SCOTTISH QUALIFICATIONS AUTHORITY

2001 Chemistry SG Credit
Finalised Marking Instructions

Strictly Confidential

These instructions are **strictly confidential** and, in common with the scripts entrusted to you for marking, they must never form the subject of remark of any kind, except to Scottish Qualifications Authority staff. Similarly, the contents of these instructions must not be copied, lent or divulged in any way now, or at any future time, to any other persons or body.

Markers' Meeting

You should use the time before the meeting to make yourself familiar with the question paper, instructions and any scripts which you have received. Do **not** undertake any final approach to marking until **after** the meeting. Please note any points of difficulty for discussion at the meeting.

Note: These instructions can be considered as final only after the markers' meeting when the full marking team has had an opportunity to discuss and finalise the document in the light of a wider range of candidates' responses.

Marking

The utmost care must be taken when entering and totalling marks. Where appropriate, all summations for totals must be carefully checked and confirmed.

Where a candidate has scored zero marks for any question attempted, "0" should be entered against the answer.

Recording of Marks

The mark for each **question**, where appropriate, should be entered **either** on the grid provided on the back page of the answer book, **or** in the case of question/answer books, on the grid (if provided) on the last page of the book. Where papers assess more than one element, care must be taken to ensure that marks are entered in the correct column.

The **Total** mark for each paper or element should be entered (in red ink) in the box provided in the top-right corner of the front cover of the answer book (or question/answer book).

Always enter the **Total** mark as a **whole number**, where necessary by the process of rounding up.

The transcription of marks, within booklets and to the Mark Sheet, should always be checked.

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24 May 2001

Standard Grade Chemistry
Credit

Part 1 – 20 marks

1	a	E	1 or 0	
	b	A	1 or 0	
2	a	A and F	1 or 0	CLOSED
	b	B	1 or 0	
3	a	C and E	1 or 0	CLOSED
	b	B and F	1 or 0	CLOSED
	c	D and E	1 or 0	CLOSED
4	a	D	1 or 0	
	b	C	1 or 0	
	c	E	1 or 0	
5	a	A and D	1 or 0	CLOSED
	b	F	1 or 0	
6		A and C	2 or 1 or 0	OPEN
7		B and D	2 or 1 or 0	OPEN
8		A and B	2 or 1 or 0	OPEN
9		A and C	2 or 1 or 0	OPEN

Please note that there are **NO HALF MARKS** in Part 1.

Part 2 – 40 marks

		Accept	Marks	Not Accepted
10	a	no effect or decolourises slowly	1 mark	
	b	cyclohexane	1 mark	
	c	isomers	1 mark	
11	a	hydrogen or H_2	1 mark	H
	b	W = platinum or gold or silver or mercury (or symbol) Y = group 1 or 2 metal (or symbol)	½ mark ½ mark	beryllium or iron
	c	Y, X, Z, W W, Z, X, Y if labelled slowest → fastest	1 mark	4 named metals
	d	reduction or redox	1 mark	displacement or decomposition or smelting reduction and displacement ie displacement acts as cancelling error

		Accept	Marks	Not Accepted
12	a	$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ or multiples etc	1 mark	
	b	to prevent formation of acid rain or acid or sulphurous acid or sulphuric acid or SO_2 poisonous or toxic pollutant	1 mark	harmful dangerous purify it causes damage to atmosphere
	c	$2H_2S + SO_2 \rightarrow 2H_2O + 3S$		
		2 mol 3 mol 68g 96g 34g $\frac{34}{68} \times 96$ $= 48$ g	½ mark ½ mark ½ mark ½ mark	
		deduct ½ mark if wrong units quoted each step subsumes previous one deduct ½ mark for arithmetic error		
		accept 48g without working if working is shown then examine it closely if atomic numbers are used (45·3g) – maximum of 1 mark if another chemical is used rather than sulphur – maximum of 1 mark		using 2 wrong chemicals

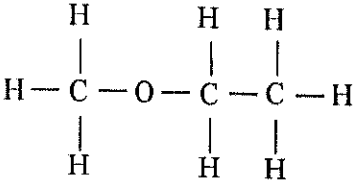
		Accept	Marks	Not Accepted
d	(i)	both labels and units both scales plotting to within ± ½ box – allow 1 error joining points – allow 1 slip allow plot of 'temperature against solubility' must use at least ½ paper in each direction spike graph – maximum of 1½ marks (ignore spikes and apply scheme) bar graph – maximum of 1 mark if table numbers used as scale points – maximum of 1 mark deduct ½ mark if scale points on either axis are wrong way round eg scale points on temperature axis labelled '100 down to 0' rather than '0 up to 100'	½ mark ½ mark ½ mark ½ mark	
	(ii)	as temperature increases solubility decreases less soluble at higher temperatures or vice versa statement must be in terms of 'solubility being dependant on temperature' rather than 'temperature dependant on solubility'	1 mark	more soluble at 0°C any reference to rates temperature dependant on solubility eg as solubility decreases temperature increases

