SCOTTISH QUALIFICATIONS AUTHORITY

2004 Chemistry

Intermediate 1

Finalised Marking Instructions

Intermediate 1 Chemistry

General information for markers

The general comments given below should be considered during all marking.

1 Marks should **not** be deducted for incorrect spelling or loose language as long as the meaning of the word(s) is conveyed.

Example: Answers like 'distiling' (for 'distillation') and 'it gets hotter' (for 'the temperature rises') should be accepted.

2 A right answer followed by a wrong answer should be treated as a cancelling error and no marks should be given.

Example: What is the colour of universal indicator in acid solution?

The answer 'red, blue' gains no marks.

3 If a right answer is followed by additional information which does not conflict, the additional information should be ignored, whether correct or not.

Example: Why can the tube not be made of copper?

If the correct answer is related to a low melting point, and the candidate's answer is 'It has a low melting point and is coloured grey' this would **not** be treated as having a cancelling error.

4 Full marks should be awarded for the correct answer to a calculation on its own; the part marks shown in the marking scheme are for use when working is given.

5 A half mark should be deducted in a calculation for each arithmetic slip **unless stated otherwise in the marking scheme**.

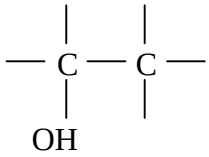
6 A half mark should be deducted for incorrect or missing units **only when stated in the marking scheme**.

7 Where a wrong numerical answer (already penalised) is carried forward to another step, no further penalty is incurred provided the result is used correctly.

8 Ignore the omission of one H atom from a full structural formula provided the bond is shown.

9 With structures involving an –OH or an $–NH_2$ group, a half mark should be deducted if the 'O' or 'N' are not bonded to a carbon, i.e. $OH–CH_2$ and $NH_2–CH_2$.

10 When drawing structural formulae, a half mark should be deducted if the bond points to the 'wrong' atom, eg



11 A symbol or correct formula should be accepted in place of a name **unless stated otherwise in the marking scheme**.

12 When formulae of ionic compounds are given as answers it will only be necessary to show ion charges if these have been specifically asked for. However, if ion charges are shown, they must be correct. If incorrect charges are shown, no marks should be awarded.

13 If an answer comes directly from the text of the question, no marks should be given.

Example: A student found that 0·05 mol of propane, C_3H_8 burned to give 82·4 kJ of energy.

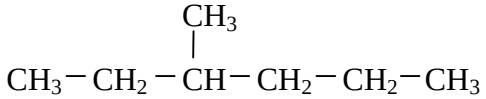
$$C_3H_8(g) + 5O_2(g) \longrightarrow 3CO_2(g) + 4H_2O(l)$$

Name the kind of enthalpy change which the student measured.

No marks should be given for 'burning' since the word 'burned' appears in the text.

14 A guiding principle in marking is to give credit for (partially) correct chemistry rather than to look for reasons not to give marks.

Example 1: The structure of a hydrocarbon found in petrol is shown below.



Name the hydrocarbon.

Although not completely correct, the answer '3, methyl-hexane' should gain the full mark ie ignore wrong use of commas and dashes.

Example 2: A student measured the pH of four carboxylic acids to find out how their strength is related to the number of chlorine atoms in the molecule. The results are shown.

Structural formula	**pH**
CH_3COOH	1·65
$CH_2ClCOOH$	1·27
$CHCl_2COOH$	0·90
CCl_3COOH	0·51

How is the strength of the acids related to the number of chlorine atoms in the molecule?

Although not completely correct, an answer such as 'the more Cl_2, the stronger the acid' should gain the full mark.

15 Unless the question is clearly about a non-chemistry issue, eg costs in industrial chemistry, a non-chemical answer gains no marks.

Example: Why does the (catalytic) converter have a honeycomb structure?

A response such as 'to make it work' may be correct but it is not a chemical answer and the mark should not be given.

