



Mark Scheme (Results)

Summer 2025

Pearson Edexcel International GCSE
In Science Single Award (4SS0) Paper 1C

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question number	Answer	Notes	Marks
1 (a)	nucleus	ACCEPT nuclei / nucleon REJECT neutrons / neutral	1
(b)	C (group 7 period 3) A is not the correct answer because the element is not in Group 2 or Period 7 B is not the correct answer because the element is not in Group 3 or Period 7 D is not the correct answer because the element is not in Period 2		1
(c)	D (20) A is not the correct answer as this atom of element Q has not got 7 neutrons B is not the correct answer as this atom of element Q has not got 17 neutrons C is not the correct answer as this atom of element Q has not got 18 neutrons		1
(d)	chlorine	ACCEPT Cl / Cl ₂ REJECT chloride	1

Total marks for question 1 = 4

Question number	Answer	Notes	Marks
2 (a) (i)	melting	ALLOW melt	1
(ii)	condensing / condensation		1
(b)	Movement: M1 freedom of movement Arrangement: M2 (particles are) in random arrangement / far apart / spread out / not touching	condone ideas of particles bouncing off each other or moving with high KE / speed ALLOW diagram for M2 ALLOW not in fixed position / arrangement IGNORE particles are packed loosely / vibrate IGNORE reference to force	2

Total marks for Question 2 = 4

Question number	Answer	Notes	Marks
3 (a)	alkali metals	REJECT alkaline	1
(b) (i)	B (a lilac flame is seen) A is not the correct answer as lithium produces a colourless solution when it reacts with water C is not the correct answer as lithium will effervesce when it reacts with water D is not the correct answer as lithium does float in water		1
(ii)	M1 blue / purple M2 (because) OH ⁻ / hydroxide ions are present	ALLOW violet / lilac IGNORE qualifiers ALLOW an alkaline solution / an alkali is produced / a solution of high pH is formed	2
(iii)	$2\text{Li} + 2\text{H}_2\text{O} \rightarrow 2\text{LiOH} + \text{H}_2$ M1 two products correct M2 rest of equation correct	ACCEPT LiOH / H ₂ M2 dep on M1 ALLOW multiples or fractions IGNORE state symbols	2

Total marks for Question 3 = 6

Question number	Answer	Notes	Marks																			
4 (a)	<table><tr><th rowspan="2">Separation</th><th colspan="4">Method</th></tr><tr><th>crystallisation</th><th>filtration</th><th>fractional distillation</th><th>simple distillation</th></tr><tr><td>water from sodium chloride solution</td><td></td><td></td><td></td><td>✓</td></tr><tr><td>a liquid from a mixture of two liquids with different boiling points</td><td></td><td></td><td>✓</td><td></td></tr></table>	Separation	Method				crystallisation	filtration	fractional distillation	simple distillation	water from sodium chloride solution				✓	a liquid from a mixture of two liquids with different boiling points			✓		ACCEPT alternative symbols used instead of the tick. M1 for the first row M2 for the second row REJECT the mark for each row if more than one tick is drawn	2
Separation	Method																					
	crystallisation	filtration	fractional distillation	simple distillation																		
water from sodium chloride solution				✓																		
a liquid from a mixture of two liquids with different boiling points			✓																			
(b) (i)	M1 (food colouring Y) contains dyes B and D M2 and one other / unknown dye OR M2 (food colouring Y) contains three (different) dyes	ALLOW solute for dye IGNORE colours / pigments	2																			
(ii)	M1 distance from the start line to B = 1.5 to 1.8 and distance moved by solvent front = 8.1 to 8.2 $R_f = \frac{1.5 \text{ to } 1.8}{8.1 \text{ to } 8.2}$ M2 = fraction evaluated	If fraction inverted, no M2 M2 dep on M1 ALLOW any SF correctly rounded	2																			
(c)	M1 add the mixture to water OR M1 stir / dissolve the mixture in water M2 filter (to remove the broken glass) M3 heat/boil (to evaporate the water from the solution) to obtain the sodium chloride	ALLOW add water to the mixture IGNORE heating the solution before filtration M2 dep on M1 M3 dep on M2 ALLOW evaporate OR crystallise IGNORE further filtration to obtain crystals of sodium chloride	3																			

Total marks for Question 4 = 9

Question number	Answer	Notes	Marks
5 (a)	$\text{Ca(OH)}_2(\text{aq}) + \text{CO}_2(\text{g})$ $\rightarrow \text{CaCO}_3(\text{s}) + \text{H}_2\text{O}(\text{l})$	all 4 correct scores 2 2 or 3 correct scores 1	2
(b) (i)	44% with or without working scores 3 marks M1 (volume of carbon dioxide) 80-45 OR 35(cm ³) M2 $(35 \div 80) \times 100$ M3 44 (%) to 2 SF	ALLOW ECF from M1 ALLOW ECF from M2 for a percentage calculation using data from the question	3
(ii)	M1 swap the syringes around OR M1 pass the gas through the limewater (again) M2 (until) same volume of gas / no change in volume	ALLOW add more limewater	2

