Past Papers
Standard Grade
General
Chemistry

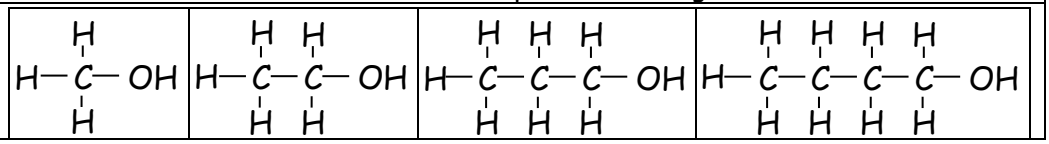
2002
Marking Scheme

2002 General	KU		PS	
	/30	%	/30	%
3	17+	57%	19+	63%
4	12+	40%	15+	50%
5	9+	30%	12+	40%
7	<9	<30%	<12	<40%

2002 Standard Grade Chemistry General Marking Scheme

Question	Answer	Chemistry Covered
1a	B	<table><tr><td>Group</td><td>1</td><td>7</td><td>0</td><td>Block Between Groups 2+3</td></tr><tr><td>Name</td><td>alkali metals</td><td>halogen</td><td>noble gases</td><td>transition metals</td></tr></table>
1b	A	Elements with atomic number of 85 and 87 and elements with atomic number above 92 are made by scientists. Curium has an atomic number of 96.
1c	E	Ammonia + Oxygen $\xrightarrow[\text{catalyst}]{\text{platinum}}$ Nitrogen Dioxide + Water Nitrogen Dioxide dissolves in Water to make Nitric Acid
2a	B	ACID + METAL $\longrightarrow$ SALT + HYDROGEN
2b	E+F Both for 1 mark	Diatomic molecules are 2 atoms joined together by one or more bonds.
2c	A	Carbon monoxide is a poisonous gas produced by incomplete combustion when there is a limited supply of oxygen.
3a	A+B Both for 1 mark	Cracking breaks saturated hydrocarbons into smaller hydrocarbons, some of them have C=C double bonds. Propene has 3 carbons and any answer with more than 3 carbons must be incorrect.
3b	B+F Both for 1 mark	<table><tr><td>Formula</td><td>CH_4</td><td>C_2H_4</td><td>C_6H_{14}</td><td>C_5H_{12}</td><td>C_4H_{10}</td><td>C_4H_8</td></tr><tr><td>Name</td><td>methane</td><td>ethene</td><td>hexane</td><td>pentane</td><td>butane</td><td>butene</td></tr><tr><td>Saturation</td><td>(alkane) saturated</td><td>(alkene) **unsaturated**</td><td>(alkane) saturated</td><td>(alkane) saturated</td><td>(alkane) saturated</td><td>(alkene) **unsaturated**</td></tr></table>
3c	C	<table><tr><td>Formula</td><td>CH_4</td><td>C_2H_4</td><td>C_6H_{14}</td><td>C_5H_{12}</td><td>C_4H_{10}</td><td>C_4H_8</td></tr><tr><td>Name</td><td>methane</td><td>ethene</td><td>hexane</td><td>pentane</td><td>butane</td><td>butene</td></tr><tr><td>Boiling Pt</td><td>-162°C</td><td>-104°C</td><td>**69°C**</td><td>36°C</td><td>-1°C</td><td>-6°C</td></tr></table>
4a	B	carbon dioxide + water $\xrightarrow[\text{light}]{\text{chlorophyll}}$ glucose + oxygen $6CO_2 + 6H_2O \longrightarrow C_6H_{12}O_6 + 6O_2$
4b	C	Fractional distillation separates substances with different boiling points
4c	D+E Both for 1 mark	Electroplating: Preventing corrosion by covering metal is less reactive metal Galvanising: Prevents corrosion of iron by sacrificial protection by zinc layer
5a	A+C Both for 1 mark	<table><tr><th>Ending</th><th>Meaning</th><th>Example</th></tr><tr><td>-ide</td><td>2 elements in compound</td><td>Copper sulphide = copper + sulphur</td></tr><tr><td>-ate</td><td>2 elements in compound + oxygen</td><td>Copper sulphate = copper + sulphur + oxygen</td></tr><tr><td>-ite</td><td>2 elements in compound + oxygen</td><td>Sodium sulphite = sodium + sulphur + oxygen</td></tr></table>
5b	A	Acids are neutralised by bases: metal hydroxides (alkalis) metal oxides metal carbonates
6a	B	<table><tr><td>A</td><td>Redox</td><td>$2H^+ + Mg \rightarrow Mg^{2+} + H_2$</td></tr><tr><td>B</td><td>Combustion</td><td>$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$</td></tr><tr><td>C</td><td>Addition</td><td>$C_2H_4 + Br_2 \rightarrow C_2H_4Br_2$</td></tr><tr><td>D</td><td>Electrolysis</td><td>$Cu^{2+} + 2e^- \rightarrow Cu$ and $2Cl^- \rightarrow Cl_2 + 2e^-$</td></tr><tr><td>E</td><td>Combustion</td><td>$2Mg + O_2 \rightarrow 2MgO$</td></tr><tr><td>F</td><td>Redox</td><td>$Fe + Cu^{2+} \rightarrow Fe^{2+} + Cu$</td></tr></table>
6b	C	
7a	A+E Both for 1 mark	Identify variable which is changing: particle size (lumps and powder) Other variables must be kept same: concentration (0.5mol/l) and Temp (20°C)
7b	E	<table><tr><td>Variable</td><td>Concentration</td><td>Temperature</td><td>Particle Size</td></tr><tr><td>Slowest</td><td>0.5mol/l</td><td>20°C</td><td>lump</td></tr><tr><td>Fastest</td><td>2.0mol/l</td><td>30°C</td><td>powder</td></tr></table>
8	A,D 1 mark each	☑A sulphur contains covalent bonding and is a non-conductor ☒B sucrose ($C_{12}H_{22}O_{11}$) contains covalent bonding and is a non-conductor ☑C copper chloride solution contains ionic bonding and is a conductor

