2013 Chemistry

Intermediate 1

Finalised Marking Instructions

Part One: General Marking Principles for Chemistry Intermediate 1

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

(a) Marks for each candidate response must <u>always</u> be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor.

(b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: Chemistry Intermediate 1

The marking schemes are written to assist in determining the "minimal acceptable answer" rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates' evidence, and apply to marking both end of unit assessments and course assessments.

General information for markers

The general comments given below should be considered during all marking. It should be noted that these are general marking principles and may be superseded by decisions made at the Markers' Meeting.

1. Markers are reminded to read candidate responses **in their entirety**. If the candidate shows a clear understanding of the chemistry but does not use the exact words of the Marking Instructions they should still be given credit.

2. Markers are reminded that **no** comments are to be written on scripts. Comments such as 'ARITH', 'ERROR' and 'BOD' (Benefit of doubt) are **not** acceptable.

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

   Example: A student measured the pH of four carboxylic acids to find out how the 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.

4. 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 “hydrolic acid” (for “hydrochloric acid”) and “it gets hotter” (for “the temperature rises”) should be accepted.

   However the example below would not be acceptable, as an incorrect chemical term, which the candidate should know, has been given.

   Example: If the correct answer is “polyethene”, and the candidate’s answer is “polyethane”, this should not be accepted.

5. 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.

6. If a right answer is followed by additional information which does not conflict, the additional information should be ignored, whether correct or not. However, if selecting information from the Data Booklet is required, the information selected must be relevant and correct, as this would negate.

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

8. A half mark should be deducted in a calculation for each arithmetic slip.

9. A half mark should be deducted for incorrect or missing units **only when stated in the Marking Instructions.**

10. A half mark should be deducted for transcription errors.

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

12. A symbol or correct formula should be accepted in place of a name **unless stated otherwise in the Marking Instructions.**

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

    Example: Propane burns to give out energy.

    Name the type of chemical reaction taking place.

    No marks should be given for “burning” since the word “burns” appears in the text.

14. 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.

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

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

Part Two: Marking Instructions for each Question

Section A

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
1			D			
2			A			
3			A			
4			C			
5			D			
6			B			
7			D			
8			C			
9			C			
10			B			
11			B			
12			D			
13			A			
14			A			
15			C			

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
16			**B**			
17			**C**			
18			**D**			
19			**B**			
20			**A**			

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
1	**a**	**i**	I/I_2 No follow through to part (ii)	**1**		
1	**a**	**ii**	Fluorine/F/F_2 Chlorine/Cl/Cl_2 Bromine/Br/Br_2 Astatine/At/At_2 f/cl/br/f2/CI2/br2	**1**		Any mention of non - group 7 element
1	**b**		Food preservative/make it last longer/ Supply vitamins/supply minerals Food flavouring/ Food colouring Keep fresher for longer/ Change the taste/ Add nutrients/ Change texture Taste better/ smell better/ to give us more essentials	**1**		Make food look better/ look nice/ work better/ makes food fresh
1	**c**		Increased demand for food More people need more food	**1**	more people	
2	**a**		Carbon and chlorine C and Cl/Cl_2 Both correct for 1 mark Recognisable symbol	**1**		Carbon and chloride/ carbon, chlorine and oxygen or any other element or water
2	**b**		1933	**1**		33
2	**c**		$C_2H_3Cl_3$ Numbers to be subscript	**1**	C2H3Cl3/ $C^2H^3Cl^3$	

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
3	**a**		Temperature (of the water) Heat (of water) How hot the water is	**1**		Any mention of speed - cancels/ Repetition of aim
3	**b**		Number of upturns/ Number of shakes	**1**		Number of stirs Time Time shaken Number of mixes
3	**c**		Faster/ Speeds it up It increases/ Time goes down Increases rate	**1**		Speed will change/ Any mention of melting Acts as a catalyst – cancels More sugar dissolves
4	**a**		Circle – goes up towards 7	**1**		
4	**b**	**i**	Test tube B Can also be circled on grid	**1**		
4	**b**	**ii**	Universal indicator/ pH indicator/ pH paper pH probe/ pH meter/ pH solution/ pH scale/ pH chart/ pH test/ pH indicator plus correct colour (yellow or green)/ pH 7 Accept ph	**1**		Indicator/ pH indicator and iodine etc./ No more bubbles given off/ Colour on its own- yellow, green, red, blue pH indicator and incorrect colour Hp paper

