

Write your name here

Surname

Other names

Centre Number

Candidate Number

**Pearson Edexcel International
Lower Secondary Curriculum**

Science

Year 9

Achievement Test

Wednesday 11 June 2014 – Afternoon

Time: 1 hour 20 minutes

Paper Reference

LSC01/01

You may need:

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.

Turn over ►

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PEARSON

SECTION A

Answer ALL questions

For questions 1 – 10 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 .
Each question is worth one mark.

1 Which is the addictive substance in cigarettes?

- A ash
- B carbon monoxide
- C nicotine
- D tar

(Total for Question 1 = 1 mark)

2 Which of these statements is true about **all** metals?

- A They are magnetic.
- B They are good conductors of heat.
- C They react with water.
- D They react with oxygen.

(Total for Question 2 = 1 mark)

3 A moving object with balanced forces acting on it will

- A change direction.
- B move at a constant speed.
- C slow down.
- D speed up.

(Total for Question 3 = 1 mark)



4 Which system in the human body breaks down food?

- A circulatory
- B digestive
- C reproductive
- D respiratory

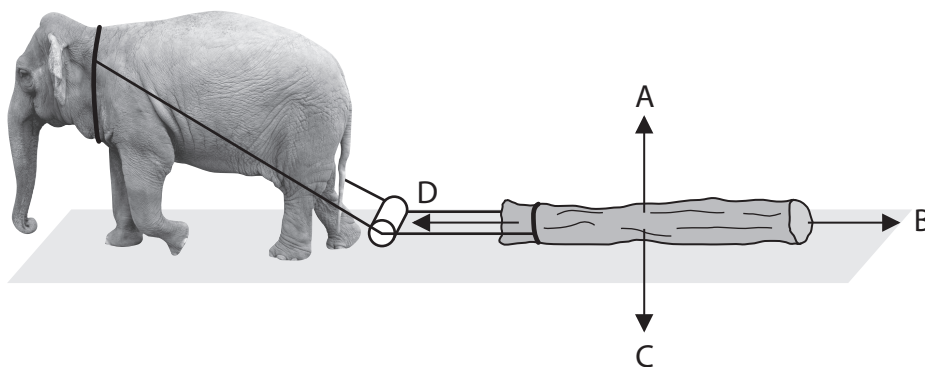
(Total for Question 4 = 1 mark)

5 Which of these rocks is most likely to be damaged by acid rain?

- A basalt
- B granite
- C limestone
- D slate

(Total for Question 5 = 1 mark)

6 An elephant is pulling a log.



Which arrow shows the force of friction on the log?

- A Arrow A
- B Arrow B
- C Arrow C
- D Arrow D

(Total for Question 6 = 1 mark)



7 Magnesium ions are used by plants to

- A absorb carbon dioxide.
- B help them absorb water.
- C keep insects away.
- D help make leaves green.

(Total for Question 7 = 1 mark)

8 **Malleable** means a metal is able to

- A conduct heat.
- B react with oxygen.
- C be hammered flat.
- D conduct electricity.

(Total for Question 8 = 1 mark)

9 James has a mass of 40 kg on Earth.

What is his weight on Earth?

- A 40 N
- B 400 N
- C 4 kg
- D 400 kg

(Total for Question 9 = 1 mark)

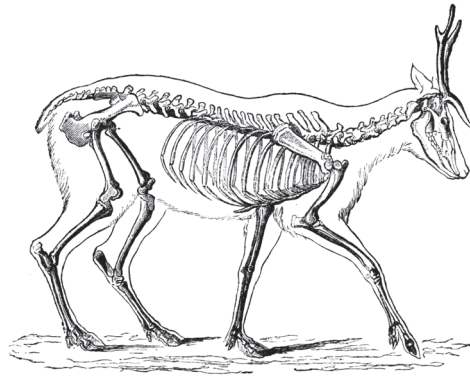
10 At the start of a food chain there is always a

- A carnivore.
- B herbivore.
- C predator.
- D producer.

(Total for Question 10 = 1 mark)



11 This picture shows the skeleton of a deer.



Give **three** functions of a skeleton.

