

Question	Answer	Marks	AO Element	Notes	Guidance
1	C - Potassium reacts with water to form hydrogen gas.	1			
2	<i>any three of:</i> - conducts electricity / conducts heat - malleable - ductile - shiny / lustrous	3			
3	any two of: • conducts electricity • conducts heat • malleable • ductile • shiny / lustrous	2			
4	L	1			
5	one mark each for any two of: • malleable • ductile • conducts electricity / conducts heat • shiny / lustrous	2			
6	<u>mixture</u> of metals / <u>mixture</u> of metal and non-metal / <u>mixture</u> of metal with another element	1			

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7	C - 1 and 3 only	1			
8	D - It forms covalent compounds.	1			
9	the more zinc, the stronger (the brass) / the less copper the stronger (the brass);	1			
10	C / iron / Fe	1			
11	K	1			
12	(stainless steel / it) is more resistant to corrosion (than pure metal)	1			

Question	Answer	Marks	AO Element	Notes	Guidance
13	<p>One mark each for any 3 of:</p> <ul style="list-style-type: none"> • iron has high melting point / boiling point / ORA for K • iron has high density / ORA for K • iron has catalytic activity / ORA for K • iron forms coloured <u>compounds</u> / ORA for K • iron <u>compounds</u> have variable oxidation states / form ions with different charges / ORA for K • iron is hard / potassium is soft / iron is strong / potassium is weak • one suitable difference in chemical properties e.g. iron is less reactive than potassium ORA / potassium reacts with cold water / iron does not react with cold water / iron rusts / potassium does not rust • iron is magnetic / ORA for K 	3			

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14(a)	any two from: high melting point / boiling point hard dense conduct electricity conduct heat ductile / malleable sonorous lustrous / shiny	2			
14(b)	basic (oxide)	1			
15(a)	aluminium (1) has the lowest density / has a low density (1)	2			
15(b)	aluminium has the best (electrical) conductivity	2			
15(c)	cobalt AND nickel	1			

Question	Answer	Marks	AO Element	Notes	Guidance
16	any 3 from: <ul style="list-style-type: none"> metals conduct electricity / heat ORA metals are malleable ORA metals are ductile ORA metals are sonorous / ring when hit ORA metals are shiny / lustrous ORA 	3			
17(a)	increasing strength decreases (thermal) conductivity / the lower the conductivity the higher the strength;	1			
17(b)	high strength aluminium;	1			
	has high strength / it is strong / aircraft body need to be strong;	1			
	it has low density / it is light(weight) / aircraft body needs to be light(weight);	1			
18(a)	M1 same number of electrons M2 (same number of) electrons in outer shell	2			

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18(b)	$\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$ M1 MgCl_2 as product M2 fully correct equation	2			
18(c)	M1 test: lighted / burning splint M2 result: (squeaky) pop	2			
19(a)	ZnSO_4 written on product line (1) H_2 written on product line (1) states (aq) AND (g) (1)	3			
19(b)	(labelled) arrow pointing upwards starting level with reactants and finishing level with top of the hump.	1			
19(c)	exothermic AND products are at lower energy (than reactants)	1			

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20	any three from: <ul style="list-style-type: none"> • high melting point / high boiling point • high density • forms coloured compounds • forms ions with different charges / forms ions with variable valency / form ions with different oxidation numbers • forms complex ions • can be used as a catalyst 	3			
[Total: 48]					