Marking Scheme for Paper 3

1	2	3	4	5	6	7	8	9	10
А	В	D	С	В	В	В	С	D	В
11	12	13	14	15	16	17	18	19	20
Α	Α	С	В	D	С	С	D	D	С

Marking Scheme for Paper 4

Section A				
Qn	Answers	Marks		
1a	ZnO	1m each		
1b	H ₂			
1c	Na ₂ O			
1d	Cl ₂			
2a	Ζ	1m each		
2b	W and X			
2c	V or T			
2d	$2 \begin{bmatrix} w \\ w \end{bmatrix}^{3+} 3 \begin{bmatrix} x \\ y \\ x \end{bmatrix}^{2-}$	1 – correct charges 1 – correct ratio, electrons, particle/ symbol		
3a	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1		
3b	Nickel and 200 °C (accept 180 °C)	both correct- 1m		
3с	Bubble both gases into two separate test tube of <u>aqueous</u> <u>bromine</u> . If gas is <u>propene</u> , aqueous bromine turns <u>from reddish brown to</u> <u>colourless.</u> If gas is propane, aqueous bromine remains reddish brown. A: bromine solution	 1 – correct indicator 1 – correct colour change for aqueous bromine 		

3d	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1 (2 chlorine atoms must be on 2 diff consecutive carbon atoms)
4a	Copper(II) oxide/ copper(II) hydroxide/ copper(II) carbonate R: copper	1
4b	Measuring cylinder/ pipette R: beaker	1
4c	To obtain a saturated solution (accept: to evaporate most of the water) R: to speed up the reaction	1
4d	To ensure that all acid has fully reacted. R: to ensure the acid is fully mixed	1
4ei	137 + 32 + 4 x 16 = 233 R: if units are given	1
4eii	5/233 = 0.02145 mol	1 ecf
4eiii	0.02145 mol	1 ecf
4eiv	0.02145 x [137 + 2(14 + 3 x16)] = 5.60 g	1 ecf
5a	Central Business District. Many cars on the road and a lot of carbon dioxide released from the exhaust fumes/ many smokers	1 1
5b	Lightning activity/ combustion of fuels at high temperature in car engines. R: cars	1
5c	It can cause breathing difficulties/irritates eves and skin.	1
5di	Place a blue litmus paper into the sample of rainwater.	1
	If the <u>blue litmus paper turns red</u> , acid rain is present.	1
	Add a few drops of <u>Universal Indicator</u> into the sample of	1
	rainwater. Universal Indicator changes from <u>green to red/orange</u> when acid rain is present.	1
	OR Add a metal. Effervescence is observed. Test for gas with a burning splint which should be extinguished with a 'pop' sound	
5dii	Calcium oxide (lime) / calcium hydroxide (slaked lime)	1
	It will neutralise the acid to form salt and water	1
	It this hourdined the dold to form built and water.	
6ai	Magnesium	1

6aii	Magnesium is able to displace nickel from nickel(II) chloride.	1
	R: magnesium is higher up in the reactivity series	
6aiii	Nickel can act as a barrier/ protective layer	1
	to prevent oxygen and water from coming in contact with iron.	1
	OR	
	Nickel can act as a sacrificial protection,	1
	corrode first in place of the iron metal.	1
6bi	The limestone decomposes to form <u>calcium oxide</u> .	1
	Calcium oxide removes impurity silicon dioxide (A: sand) as slag.	1
6bii	The carbon atoms/particles are of different size and disrupts the	1
	orderly arrangement of iron atoms.	
	Harder for layers of irons atoms/ions/particles to slide past one	1
	another easily.	
	1m max if no mention of atoms/ions/particles	