- 1
- 2
- 3

(Total for Question 11 = 3 marks)

12 Draw a line to link each mixture with the method used to separate it. One has been done for you.

sand and salt	●	use a sieve
iron and sand	●	dissolve in water and decant
stones and sand	●	evaporation
sand and water	●	use a magnet
salt and water	●	filtration

A line is drawn from the dot in the 'sand and salt' box to the dot in the 'dissolve in water and decant' box.

(Total for Question 12 = 2 marks)



13 Give one advantage and one disadvantage of using hydrogen as a fuel.

Advantage

..... (1)

Disadvantage

..... (1)

(Total for Question 13 = 2 marks)

14 The picture shows the shape of a penguin when it is swimming.



(a) Name the force that is reduced by the penguin being this shape. (1)

(b) Choose the words from the box which complete the sentences below. Each word may only be used once.

adapted faster heavier slower streamlined

The penguin is shaped this way so that it is

This helps it to swim (2)

(Total for Question 14 = 3 marks)



For questions 15 – 24 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 .
Each question is worth one mark.

15 Green plants produce biomass using

- A carbon dioxide and water only.
- B carbon dioxide and light energy only.
- C carbon dioxide, light energy and water.
- D light energy and water only.

(Total for Question 15 = 1 mark)

16 An alkali could have a pH of

- A 1
- B 5
- C 7
- D 9

(Total for Question 16 = 1 mark)

17 Which force keeps the Earth in orbit?

- A gravitational attraction of the Sun
- B air resistance
- C gravitational attraction of the Moon
- D weight of the Earth

(Total for Question 17 = 1 mark)

18 Which of these is **not** used in organic farming?

- A biological control
- B chemical fertilisers
- C compost
- D crop rotation

(Total for Question 18 = 1 mark)



19 Sugar solution is an example of

- A a compound.
- B an element.
- C a mixture.
- D a solid.

(Total for Question 19 = 1 mark)

20 The gravitational force on an object is stronger if the object

- A has more mass.
- B has less mass.
- C is further away.
- D moves slower.

(Total for Question 20 = 1 mark)

21 Which of these inherited human characteristics is **not** affected by environmental factors?

- A body mass
- B eye colour
- C hair colour
- D height

(Total for Question 21 = 1 mark)

22 Which pair of rocks are both igneous?

- A basalt and granite
- B basalt and marble
- C granite and limestone
- D limestone and marble

(Total for Question 22 = 1 mark)



23 Which of these waves are in the electromagnetic spectrum?

- A light
- B seismic
- C sound
- D water

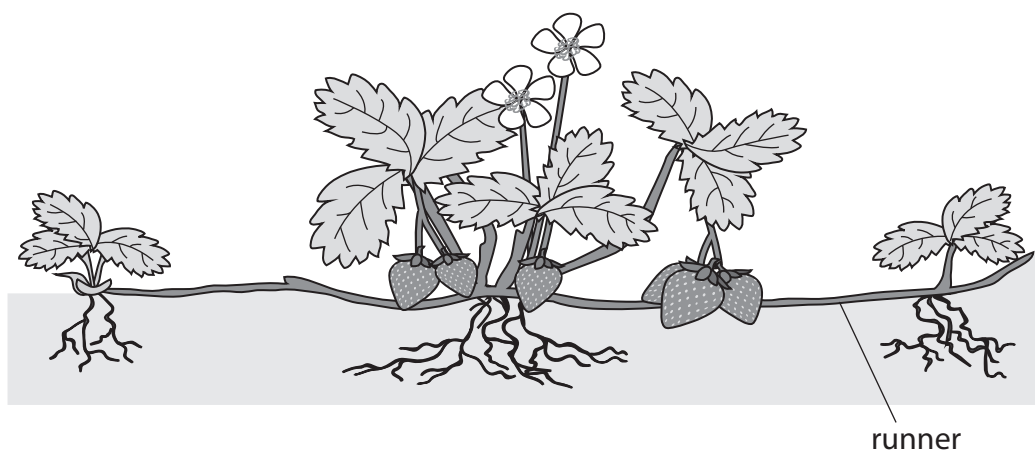
(Total for Question 23 = 1 mark)

24 Sex cells are called

- A alleles.
- B clones.
- C gametes.
- D genes.

