

Question	Answer	Marks	Guidance
1	C	1	

Question	Answer	Marks	Guidance
2	C	1	

Question	Answer	Marks	AO element	Guidance
3	C	1	AO2.2	

Question	Answer	Marks	AO element	Guidance
4	B	1	AO2.2	

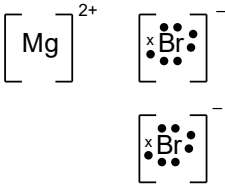
Question	Answer	Marks	AO element	Guidance
5	A	1	AO2.2	

Question	Answer	Marks	AO element	Guidance
6	B	1	AO2.6	

Question			Answer	Marks	AO element	Guidance
7	(a)		s-block AND highest energy or outer electron is in a s orbital or s sub-shell ✓	1	1.1	ALLOW 'outer' or 'valence' for 'highest energy' IGNORE electron configurations DO NOT ALLOW s shell / energy level
	(b)		FIRST CHECK THE ANSWER ON ANSWER LINE If answer = 25.982 award 2 marks $\frac{78.99 \times 23.985 + 10.00 \times 24.986 + 11.01 \times m}{100} = 24.305 \checkmark$ Relative isotopic mass = 25.982 (must be 5 SF) ✓	2	2.2 x2	ALLOW any correct rearrangement of this sum for first mark eg $11.01 \times m = 2430.5 - 1894.575 - 249.86$ ALLOW ecf for transcription errors in first sum but answer must be 5 sf

Question	Answer	Marks	AO element	Guidance
8	B	1	1.2	

Question	Answer	Marks	AO element	Guidance
9	B	1	2.2	

Question			Answer	Marks	AO element	Guidance
10	(a)		(The mean/average mass) taking into account the relative abundances of the isotopes ✓	1	1.1	ALLOW sum of (isotopic mass × %abundance) sum of (isotopic mass × abundance) / total abundance DO NOT ALLOW average mass of the isotopes
		(i)	 Mg with no (or 8) outer electrons AND 2 × Br with 'dot-and-cross' outer octet ✓ Correct charges ✓	2	1.2 2.5	ALLOW 8 electrons in Mg ²⁺ BUT 'extra' electron in Br ⁻ must match symbol for electrons in Mg ²⁺ IGNORE inner shells and circles ALLOW 1 mark if both electron arrangements and charges are correct but only one Br is drawn. ALLOW 2[Br ⁻], 2[Br] ⁻ (brackets not required)
		(ii)	FIRST CHECK THE ANSWER ON ANSWER LINE If answer = 1.71 × 10²² award 3 marks ----- $n(\text{MgBr}_2) = \frac{1.74}{184.1} = 0.00945\ldots \text{ mol } \checkmark$ Moles of ions = 0.00945... × 3 = 0.0283... mol ✓ Number of ions = 0.0283... × 6.02 × 10²³ = 1.71 × 10²² ✓ 3SF required	3	2.2×3	ALLOW ECF Calculator answer = 9.451385117 × 10 ⁻³ ALLOW ECF from incorrect moles of ions. e.g. 0.00945 Common error 5.69 × 10 ²¹ no × 3 2 marks

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	11	(a)	$\text{Ni} : \text{S} : \text{N} = \frac{16.26}{58.7} : \frac{35.36}{32.1} : \frac{31.0}{14}$ OR 0.277 : 1.10 : 2.21 OR 1 : 4 : 8 ✓ $x = 4$ ✓ $2 + x + y = 8$ $y = 2$ ✓	3	3.1×1 3.2×2	ALLOW any correct method ALLOW NiS ₄ N ₈ for ratio ALLOW ECF for y from incorrect x

Question	Answer	Marks	AO element	Guidance
12	B	1	AO2.2	

Question	Answer	Marks	AO element	Guidance
13	B	1	2.2	

Question	Answer	Marks	AO element	Guidance
14	B	1	2.2	

Question	Answer	Marks	AO element	Guidance
15	B	1	AO1.2	

Question	Answer	Marks	AO element	Guidance
16	C	1	AO2.2	

Question	Answer	Marks	AO element	Guidance
17	D	1	AO2.2	