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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer	Marks
1(a)	H_2S (1)	**1**
1(b)	MnO_4^- (1)	**1**
1(c)	NH_4^+ (1)	**1**

Question	Answer	Marks
2(a)(i)	0.155 – 0.190 (nm) (1)	**1**
2(a)(ii)	the melting point goes up and down (1)	**1**
2(b)	has **many** strong bonds (that have to be broken or overcome) / needs lots of energy to break or overcome **many** bonds (1)	**1**
2(c)(i)	aluminium oxide (dissolved) in (molten) cryolite (1)	**1**
2(c)(ii)	carbon / graphite (1)	**1**
2(c)(iii)	negative electrode: $Al^{3+} + 3e^- \rightarrow Al$ (1) positive electrode: $2O^{2-} \rightarrow O_2 + 4e^-$ (1)	**2**
2(d)	Al because it loses electrons (1)	**1**
2(e)	has a layer of oxide / aluminium oxide layer (1) layer is impermeable (to water) / coating is impermeable (to water) (1)	**2**

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Question	Answer	Marks
2(f)	use hydrochloric acid (1) use excess **aluminium** (1) filter (off aluminium) (1) leave filtrate in warm place / evaporate solution to point of crystallisation then leave / leave in the sun (1)	**4**

Question	Answer	Marks
3(a)	high melting point / high boiling point / high density / (good) conductor of electricity / (good) conductor of heat / malleable / ductile / hard / strong / sonorous (1)	**1**
3(b)(i)	simple covalent molecule / simple covalent molecular (1)	**1**
3(b)(ii)	$TiCl_4(l) + 2H_2O(l) \rightarrow TiO_2(s) + 4HCl(aq)$ balanced equation (1) state symbols – dependent on correct formulae (1)	**2**

Question	Answer	Marks
3(c)	**Process 1:** mol $TiCl_4$ = $\frac{1000}{190}$ **OR** 5.263 (1) **Process 2:** mass Ti = $\frac{1000}{190} \times 48$ **OR** 252.63 (1) **Process 3:** % = $\frac{1000}{190} \times 48 \times 0.9$ **OR** 227.36 / 230g **OR** **Process 1:** mol $TiCl_4$ = $\frac{1000}{90}$ **OR** 5.263 (1) **Process 2:** % = $\frac{90}{100} \times 5.263$ **OR** 4.736 (1) **Process 3:** mass = 4.736×48 **OR** 227.36 / 230 g	**3**

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Question	Answer	Marks
4(a)	One mark each for any three of: • fractional distillation • **petroleum** is heated / **petroleum** vaporised (into column) • idea of components / fractions with different boiling points • (fractions with) low boiling point come off at the top / (fractions with) high boiling point come off at the bottom / fractions come off at different levels (in the column)	**3**
4(b)	(surfacing) roads / (water-proofing) roofs (1)	**1**
4(c)(i)	idea that the formula fits C_nH_{2n+2} e.g. for $C_{12}H_{26}$ n=12 and 2n+2 is 26 (1)	**1**
4(c)(ii)	correct balanced equation e.g. $C_{12}H_{26} \rightarrow C_{12}H_{24} + H_2$ **OR** $C_{12}H_{26} \rightarrow H_2 + 3C_4H_8$ etc. (1)	**1**
4(d)	(hydrogen) does not form carbon dioxide (1) so does not lead to greenhouse effect / flooding / drought / climate change (1) **OR** water is the **only** product (1) so does not lead to greenhouse effect / flooding / drought / climate change (1) **OR** (hydrogen) renewable / sustainable (1) hydrogen is not finite (resource) / (the product water) can be split up (or electrolysed) to give hydrogen / hydrogen can be formed again from water (1)	**2**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)</td><td>
<table>
<tr><td>element</td><td>C</td><td>H</td><td>O</td></tr>
<tr><td>%</td><td>57.1</td><td>4.8</td><td>38.1</td></tr>
<tr><td>moles</td><td>4.76</td><td>4.8</td><td>2.38</td></tr>
<tr><td>simplest mole ratio</td><td>2</td><td>2</td><td>1</td></tr>
</table>
% of oxygen (1)
moles / mole ratio (1)
empirical formula C_2H_2O (1)
</td><td>3</td></tr>
<tr><td>5(b)</td><td>moles of KOH = 0.0185 × 0.250 OR 0.004625 (1)
moles of W = moles of KOH ÷ 3 OR 0.004625 ÷ 3 OR 0.00154 (1)
M_r = (0.194 / 0.00154) = 125.97 / 126 (1)</td><td>3</td></tr>
<tr><td>5(c)</td><td>$C_6H_6O_3$ (1)</td><td>1</td></tr>
</table>

