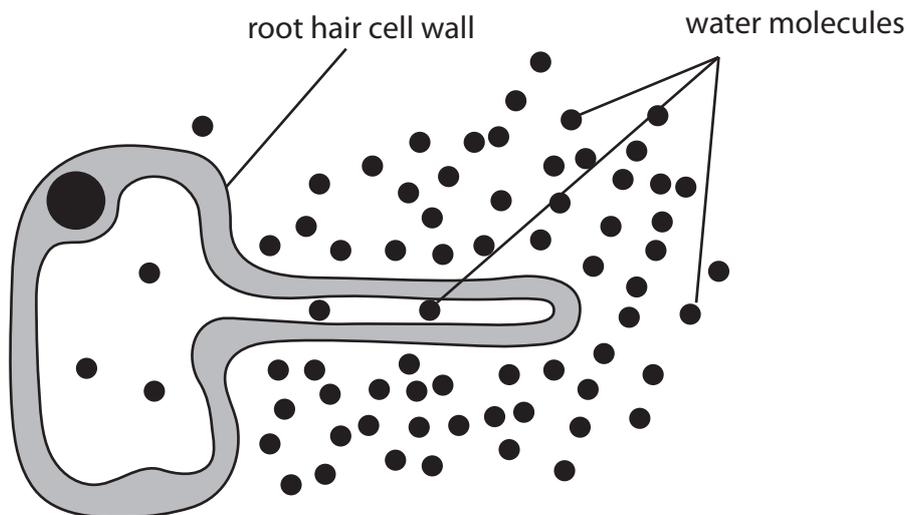
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

32 Water can diffuse through the wall of a root hair cell.

The diagram shows a root hair cell.



Explain the direction of diffusion of the water molecules through the wall of a root hair cell.

.....

.....

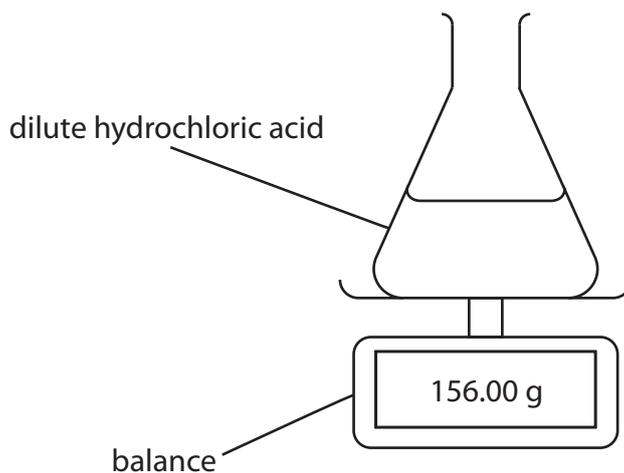
.....

.....

(Total for Question 32 = 2 marks)



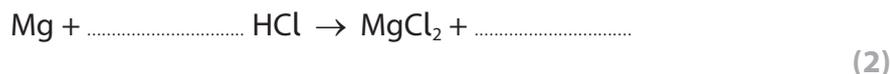
33 A student places a flask containing dilute hydrochloric acid on a balance.



The reading on the balance is 156.00 g.

The student then adds 5.00 g of magnesium to the acid in the flask and a chemical reaction takes place. The reaction produces a gas.

(a) Complete the chemical equation for the reaction that takes place.



(b) When the reaction stops, the reading on the balance is 160.78 g.

Calculate the mass of gas that is produced during this reaction. (2)

.....

.....

.....

.....

mass of gas = g

(Total for Question 33 = 4 marks)