(Total for Question 24 = 1 mark)

25 Strawberry plants are able to reproduce by forming runners.



(a) What is this type of reproduction called?

(1)

(b) Give **two features** of this type of reproduction.

1 (1)

2 (1)

(Total for Question 25 = 3 marks)



26 This table shows the results for the displacement reactions of four metals (**P, Q, R, S**) when placed in solutions of their sulfates.

× = no reaction

✓ = reaction

	P sulfate solution	Q sulfate solution	R sulfate solution	S sulfate solution
Metal P	×	×	✓	✓
Metal Q	✓	×	✓	✓
Metal R	×	×	×	×
Metal S	×	×	✓	×

(a) Put the four metals in order from **least reactive to most reactive**.

(2)

.....
(least reactive) **(most reactive)**

(b) Iron displaces copper from a solution of copper sulfate.

Complete the word equation for this reaction.

(2)

iron + copper sulfate → +

(Total for Question 26 = 4 marks)

27 (a) What is an artificial satellite?

(2)

.....

(b) Apart from in photography, give a use of an artificial satellite.

(1)

.....

(Total for Question 27 = 3 marks)



For questions 28 – 37 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 .
Each question is worth one mark.

28 Which of these statements about selective breeding is true?

- A It is a natural process.
- B The offspring are all identical.
- C It is an artificial process.
- D It only involves animals and not plants.

(Total for Question 28 = 1 mark)

29 Which of these is **not** a method of preventing the corrosion of metals?

- A galvanising
- B painting
- C plating
- D rusting

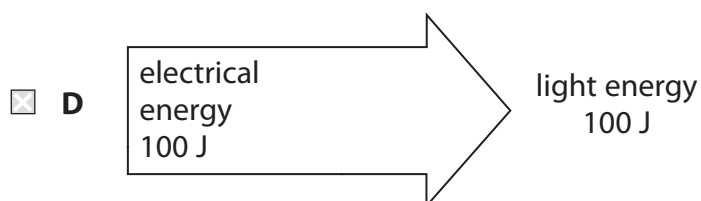
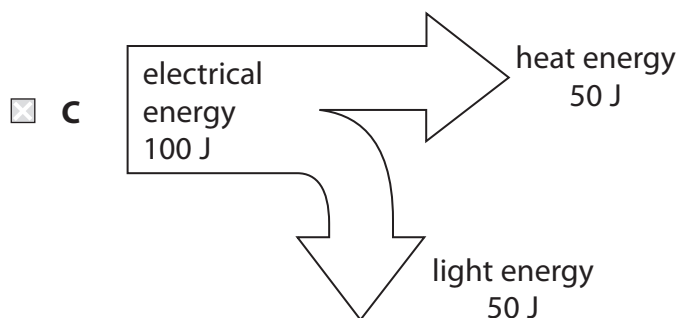
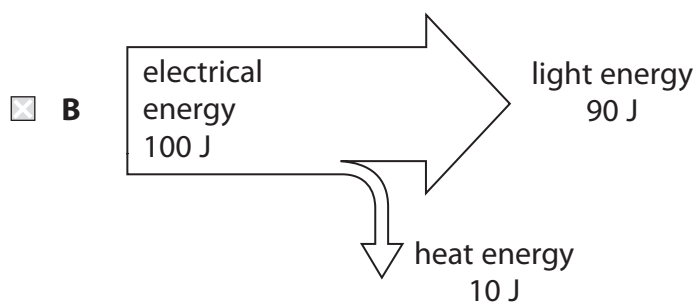
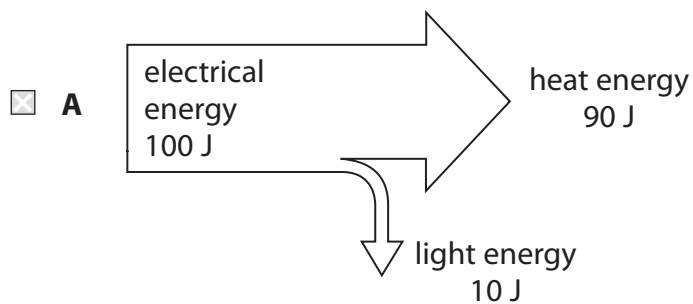
(Total for Question 29 = 1 mark)



30 This electric light bulb is 10% efficient.



Which Sankey diagram shows the correct energy transfer for this bulb?



