SCOTTISH
QUALIFICATIONS
AUTHORITY

2001 Chemistry SG General
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

2001 Standard Grade Chemistry
General Level

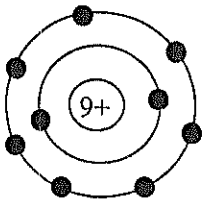
Marking Instructions

Part 1 – 20 marks

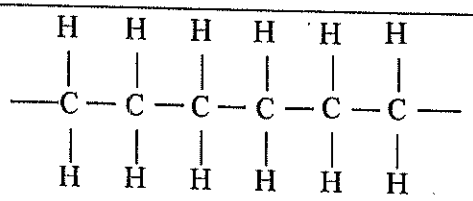
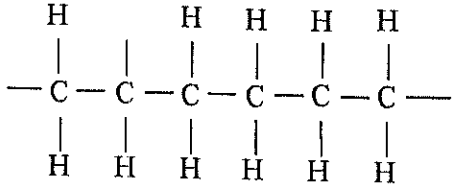
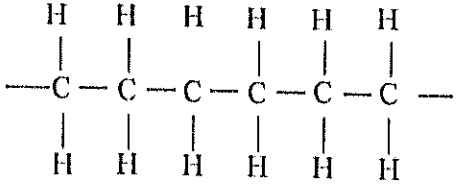
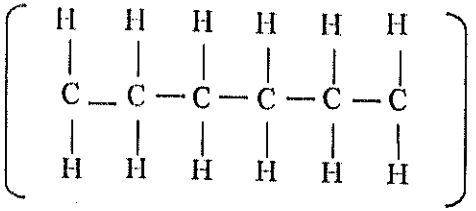
1	a	C		1 or 0	
	b	A and B	both for	1 or 0	CLOSED
	c	E		1 or 0	
2	a	D		1 or 0	
	b	A		1 or 0	
	c	B		1 or 0	
3	a	A and C	both for	1 or 0	CLOSED
	b	A and F	both for	1 or 0	CLOSED
	c	B		1 or 0	
4	a	C		1 or 0	
	b	E		1 or 0	
	c	D and F	both for	1 or 0	CLOSED
5	a	B		1 or 0	
	b	A		1 or 0	
6	a	B		1 or 0	
	b	A		1 or 0	
	c	D		1 or 0	
	d	E and F	both for	1 or 0	CLOSED
7		B 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
8	a	2 electrons on the 1st energy level, 7 on the 2nd electrons must be on lines  crosses or e acceptable as electrons	1 mark	
	b	same number of protons and electrons No of +ve charges (or nuclear charge) equals (or cancels or balances) No of electrons	1 mark	neutralises negative neutrons – conflicting incorrect answers no overall charge +ve protons & -ve electrons with no mention of cancelling same charge of protons & electrons

			Accept	Marks	Not Accepted
9	ii	(i)	for CO_2: below 7 or acid or appropriate colour	½ mark	low pH acid then wrong colour given (cancelling error)
			for Na_2O: above 7 or alkali or appropriate colour	½ mark	high pH alkali then wrong colour given (cancelling error)
		(ii)	insoluble or does not dissolve figure quoted from data booklet	1 mark	insoluble solution
	b		$Na + O_2 \longrightarrow Na_2O$ deduct ½ mark for each incorrect entry Ignore charges (even wrong ones) deduct ½ mark for = sign or missing → do not penalise if + sign missing Ignore attempts at balancing	1 mark	NA as symbol for Sodium – penalise only once if same mistake is made

	Accept	Marks	Not Accepted
10 a		1 mark	H on either end any structure other than one containing 6 carbons
	allow dots at end instead of bonds		
	allow one missing H eg 		
	allow one mising bond eg 		
	deduct ½ mark for one or both end bonds missing		
	allow  n		
	with or without n		

		Accept	Marks	Not Accepted
10	b	thermoplastic or thermaplastic	1 mark	malleable or softening
	c	correct % scale	½ mark	
		correct labelling of bars	½ mark	
		bars correctly drawn to within ± ½ box	1 mark	
		deduct ½ mark for each wrong bar up to a maximum of 1 mark		
		deduct ½ mark if less than half graph paper area used		
		vertical scale should start at zero		
		allow topless bars		
		allow bars of different widths		
		spike graph acceptable (apply scheme)		
		line graph maximum of 1 mark (apply scheme)		

