Question Number	Answer	Acceptable answers	Mark
1(a)(i)	{water vapour / steam} condensed/ changed to liquid	Allow steam cooled	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	(carbon dioxide) dissolved/ absorbed / trapped	Ignore refs to plants/ rocks	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(iii)	A description including the following points • (primitive) plants (produce oxygen) (1) • (by) photosynthesis (1)	Allow named plants Reject answers involving respiration	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)(i)	C		**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(ii)	all oxygen {reacted / used up} / excess copper (present)	no oxygen left / insufficient oxygen Reject not enough time / not hot enough	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(b)(iii)	volume gas used = 32-24 (1) = 8 (cm^3) percentage = 32-24/32 x 100 (1) = 25 (%)		**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)(iv)	oxygen in air in test tube also reacted /more than 32 cm^3 of air because of air in test tube / air in test tube will react but is not measured	some gases leaked out of apparatus allow another gas has reacted with copper	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(a)	A description including: • add (dilute) (hydrochloric) acid (1) • gas/carbon dioxide (passed into/tested) with limewater (1) • limewater goes milky / cloudy / white ppt (1)	correct formulae heat/thermally decompose bubbled through limewater dependent on use of limewater	**(3)**

Question Number	Answer	Acceptable answers	Mark
2(b)	40 +[2 x 35.5] (=111)	111 alone	**(1)**

Question Number	Answer	Acceptable answers	Mark
2(c)	• 100 (kg) (calcium carbonate) → 106 (kg) (sodium carbonate) (1) • $\dfrac{106 \times 40}{100}$ (1) (=42.4)	OR alternative 106÷100 40000÷100 /40÷100 (moles approach) Only 42.4 with no working worth 2 marks 42400**g** worth 2 marks	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(d)(i)	• 10.4/15.0 **(1)** • (10.4/15.0) x100 **(1)** (= 69.3)	69.3 alone worth 2 marks If no/incomplete working shown answer to 2 or more sf scores 2 marks Ignore any units	**(2)**

Question Number	Answer	Acceptable answers	Mark
2(d)(ii)	Two suggestions from		
	• reaction incomplete (1)	reversible	
	• impure reactants (1)		
	• other unwanted/side reaction(s) occur (1)	ignore by-products form	
	• product lost during experiment/practical (1)	could be an example eg some products left in apparatus	
		ignore generic experimental errors eg measuring/weighing errors/human error/spillage	**(2)**