(Total for Question 30 = 1 mark)



31 The birth mother of a cloned mammal may be

- A** a phenotype.
- B** a surrogate.
- C** identical to the clone.
- D** a genotype.

(Total for Question 31 = 1 mark)

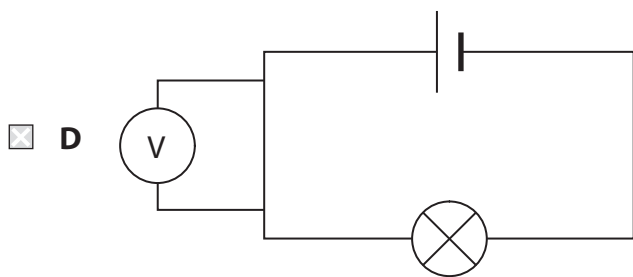
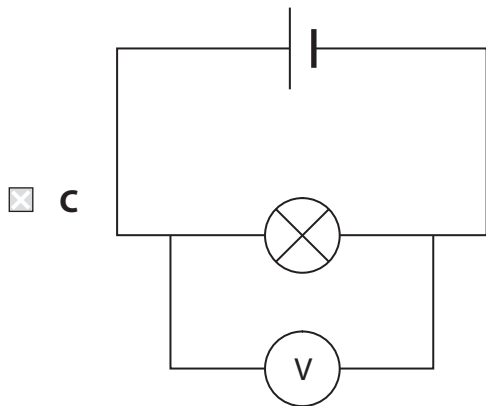
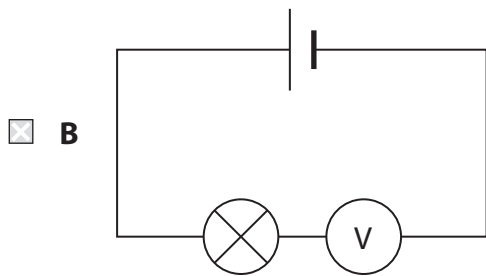
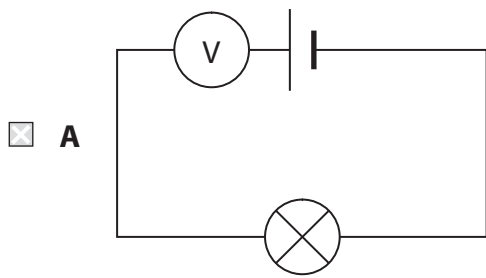
32 The correct formula for sodium chloride is

- A** HCl
- B** NaCl
- C** NaOH
- D** SoCl

(Total for Question 32 = 1 mark)



33 Which circuit is correctly set up to measure the voltage across the bulb?



(Total for Question 33 = 1 mark)



34 What is the shaded part of this Periodic Table showing?

																1 H hydrogen 1							4 He helium 2
7 Li lithium 3	9 Be beryllium 4											11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10						
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	40 Ar argon 18						
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36						
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[98] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54						
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86						
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[261] Rf rutherfordium 104	[262] Db dubnium 105	[266] Sg seaborgium 106	[264] Bh bohrium 107	[277] Hs hassium 108	[268] Mt meitnerium 109	[271] Ds darmstadtium 110	[272] Rg roentgenium 111	Elements with atomic numbers 112-116 have been reported but not fully authenticated												

- A gases
- B a group
- C metals
- D a period

(Total for Question 34 = 1 mark)

35 A photography company wants to launch a satellite to pass over all parts of the Earth. What sort of orbit should the satellite be in?

- A elliptical
- B equatorial
- C geostationary
- D polar

(Total for Question 35 = 1 mark)

36 When a metal reacts with a dilute acid, a gas is produced.

What is the name of the gas produced?