TOTAL FOR SECTION A = 60 MARKS

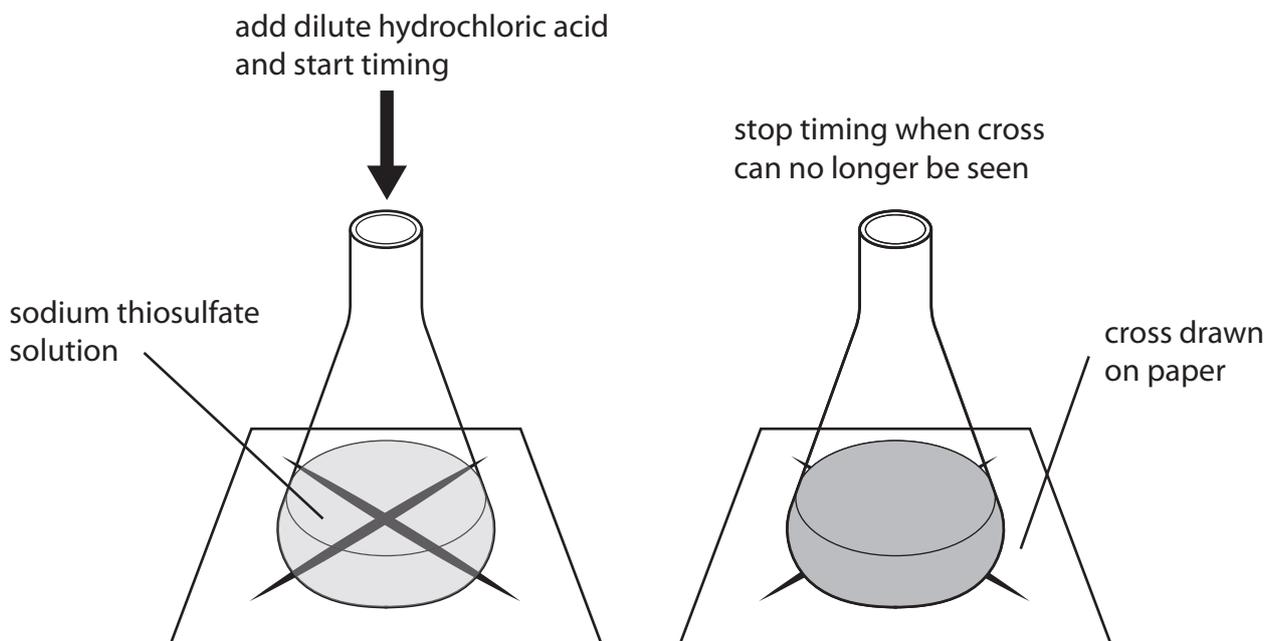


SECTION B

Answer ALL questions. Write your answers in the spaces provided.

- 34 When dilute hydrochloric acid is added to sodium thiosulfate solution a chemical reaction takes place and the solution becomes cloudy.

A student investigates how the temperature of the acid affects the rate of this reaction. The diagram shows the method the student uses.



The student starts a stop clock when the dilute acid is added and stops it when the solution is so cloudy that the cross on the paper can no longer be seen.

The student repeats the experiment using dilute hydrochloric acid at different temperatures.

25 cm^3 of dilute hydrochloric acid and 25 cm^3 of sodium thiosulfate solution are used each time.

- (a) (i) Name the piece of equipment the student should use to measure the volume of the dilute hydrochloric acid.

(1)



(ii) This symbol is on the bottle of dilute hydrochloric acid.



Give the meaning of this symbol.

(1)

(iii) State one safety precaution the student should take when doing this investigation.

(1)

(b) The table shows some of the variables that could affect this investigation.

Complete the table by placing a tick (✓) in the correct column beside each variable to identify it as either a control variable, a dependent variable or an independent variable.