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
5	**a**		Calcium phosphide + water ↓ calcium hydroxide + diphosphane + hydrogen reactants in any order products in any order all correct for 1 mark Recognisable spelling - diphosphate/ Correct formulae (H_2)	**1**		H for hydrogen Calcium phosphate
5	**b**		Flammable symbol Can be ticked	**1**		Flammable plus another symbol circled
6	**a**		Alloy Allow loose spelling	**1**		Compound
6	**b**		B May be circled on chart	**1**		
6	**c**		Silver/ Gold/ Platinum/ Mercury	**1**		Correct answer plus any other incorrect answer
7	**a**		(Measured with a) ruler Ruler and number of drops cm Metre stick/tape Measuring stick	**1**		Measuring cylinder/ Ruler and (or) measuring cylinder Test-tube with markings on it

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
7	**b**		Temperature (of water)/ (Type of) detergent/ Number of shakes/ Concentration of detergent/ (Size of) test tube/ Volume of test tube/ Time (of shaking)/ Amount of shakes/ Heat (of water)/ Hardness of shaking/ Speed of shaking/ (Type of) test tube Test tube	**1**		Same size of measuring cylinder
7	**c**		(Forms a) scum	**1**		
8	**a**		Carbon and hydrogen/ C and H/H_2 Both correct for 1 mark Recognisable symbol	**1**		
8	**b**		Combustion Exothermic Incomplete combustion	**1**		Burning/ Heat given off
8	**c**		Not enough/ Limited amount/ Poor supply/ Low level/ Less oxygen/ Not very much/ Not a lot Not a lot of oxygen in the candle or in the air/ Just enough oxygen	**1**		Oxygen used up/ Oxygen decreases/ Needs very little oxygen to burn

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
9	**a**		Man-made/ Made by (chemical) industry/ Made by scientists or humans/ Artificial Made by chemists	**1**		Made by factories/ Processed/ Chemically made/ Unnatural/ Not natural/ Created by humans/ Made using chemicals
9	**b**		Propene	**1**		
9	**c**		Toxic gases given off/ Makes poisonous gases/ Makes carbon monoxide/ Toxic flames	**1**		Harmful gases/ Pollution/ Global warming/ Harms the environment/ Damage to animals/ Makes carbon dioxide/ Dangerous gases/ Thick black smoke/ Soot given off and dangerous if inhaled/ Wasting resources None cancel
10	**a**		% (percentage) label ½ mark Scale on % axis ½ mark Bars labelled (abriev. Accepted) ½ mark Correct height of bars ½ mark Allow ½ box tolerance Allow 1 plotting error – ½ mark for using less than half graph paper Line graph – maximum of 1 mark for label and scale Class of food label not required Bars can be different widths Spaces between bars can be different	**2**		

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
10	**b**	**i**	$\frac{4}{100}\times 50$ ½ mark = 2 ½ mark 2 on its own 1 mark	**1**	only working shown $\frac{4}{100}\times 50$ Arithmetic error	
10	**b**	**ii**	To keep the gut working/ Stops constipation/ Keeps bowels healthy/ Helps digestive system/ Good for the gut/ To keep your body going to the toilet/ Stops bowel disorder Helps clear body waste/ Keeps food passing through the gut	**1**		Provide healthy nutrients/ Keep you healthy/ Give you energy/ Keep body strong/ Indigestion/ Growth and repair/ Helps digest food/ Breaks down food/ Stops diarrhoea/ Healthy insides None cancel

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
11	**a**		Plants/ Fish/ Vegetable/ Marine/ Seafood/ Flowers/ Nuts/ Any named plant/vegetable or marine source	**1**		Dairy/ Fruit Chocolate/pizza/ Chips/humans None cancelling
11	**b**	**i**	Obese Accept loose spelling	**1**		
11	**b**	**ii**	$\frac{100}{2\times2}$ ½ mark = 25 ½ mark 25 on its own for 1 mark	**1**	Working only $\frac{100}{2\times2}$ Arithmetic error 4/100 = 25 100 ÷2x2	
12	**a**		Mashing yeast Carbon dioxide recognisable formula Vinegar ½ mark for each one	**2**		
12	**b**		Fermentation/ Fermenting	**1**		Distillation/ Respiration / defermentation
12	**c**		Ethanol Allow for loose spelling	**1**		Named alcohol e.g. vodka, gin

Question			Acceptable Answer/s	Max Mark	½ mark	Unacceptable
13	**a**		Nitrogen/ N/ N_2 Recognisable symbol	**1**		
13	**b**		Blue/ Purple/ Bottom turns blue and top stays yellow	**1**		blue + red/yellow/green blue-green

[END OF MARKING INSTRUCTIONS]