			Accept	Marks	Not Accepted
13	a	(i)	ammonium phosphate	1 mark	ammonia phosphate
		(ii)	add or replace or supply essential elements or elements for plant growth or nutrients or named nutrient to improve yield	1 mark	to make more to help them grow to neutralise it to enrich or make it more fertile to feed plants to add to natural cycle
	(b)		Nitric acid or HNO_3	1 mark	
	(c)	(i)	sets when heated or cannot be reshaped by heating or does not melt when heated heated once but not reshaped on reheating inflexible on heating (there must be a mention of heat)	1 mark	cannot be reshaped cannot be put back into shape

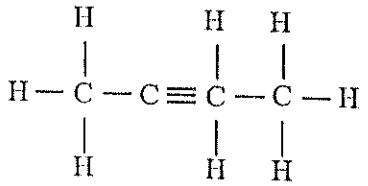
			Accept	Marks	Not Accepted
13	c	(ii)	Formula mass = 12 + 16 + 28 + 4 = 60	1 mark	
			$\% N = \frac{28}{60} \times 100$	½ mark	
			= 46·7 or 46·6 or 47	½ mark	
			deduct ½ mark if 14 used rather than 28		
			accept correct answer without working		
			if atomic numbers are used (43·7 or 43·75 or 43·8 or 44) – maximum of 1 mark even without working		
			correct % N in other compounds – maximum of 1 mark		

		Accept	Marks	Not Accepted
14	a	Dead Sea water contains more ions or more metal ions or more of every type of ion except SO_4^{2-} Dead Sea water contains twice as many ions	1 mark	Dead Sea water is heavier
	b	any suitable compound using the ions in the table or its correct formula if ionic charges are shown they must be correct	1 mark	salt
	c	no of moles of calcium ions = $\frac{0 \cdot 4}{40} = 0 \cdot 01$	½ mark	
		concentration = 0·01 accept correct answer without working if Dead Sea water used – maximum of ½ mark	½ mark	

		Accept	Marks	Not Accepted
15	a	from right to left on wire or above ammeter (must be clear that candidate means wire and not ion bridge) if written statement then 'R → L through wire'	1 mark	'right to left' as written statement
	b	(i) oxidation	1 mark	
		(ii) decreases or goes down or turns acidic or falls below 7	1 mark	decreases towards 7 or turns red
	c	$Br_2 + 2e^- \rightarrow 2Br^-$ allow 1 lower case br ignore state symbols	1 mark	$Br + e^- \rightarrow Br^-$
16	a	iron or Fe	1 mark	steel wool or platinum or iron oxide
	b	ammonium compound (including ammonium hydroxide) + alkali if formulae are given they must be correct	1 mark	
	c	the positive nuclei are attracted to the negative electrons answer must imply two atoms or nuclei positive nucleus attracted to negative electrons protons and electrons attract nucleus and electrons attract } ½ mark for attraction	1 mark	sharing outer electrons to become more stable

		Accept	Marks	Not Accepted
17	a	compounds with the same general formula <u>AND</u> similar chemical properties or properties or reactions	1 mark	(gradation in) physical properties instead of chemical properties
	b	(i) hydrogen or H_2	1 mark	
		(ii)  allow 1 missing H or bond	1 mark	

		Accept	Marks	Not Accepted
18	a	precipitation	1 mark	
	b	$Ca^{2+}(OH^-)_2$ or $Ca^{2+}(OH^-)_2$ (aq) $Ca^{2+} + 2OH^-$ or $Ca^{2+}(aq) + 2OH^-(aq)$	1 mark	$Ca^{2+}(aq)(OH^-)_2$ $Ca^{2+} + (OH^-)_2$ or $Ca^{2+}(aq) + (OH^-)_2(aq)$
	c	carbon monoxide (or CO) or carbon dioxide (or CO_2)	1 mark	
	d	ions free to move	1 mark	electrons or charged particles instead of ions

		Accept	Marks	Not Accepted
19	a	C_nH_{2n-2} $C_nH_n + {}_{n-2}$ or correct variation	1 mark	
	b	(i)  allow one missing H or bond allow shortened structural formula if C≡C is shown	1 mark	
		(ii) the two bromine atoms are not next to each other any statement which implies bromine atoms are not in correct position it would give 2 double bonds	1 mark	bromine molecules or ions unacceptable for bromine atoms

[END OF MARKING INSTRUCTIONS]

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