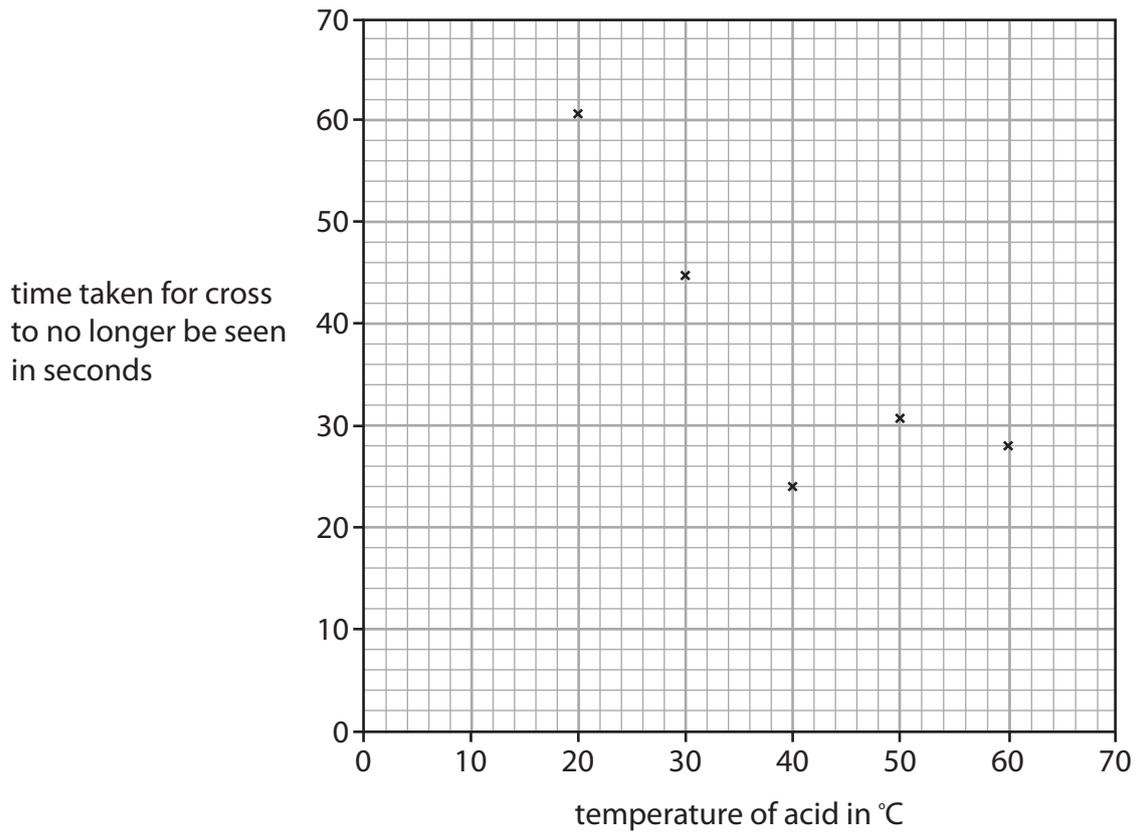
The first one has been done for you.

(3)

Variable	Control variable	Dependent variable	Independent variable
concentration of sodium thiosulfate solution	✓		
volume of hydrochloric acid and sodium thiosulfate			
temperature of dilute hydrochloric acid			
time taken for cross to no longer be seen			



(c) The student uses their results to produce this graph.



(i) One of the results is anomalous.

Circle the anomalous result.

(1)

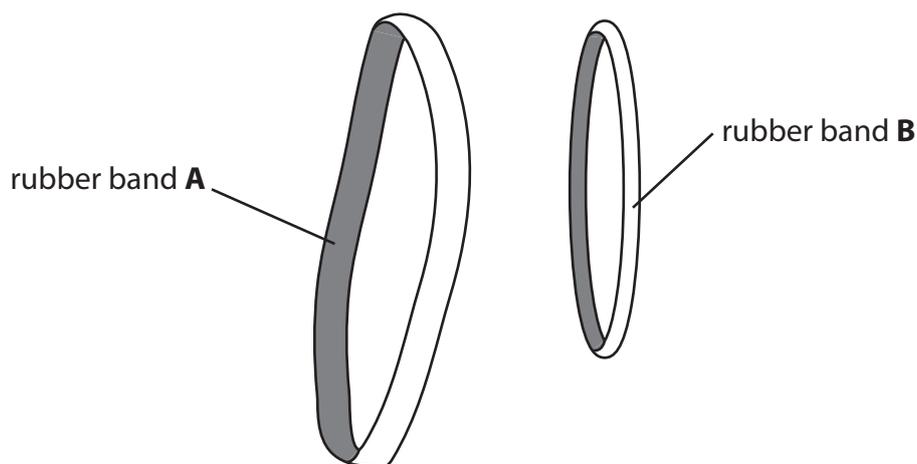
(ii) Draw a curve of best fit to complete the graph.