- A carbon dioxide
- B hydrogen
- C nitrogen
- D oxygen

(Total for Question 36 = 1 mark)

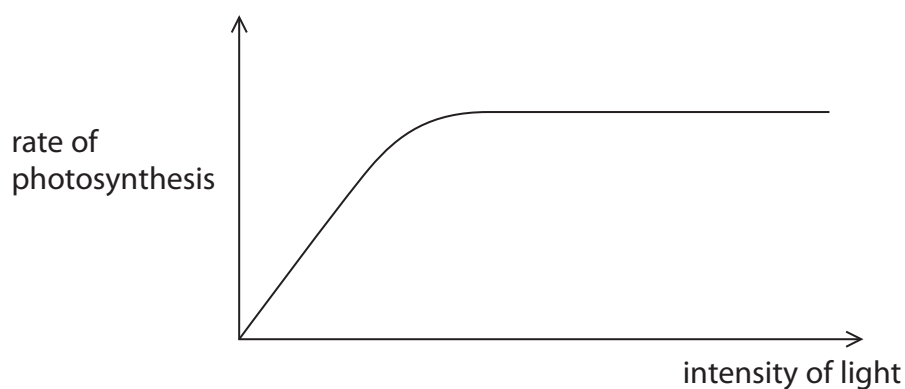


37 Which row in the table gives a correct description of the refraction and reflection of light waves?

	Refraction	Reflection
<input type="checkbox"/> A	they change direction and speed	they change direction and speed
<input type="checkbox"/> B	they change direction but not speed	they change direction but not speed
<input type="checkbox"/> C	they change direction but not speed	they change direction and speed
<input type="checkbox"/> D	they change direction and speed	they change direction but not speed

(Total for Question 37 = 1 mark)

38 The graph shows how the rate of photosynthesis is affected by changes in the intensity of light.



Use the graph to describe the effect of increasing the intensity of light on the rate of photosynthesis.

.....

.....

.....

.....

(Total for Question 38 = 2 marks)



39 (a) Complete this Punnett square to show the possible outcomes if both parents carry a normal allele **F** and a cystic fibrosis allele **f**.

(1)

		Father's sex cells	
		F	f
Mother's sex cells	F		
	f		

(b) Circle the outcome which would result in a person with cystic fibrosis.

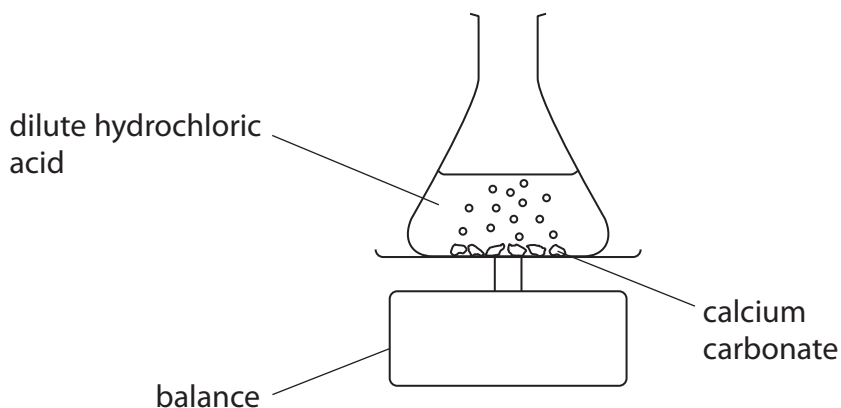
(1)

(Total for Question 39 = 2 marks)



40 Helen investigates the reaction between dilute hydrochloric acid and calcium carbonate.

She uses the apparatus below:



At the start of the reaction the total mass of the flask and its contents was 100 g.

(a) If the law of conservation of mass is obeyed during the reaction, what should the total mass be at the end of the reaction?

(1)

.....g

(b) Helen finds that her reaction does **not** seem to obey the law of conservation of mass.

The word equation for the reaction is:



Use this word equation for the reaction to suggest a reason for this.

