Particle Model

Total Mark – 15

Question: 1

15 Substance **Y** melts at −7 °C and boils at 59 °C.

What is the state of substance **Y** at room temperature?

A Gas

B Liquid

C Plasma

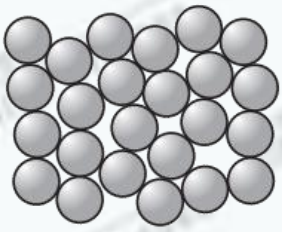
D Solid

Your answer ☐ **[1]**

15	B	**1**	**2.1**

Question: 2

1 This particle model shows the particles in iron.



What state does this particle model represent?

A Gas

B Liquid

C Plasma

D Solid

Your answer ☐ **[1]**

1	B	**1**	**1.1**

Question: 3

2 A student reacts calcium carbonate with hydrochloric acid.

$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + H_2O(l) + CO_2(g)$

What physical state does **(g)** represent in the balanced symbol equation?

A Aqueous

B Gas

C Liquid

D Solid

Your answer ☐ **[1]**

2	B	**1**	**1.1**

Question: 4

3 Substances can exist in three states of matter.

Solid ⇌ Liquid ⇌ (Y) Gas

What is change of state **Y** called?

A Condensing

B Evaporating

C Freezing

D Melting

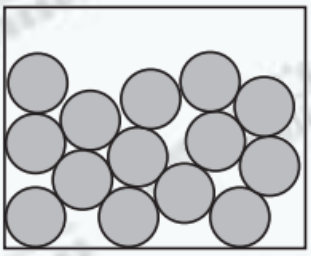
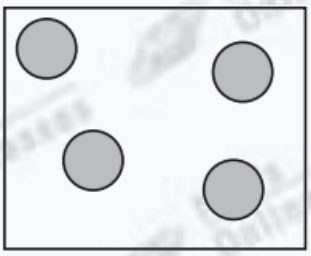
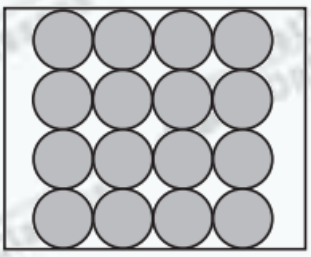
Your answer ☐ **[1]**

3	A	**1**	**1.1**

Question: 5

16 The particle model shows how particles are arranged and how they move in the three states of matter.

(a) (i) Draw a line to match each **diagram** with the correct **state of matter**.

Diagram	State of matter
	Solid
	Liquid
	Gas

[2]

(ii) When a liquid is heated to its boiling point, it will turn into a gas.

Use the particle model to explain why this is a **physical change**.

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..... **[1]**

(b) The table shows the properties of different substances.

Substance	Melting point (°C)	Boiling point (°C)	Soluble in water?	Conducts electricity in solid state?	Conducts electricity in molten state?
A	−210	−196	No	No	No
B	1084	2562	No	Yes	Yes
C	605	1137	Yes	No	Yes
D	−78	−34	Yes	No	No

(i) Which **two** substances are gases at room temperature?

Tick (✓) **two** boxes.

A ☐

B ☐

C ☐

D ☐

[1]

(ii) Substance **C** is an ionic substance.

Use the information in the table to explain why.

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..... **[2]**

(c) You are provided with a mixture of substances **B** and **C**.

Substance **B** is insoluble in water. Substance **C** is soluble in water.

(i) Describe how you could separate substance **B** from the mixture.

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(ii) Describe how you would then obtain substance **C** after separating substance **B**.

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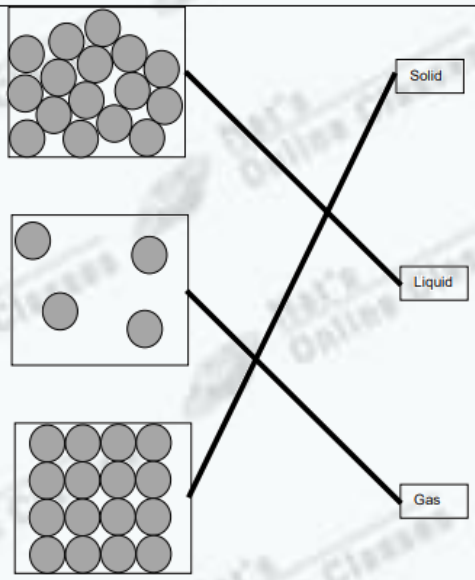
..... **[2]**

Question			Answer	Marks	AO element	Guidance
16	(a)			2	2 x 1.1	All correct = 2 marks 1 or 2 correct = 1 mark If more than one line drawn to state of matter **DO NOT** award the mark.
		(ii)	**Any one from:** The particles remain the same / No new substance is made ✓ The (changed) arrangement of the particles can be reversed / The change is reversible ✓	1	1.1	**ALLOW** the particles **only** gain or lose energy
	(b)	(i)	A **AND** D ✓	1	3.1a	

Question			Answer	Marks	AO element	Guidance
		(ii)	**Any two from:** Conducts electricity in molten state ✓ Does not conduct electricity in solid state ✓ High melting point ✓	2	3.2b	ALLOW dissolve in water
	(c)	(i)	Add water (and stir) ✓ Filtration ✓ **B** collects on filter paper ✓	3	3.3a 1.2 3.3a	
		(ii)	Distillation **OR** evaporation **OR** heating ✓ Removes water **OR** dries C **OR** removes some water and leave to crystalise ✓	2	1.2 3.3a	**ALLOW** boiling