(1)

(Total for Question 34 = 8 marks)

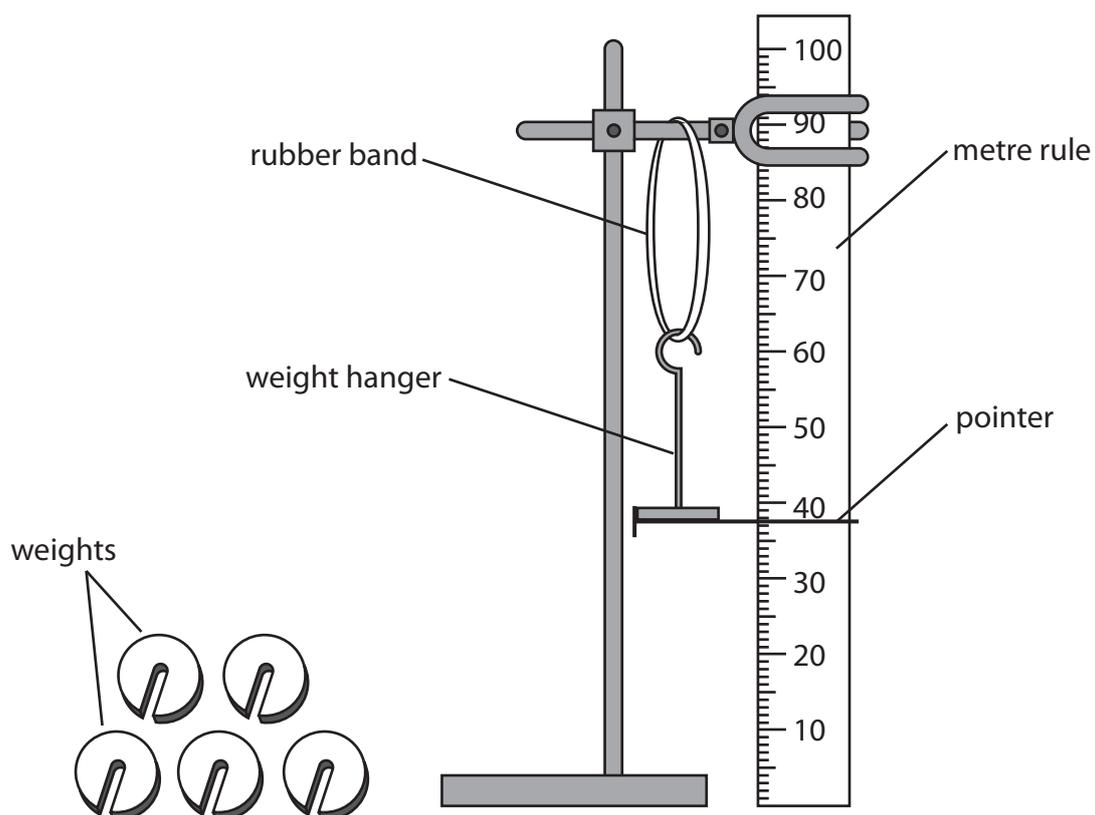


35 A student has two different rubber bands, **A** and **B**.



The diagram shows the apparatus the student uses to investigate how much the rubber bands stretch when a weight is hung from them.

Each time a weight is added to the hanger, the student records the position of the pointer using the scale on the metre rule and works out how much the rubber band has stretched.



The table shows the student's results.

Number of weights	Rubber Band A		Rubber Band B	
	Position of pointer	Stretch in cm	Position of pointer	Stretch in cm
0	40.0	0.0	65.0	0.0
1	37.5	2.5	63.0
2	35.0	5.0	61.0	4.0
3	32.5	7.5	59.0	6.0
4	30.0	10.0	56.0	9.0
5	27.5	12.5	52.0	13.0
6	25.0	15.0	47.0	18.0

(a) Complete the table by calculating the stretch of rubber band **B** with one weight added.

(1)

(b) Describe the pattern shown by the results for rubber band **A**.

(2)

.....

.....

.....

.....



(c) Before doing the investigation, the student makes this prediction:

*“As each weight is added rubber band **B** will stretch more than rubber band **A**.”*

Explain whether the results support the student’s prediction.

(3)

.....

.....

.....

.....

.....

.....

.....