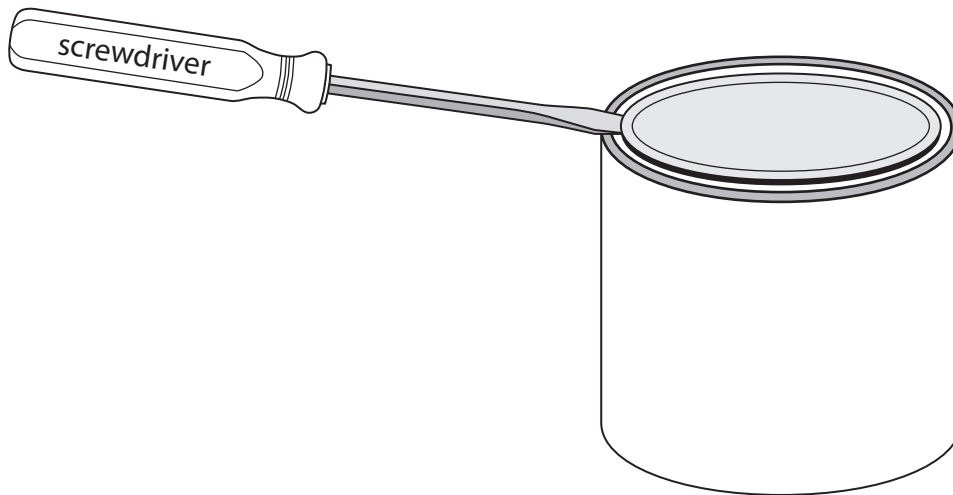
(1)

.....
.....

(Total for Question 40 = 2 marks)



41 The diagram shows a screwdriver being used as a lever to open a tin.



(a) On the diagram, draw an X to show the pivot. (1)

(b) Draw an arrow to show the best position and direction of the force used to open the tin. (2)

(c) The length of the lever is 0.2 m. The force used is 5 N.
Calculate the moment of the force. (1)

..... Nm

(Total for Question 41 = 4 marks)

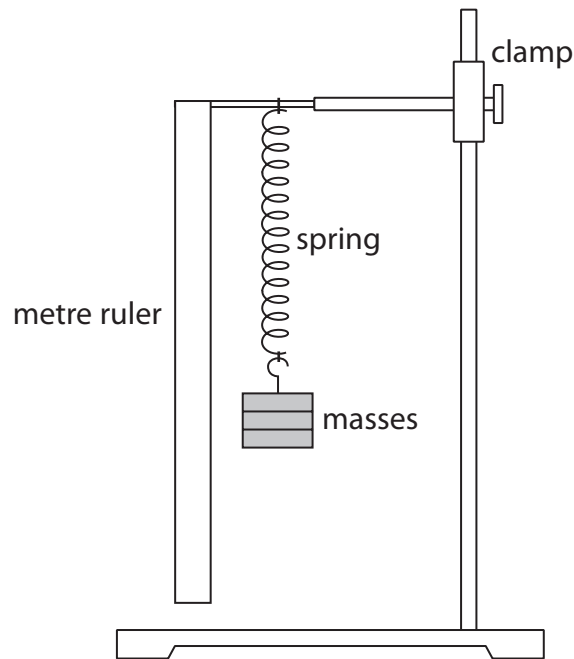
TOTAL FOR SECTION A = 60 MARKS



SECTION B

Answer ALL questions.

- 42 Krishna investigates how increasing the force on a spring changes its length. She does this by attaching different numbers of masses to the spring.



She measures the length of the spring with different numbers of masses attached. She records the results in a table, and calculates the change in length of the spring.