16 When it is very difficult to make a decision about a partially correct answer, a half mark can be awarded.

17 When marks have been totalled, a half mark should be rounded up.

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Marking scheme

Section A

1.	A	11.	A
2.	C	12.	C
3.	D	13.	D
4.	A	14.	B
5.	B	15.	D
6.	D	16.	C
7.	A	17.	B
8.	C	18.	C
9.	B	19.	B
10.	D	20.	A

Section B

Question	Acceptable Answer	Mark	Worth 1/2	Worth 0
1	Molecules or ions column correct (1) Other columns correct (1)	**2**	Atoms only correct	
2 (a)	(Low voltage) source of electricity or battery and bulb or buzzer or ammeter	**1**	Either source or bulb	
(b)	Both table entries correct ie metal and conductor	**1**	One correct table entry	

Question	Acceptable Answer	Mark	Worth 1/2	Worth 0
3 (a)	A resource which will eventually run out or will not last forever or cannot be replaced	**1**		
(b)	Kills fish or causes damage to marine life or kills birds/animals or covers beaches in oil	**1**	Causes pollution	
(c) (i)	Carbon and hydrogen with no other element mentioned	**1**	Carbon with one element other than hydrogen or hydrogen with one element other than carbon or carbon and hydrogen with one other element mentioned	
(ii)	Distillation or distilling (fractional – not required)	**1**		

Question	Acceptable Answer	Mark	Worth 1/2	Worth 0
4 (a)	Concentration	**1**		Volume or amount
(b)	Speed it up or increase the reaction speed or make it go faster	**1**		
(c)	Oxygen	**1**		
5 (a)	Peas or clover or beans or legumes	**1**		
(b)	They are soluble or will dissolve in water	**1**		

Question	Acceptable Answer	Mark	Worth 1/2	Worth 0
6 (a)	Each point worth ½ mark x axis labelled temperature correct scaling on x axis points plotted correctly (allow 1 error) points joined errors (-½ per error) if not 50% of paper used if bar graph drawn (candidates not penalised for extending graph to origin)	**2**		
(b)	Answer from candidate's graph + or - ½ box tolerance (expected answer 54-58)	**1**		
7 (a)	Neutralisation	**1**		
(b) (i)	Delivery tube into test tube containing limewater with tube end below surface of liquid and liquid labelled limewater	**1**	Diagram with one error eg delivery tube above liquid level or failure to label limewater	
(ii)	Limewater will turn milky or go cloudy/chalky/white	**1**		

Question	Acceptable Answer	Mark	Worth 1/2	Worth 0
8 (a)	Required for body growth or repair	**1**		
(b)	Nitrogen, N, (N_2 accepted)	**1**		
(c)	pH paper will turn blue or purple	**1**		
9 (a)	All four entries correct ie Brandy Wine Whisky Beer	**2**	Any two entries correct for 1 mark	One correct entry
(b)	Fermentation or fermenting	**1**		
(c)	5 hours	**1**		
(d)	Colouring or a bad taste	**1**	Bad smell	Poisonous substance

Question	Acceptable Answer	Mark	Worth 1/2	Worth 0
10 (a) (i)	Zinc + Steam → Zinc oxide + Hydrogen	**1**	= instead of arrow	
(ii)	It does not dissolve in water or It is insoluble	**1**	Lighter than water	
(iii)	It burns with a pop Lighted splint gives a pop	**1**		
(b)	The speed of reaction will increase or It will become faster/quicker	**1**		

Question	Acceptable Answer	Mark	Worth 1/2	Worth 0
11 (a)	Sugars are soluble – starches are insoluble or sugars are sweet – starches are not or starch gives slow energy release or starch has big molecules	**1**		
(b) (i)	Need to place test tubes in beaker of hot water or tubes must be heated	**1**		Any idea of pouring into beaker of hot water
(ii)	Benedict's turns orange/red/brown	**1**		
(c) (i)	Carbon dioxide	**1**		
(ii)	Provides energy/keeps us warm or helps maintain the balance of oxygen carbon dioxide in the atmosphere or keeps carbon cycle going	**1**		

Question	Acceptable Answer	Mark	Worth 1/2	Worth 0
12 (a)	Put salt water and rust indicator into each beaker (½ mark) Put iron wire into one beaker (½ mark) and plastic coated iron wire into the other beaker (½ mark) The rust indicator will turn blue (change colour) in the beaker with the iron wire but not in the beaker with the plastic-coated iron wire (½ mark)	**2**		
(b) (i)	Ethene	**1**		
(ii)	A thermoplastic	**1**		

[END OF MARKING INSTRUCTIONS]