		Accept	Marks	Not Accepted
11	a	speed up a reaction lower temperature lowers activation energy	1 mark	saves money or cheaper more economical saves energy not been used up makes reaction easier (above only acceptable with correct answer) slows down reaction speeds up and/or slows down reaction
	b	as temperature increases % SO_2 decreases at higher temperatures less is converted and vice versa trend described in terms of SO_3 is acceptable if correct some detail is allowed as long as trend is clear	1 mark	goes down 'blow by blow' account temperature dependant on % SO_2 eg less SO_2 converted the higher the temperature
	c	produces acid rain any mention of acid forming pollutant poisonous or toxic gas ignore extra references to global warming/ozone layer	1 mark	harmful or hazardous harmful to environment harmful to humans corrosive causes breathing problems dissolves buildings and statues

	Accept	Marks	Not Accepted
11 d		½ mark	bar graph etc
	headings	½ mark	item as heading
	entries	1 mark	
	(deduct ½ mark for each wrong entry up to a maximum of 1 mark)		
	entries do not need to be in decimal form		

		Accept	Marks	Not Accepted
12	a	electrolysis (ignore spelling) electrolysing electrolisation splitting up compound using electricity	1 mark	redox electroplating electrochemical
	b	copper or copper ions positive opposites attract copper ions need (to gain) electrons negative electrode needs positive ions ions positive reduction is taking place	1 mark	copper atoms positive metals are formed at negative electrode
	c	bubbles or fizzing or effervescence or gas chlorine gas or chloride gas or oxygen gas chlorine (or Cl_2) or Oxygen (O_2)	1 mark	carbon gas chloride wrong gas named bubbles of air
	d	conductor of electricity conductor it conducts electricity can flow	1 mark	

		Accept	Marks	Not Accepted
13	ii	oxygen or O_2	1 mark	O on its own
	b	same	1 mark	
	c	Fe^{2+} or Fe^{3+} or Fe^{+2} or Fe^{+3} $Fe^{2+}O^{2-}$ or $(Fe^{3+})_2(O^{2-})_3$	1 mark	charges at bottom of symbol
		$Fe \rightarrow Fe^{2+} + 2e$ or $Fe - 2e \rightarrow Fe^{2+}$ $Fe \rightarrow Fe^{3+} + 3e$ or $Fe - 3e \rightarrow Fe^{3+}$ $Fe^{2+} \rightarrow Fe^{3+} + e$ or $Fe^{2+} - e \rightarrow Fe^{3+}$		ion-electron equations wrong way round
14	a	(i) Ostwald or catalytic oxidation of NH_3	1 mark	
		(ii) Water or H_2O	1 mark	hydrogen
	b	fertilisers or explosives	1 mark	fireworks heat with alkali to produce ammonia

			Accept	Marks	Not Accepted
15	a	(i)	chemical reaction or reaction chemical react or chemicals used up chemical energy converted to electrical energy redox displacement	1 mark	electrons flow ions flow chemicals mix cells react corrosion takes place to produce electrons reaction between two metals
		(ii)	portable or safer	1 mark	renewable DC rather than AC doesn't use up as much fossil fuels cheaper (cancels out safer or portable)
	b	(i)	from iron to copper arrow must be near to wire and above potato accept written statement 'iron to copper' or 'left to right'	1 mark	arrow on potato
		(ii)	increase or higher or stronger	1 mark	

		Accept	Marks	Not Accepted
16	a	40	1 mark	
	b	same volume of gas $40cm^3$ level off at same height or volume answer must imply same volume of gas	1 mark	lines join up finish or level off at same point or place
	c	slope B steeper line B above line A reaches 40 in quicker time more gas given off	1 mark	
	d	0·2 or the same	1 mark	

		Accept	Marks	Not Accepted
17	a	fractional distillation or distillation or fractionating	1 mark	fractioning or fractionalisation cracking or refining
	b	petrol	1 mark	
	c	using liquid in burette	½ mark	
		time for set volume or volume in set time	½ mark	
		repeat or do same experiment	½ mark	
		statement relating time to viscosity or compare times or results	½ mark	
		accept 2 burettes being used although only one shown		

			Accept	Marks	Not Accepted
18	a	(i)	two atoms joined together contains two atoms or pairs of atoms	1 mark	2 double atoms
		(ii)	covalent or sharing outer electrons ignore 'double' etc if covalent mentioned eg 'double covalent bond' is acceptable	1 mark	single or double or triple bond
	b	(i)	increases	1 mark	
		(ii)	above 184	1 mark	

[END OF MARKING INSTRUCTIONS]

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