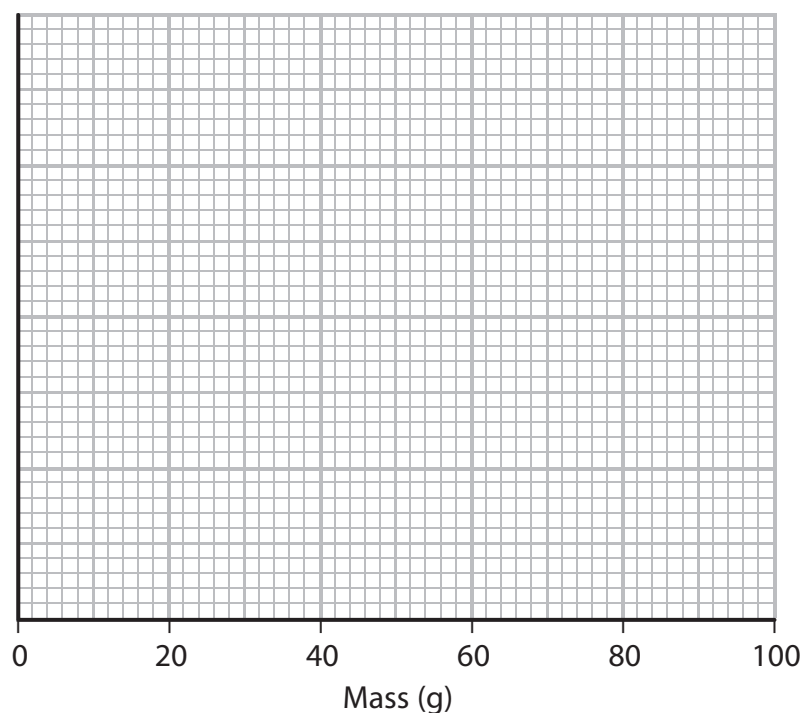
Mass (g)	Length of spring (cm)	Change in length of spring (cm)
0	2	0
20	9	7
40	16	14
60	27	25
80	31	29

- (a) On the grid, plot a line graph of change in length of spring against mass.
- Use a suitable scale on the vertical axis
 - Plot the points but **do not join them**

(3)



Change in length of spring (cm)



(b) Look at the points that you have plotted.

(i) Put a circle round the point that could be an anomaly.

(1)

(ii) What should Krishna do about this result?

(1)

(c) (i) Draw a line of best fit through the points. Use a ruler. **Do not** include the point you have circled.

(1)

(ii) Predict the change in length of the spring if a mass of 100 g was attached to it.

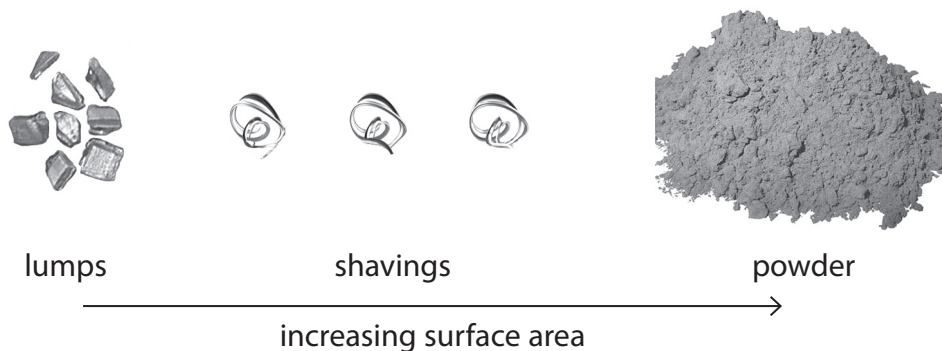
(2)

(Total for Question 42 = 8 marks)



43 Luke is investigating how the surface area of a metal affects the time taken to react with an acid.

He uses the same mass of metal as lumps, as shavings and as a powder.



He times how long it takes for the metal to react completely.

