

METALS & NON-METALS 5

MARK SCHEME

Q1.

Question	Answer	Extra information	Marks
A	3		
B	4		
C	2		
D	1		
Total marks			4

Q2.

Question	Answer	Extra information	Marks
A	1		
B	2		
C	4		
D	3		
Total marks			4

Q3.

Question	Answer	Extra information	Marks
(a)	4		1
(b)	3		1
(c)	2		1
(d)	2		1
Total marks			4

Q4.

Question	Answer	Extra information	Marks
A	2		
B	3		
C	4		
D	1		
Total marks			4

Q5.

Question	Answer	Extra information	Marks
A	4		
B	3		
C	2		
D	1		
Total marks			4

Q6.

Question	Answer	Extra information	Marks
(a)	3		1
(b)	2		1
(c)	3		1
(d)	2		1
Total marks			4

Q7.

Question	Answer	Extra information	Marks
(a)	(because to produce low-carbon steel) oxygen is needed to react with / oxidise carbon (to produce titanium) an atmosphere of argon is used because it is unreactive any oxygen / air would react with / oxidise magnesium or titanium	accept (to produce low-carbon steel) oxygen removes carbon as carbon dioxide ignore magnesium chloride / titanium chloride reacts with oxygen	1 1 1
(b)	for titanium: • there are more stages in its manufacture • larger amounts of energy are needed • magnesium / chlorine / argon have to be produced or are expensive or are used	it = titanium ignore references to abundance / usefulness / temperature / amounts / relative reactivity / equipment allow converse arguments for iron accept slower rate of production or is more labour intensive or a batch process is used or the process used is not continuous accept the titanium chloride is cooled and reheated which is not energy efficient	1 1 1

(c)	titanium is below magnesium and above iron (in the reactivity series of metals)	allow similar position to aluminium or carbon or zinc	1
	because magnesium removes chlorine from titanium chloride and titanium removes oxygen from iron oxide OR magnesium more reactive than titanium because it removes chlorine from titanium chloride (1) titanium more reactive than iron because it removes oxygen from iron oxide (1)	allow magnesium displaces titanium and titanium displaces iron accept magnesium more reactive than titanium because it displaces titanium accept titanium more reactive than iron because it displaces iron	1
Total marks			8

Q8.

Question	Answer	Extra information	Marks
(i)	16 and 9	in this order	1
(ii)	any two from: (100% / pure) gold is soft (alloyed) to make the metal hard(er) gold is expensive or alloy is less expensive	ignore reasons about colour / lustre / corrosion / rarity allow layers can slide in pure gold ignore just 'the ring is an alloy' allow (alloyed) to stop the layers sliding allow (alloyed) to make the metal strong	2
Total marks			3