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Question	Answer	Marks
6(a)	removal of salt(s) (from sea water) (1)	**1**
6(b)(i)	fertilisers (1)	**1**
6(b)(ii)	eutrophication (1)	**1**
6(c)(i)	filtration (1)	**1**
6(c)(ii)	carbon / charcoal (1)	**1**
6(c)(iii)	chlorine (1)	**1**

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Question	Answer	Marks
7(a)	ammonium iodide disappears / solid disappears / sample disappears / nothing left in tube (1)	**1**
7(b)	moles of ammonium iodide $\frac{2.9}{145}$ **OR** 0.02(00) (1) moles of gas = 2×0.02 **OR** 0.04(0) (1) volume of gas = $(0.04 \times 24) = 0.96\ dm^3$ **OR** $960\ cm^3$ (1)	**3**
7(c)	(acidified aqueous) silver nitrate (1) (pale) yellow ppt (1)	**2**
7(d)	$2I^-(aq) + Br_2(aq) \rightarrow I_2(aq) + 2Br^-(aq)$ correct formulae and balanced (1) correct state symbols – dependent on correct formulae (1)	**2**
7(e)	in solid ions cannot move (1) in aqueous / solution ions can move (1)	**2**

Question	Answer	Marks
8(a)	idea that no reactants or products can escape (1)	**1**
8(b)	Less NO_2 / concentration of NO_2 decreases / more NO / more O_2 (1) fewer moles **of gas** on the right hand side of the equation / fewer **gas** molecules on the right hand side of the equation (1)	**2**
8(c)(i)	the (forward) reaction releases heat / the (forward) reaction is exothermic (1)	**1**
8(c)(ii)	particles have less **kinetic** energy / particles moving slower (1) less successful collisions / less energetic collisions / less effective collisions / less particles with equal or above activation energy (1)	**2**
8(d)	correct structure (1)	**1**
8(e)	$2NO_2 + H_2O \rightarrow HNO_3 + HNO_2$ (1)	**1**
8(f)	strong acid completely dissociates / strong acid completely ionises (1) weak acid partially dissociates / weak acid partially ionises / little dissociation (1)	**2**

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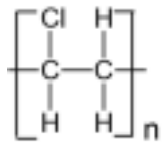
Cl
H
C
C
H
H
n

Question	Answer	Marks
10(a)	contains oxygen (atom) (1)	**1**
10(b)	does not have any carbon-carbon double bonds / **all** the carbon-carbon bonds are single bonds / the carbon-carbon bonds are **only** single bonds (1)	**1**
10(c)	**EITHER** test: Universal indicator (1) cyclobutanol: goes green / does not change colour (1) butanoic acid: goes red / orange or yellow (1) **OR** test: heat with named alcohol (1) cyclobutanol: no reaction (1) butanoic acid: gives sweet smelling compound (1) **OR** test: heat with named carboxylic acid (1) cyclobutanol: gives sweet smelling compound (1) butanoic acid: no reaction (1)	**3**
10(d)	M_r = 72 (1) % = 66.7 / 67 (1)	**2**

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Question	Answer	Marks
10(e)(i)	ethanoic acid / CH_3COOH (1)	**1**
10(e)(ii)	(acidified) potassium manganate(VII) (1)	**1**
10(e)(iii)	methanol (1)	**1**

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