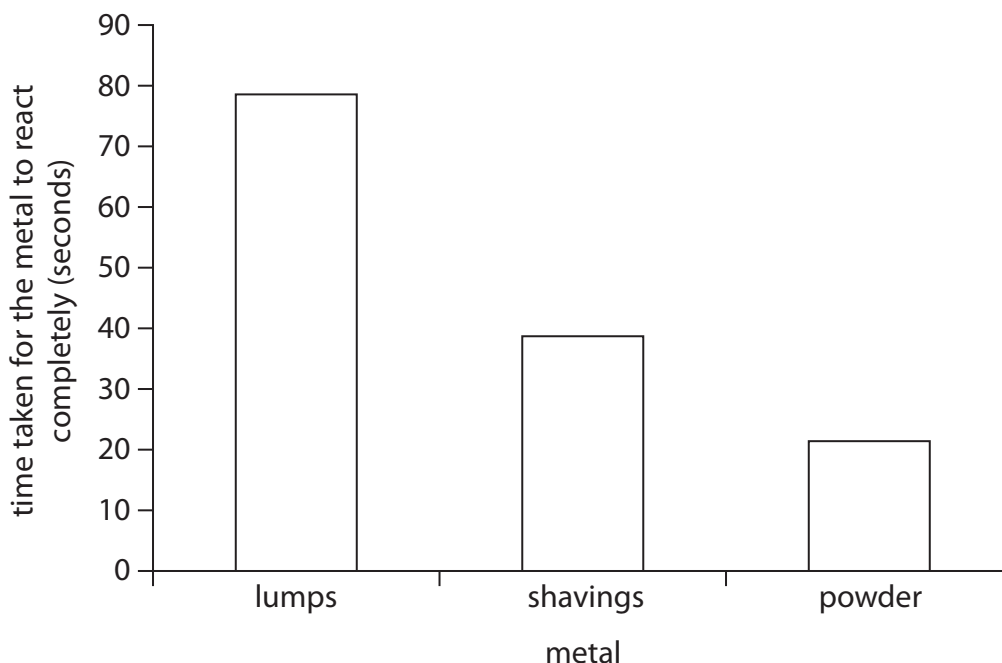
(a) As Luke is using an acid, suggest **two** safety precautions he should take during and after his experiment.

(2)

1

2

This bar chart shows Luke's results.



(b) What is the relationship between the surface area of a metal and the time it takes to react with an acid?

(2)

.....

.....

(c) Luke repeats the experiment with a more dilute sample of the acid.

Suggest how using a more dilute sample of the acid affects the time taken for the metal to react completely.

(1)

.....

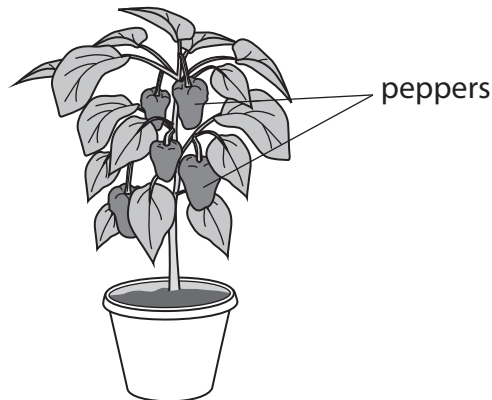
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(Total for Question 43 = 5 marks)



44 Sieb grows pepper plants.



Sieb wants his plants to produce more peppers. He decides to add different fertilisers to the soil.

The fertilisers that he uses contain nitrogen, phosphorus and potassium in different proportions.

His friend says that to get more peppers, Sieb should use a fertiliser lower in nitrogen, and higher in both phosphorus and potassium.

These are the five fertilisers (A to E) that Sieb uses.

Fertiliser	Proportions in each fertiliser		
	Nitrogen	Phosphorus	Potassium
A	1	1	1
B	1	2	2
C	2	1	1
D	2	1	2
E	2	2	1

Sieb fills thirty plant pots with soil. In each tray of six pots he uses one of the fertilisers and puts in a pepper plant.

Below is an example of one of the trays.



(a) Why does he grow **six** pepper plants using each fertiliser? (1)

.....
.....

(b) If Sieb's friend is correct, which fertiliser will produce the most peppers? (1)

(c) Sieb keeps these factors the same:

- size of pot
- amount and type of soil
- size and type of plant at the start
- amount of fertiliser

To make it a fair test, give **two** other factors Sieb must keep the same while the plants are growing.

1 (1)

2 (1)

(d) In this investigation, which is the

(i) independent variable? (1)

.....
(ii) dependent variable? (1)

.....
(e) After doing the experiment, Sieb's friend told him that he should have grown some peppers in soil without fertiliser. Explain why he should have grown some peppers in soil without fertiliser. (1)

.....
.....
.....
(Total for Question 44 = 7 marks)

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



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