Total marks for Question 5 = 7

Question number	Answer	Notes	Marks
6 (a)	70		1
(b)	Colour: M1 fuel oil is darker (in colour) OR gasoline is lighter (in colour) Boiling point: M2 fuel oil has a higher (boiling point) OR gasoline has a lower (boiling point) Viscosity: M3 fuel oil has a higher / greater (viscosity) OR gasoline has a lower (viscosity)	ACCEPT fuel oil is yellow OR orange / has a colour and gasoline is colourless REJECT other colours ACCEPT fuel oil has a high boiling point and gasoline has a low boiling point ALLOW gasoline is more runny ALLOW fuel oil is more viscous / gasoline is less viscous	3
(c) (i)	M1 surround / submerge / cool the U-tube with ice / water (bath) M2 so (more) water vapour condenses	ALLOW any way of cooling the U-tube ALLOW steam for water vapour	2
(ii)	M1 carbon / soot is formed M2 by incomplete combustion	ALLOW (because) there is insufficient oxygen	2
(iii)	M1 add anhydrous / white copper sulfate M2 turns blue	M2 dep on M1 ALLOW M1 add anhydrous / blue cobalt chloride M2 turns pink M2 dep on M1	2

Total marks for Question 6 = 10

Question number	Answer	Notes	Marks
7 (a) (i)	M1 polymers are non-biodegradable / inert / unreactive / do not breakdown (in soil) OR M1 Polymers will remain in landfill sites indefinitely / are filling up OWTTE M2 polymers give greenhouse gases when burned OR M2 burning produces toxic gases	condone the ideas of being hard / taking a longer time to decompose IGNORE harmful to the environment / ecosystem / wildlife ALLOW reference to global warming / climate change ALLOW carbon monoxide / CO / Hydrogen chloride / HCl ALLOW M1 and M2 in reverse	2
(ii)	M1 (M_r of chloroethene) = $12 \times 2 + 1 \times 3 + 35.5$ OR 62.5 M2 $295\,750 \div 62.5$ M3 4732	4732 without working scores M3 only ALLOW ECF from M1 REJECT calculation using 4700 for M2 No ECF from M2	3
(b) (i)	11 340 with or without working scores 4 M1 (temperature readings) 19(°C) and 41.5(°C) M2 (ΔT) 22.5(°C) OR 41.5 - 19(.0) M3 $120 \times 4.2 \times 22.5$ M4 11 340(J)	M2 subsumes M1 ALLOW ECF from M1 ALLOW ECF from M2 ALLOW ECF from M3 if $Q = m c \Delta T$ is used ACCEPT any value that rounds to 11 000	4
(ii)	heat / thermal energy loss (to the surroundings)	ALLOW no lid on the beaker / poor insulation / heat absorbed by the beaker / incomplete combustion	1

Total marks for Question 7 = 10

Question number	Answer			Notes	Marks
8 (a)	M1	NaCl	MgCl ₂	AlCl ₃	Penalise incorrect use of letter cases and subscripts 3
	M2	Na ₂ SO ₄	MgSO ₄	Al ₂ (SO ₄) ₃	
	M3	Na ₃ N	Mg ₃ N ₂	AlN	
(b)	M1 do a flame test			ALLOW any description of a flame test IGNORE burning	2
	M2 yellow flame			ALLOW orange / yellow-orange flame	
(c)	SiCl₄ Bonding: M1 the intermolecular forces / forces (of attraction) between molecules (in silicon chloride) OR Structure: M1 Silicon chloride consists of small / individual / separate molecules M2 (forces) are weak NaCl Bonding: M3 the electrostatic (forces of) attraction between the sodium ions and the chloride ions / the oppositely charged ions OR Structure: M3 forces holding the (giant) lattice / structure together M4 (forces) are strong Comparison M5 more energy / heat is required to break / overcome the electrostatic attractions / (ionic) bonds (in sodium chloride) OWTTE OR			ALLOW intermolecular bonds / bonds between molecules REJECT forces between bonds / incorrect particles ALLOW molecules are in a random arrangement M2 dep on M1 ALLOW electrostatic attraction between cations / positive ions and anions / negative ions ALLOW regular array / packing of ions as an alternative to lattice / structure M4 dep on M3 M5 for comparison between SiCl₄ and NaCl No M5 if reference to breaking incorrect bonds in NaCl	5

	M5 less energy / heat is required to overcome the intermolecular forces (in silicon chloride) OWTTE	No M5 if reference to breaking covalent bonds / incorrect bonds in SiCl_4	
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Total marks for Question 8 = 10