(Total for Question 35 = 6 marks)



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

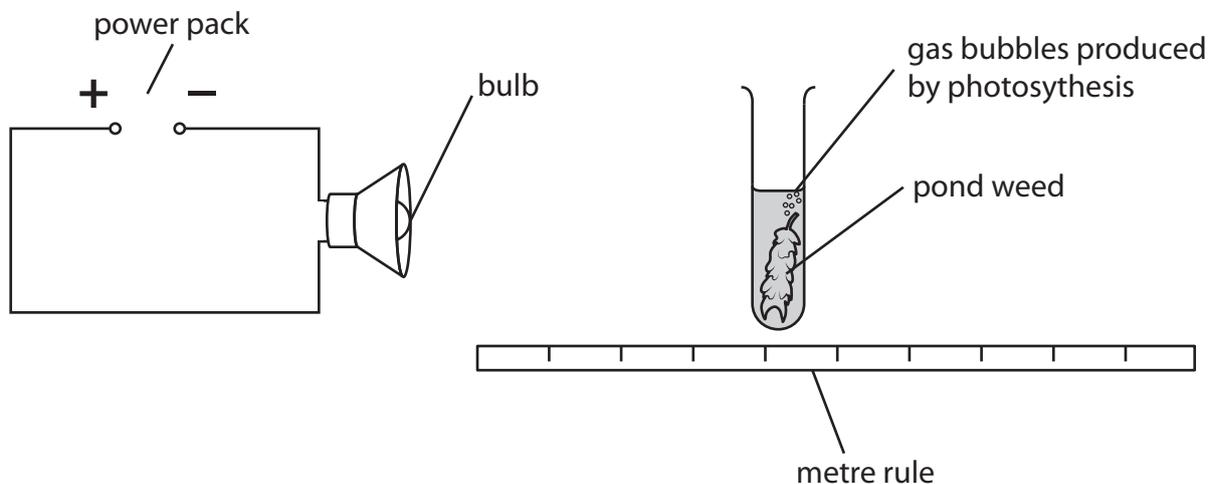
BLANK PAGE



36 A student wants to investigate the following question:

"How does light intensity or brightness affect the rate of photosynthesis in a piece of pond weed?"

The diagram shows the equipment the student uses in the investigation.



The investigation is done in a darkened room.

The distance between the bulb and the pondweed is 42 cm.

The brightness of the bulb can be varied by changing the voltage from the power pack.

The student varies the voltage and measures the rate of photosynthesis by counting the number of bubbles produced in one minute.

(a) Predict what might happen when the voltage is increased making the bulb brighter.

(1)



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

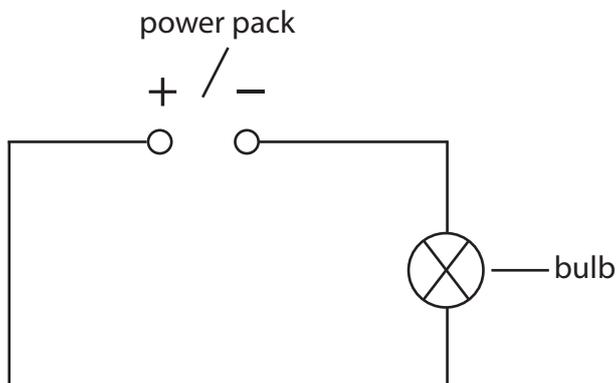
DO NOT WRITE IN THIS AREA

(b) This is the symbol for a voltmeter.



Add a voltmeter to the circuit diagram to show how the voltage across the bulb would be measured.

(1)



(c) The table shows the student's results.

Voltage across the bulb in volts (V)	
0	3
2	12
4	21
6	30
8	50
10	72
12	73

(i) Complete the table by adding the heading for the second column. (1)

(ii) Describe **one** way the student ensured they obtained valid results. (1)

(iii) State what the student should do to obtain reliable results. (1)

(d) State a further question that could be tested scientifically using the apparatus in the diagram. (1)

(Total for Question 36 = 6 marks)

TOTAL FOR SECTION B = 20 MARKS
TOTAL FOR PAPER = 80 MARKS



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

BLANK PAGE



P 6 5 7 9 7 A 0 3 5 3 6

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

BLANK PAGE