		☑D solid silver contains metallic bonding and is a conductor

Question	Answer	Chemistry Covered
9a	thermosetting	Thermoplastic: Will reshape/melt on heating Thermosetting: Do not reshape/melt on heating
9b	good conductor of heat	Metals are good at conducting heat energy. This is desirable in a cooking pot as it will respond quickly to quick changes in heat during cooking.
10a	compound containing carbon & hydrogen only	Hydrocarbons are compounds which contain carbon and hydrogen only. Hydrocarbons often come in families e.g. alkanes, alkenes and cycloalkanes
10b(i)	bar chart containing:	½mark vertical scale; ½mark correct labelling of bars; 1mark bars drawn correctly
10b(ii)	residue	Fraction: Refinery gas | Naphtha | Kerosene | Gas Oils | Residue Use: Camping gas | Petrol | Aircraft fuel | Diesel | Tar/bitumen
11a(i)	chemicals run out	Cells/batteries are portable but run out when the chemicals in the battery are used up
11a(ii)	contains potassium hydroxide	Batteries contain electrolyte to complete the circuit. In this battery, the electrolyte used is potassium hydroxide paste, which is alkaline.
11a(iii)	ions cannot move when dry	Ions cannot move in the solid state but can move when in solution or molten
11b	sulphuric acid	A car battery contains lead plates and fairly concentrated sulphuric acid. The car battery can be charged up as the car is being used.
11c	portable	Batteries are portable and can be used anywhere. Mains electricity is limited to where power is supplied to.
12a	T R S most reactive ↔ least reactive	T is the most reactive as it gives of the biggest volume of gas. S is the least reactive as it did not react with acid at all
12b	one from:	temperature | mass of metal | metal particle size
12c	potassium floats or catches fire	Potassium floats on water and catches fire.
12d	burns with a pop	Gas: Hydrogen | Oxygen | Carbon Dioxide Test: burns with a pop | relights a glowing splint | turns lime water milky
13a	$S + O_2 \rightarrow SO_2$	S + O_2 → SO_2 sulphur is not a diatomic element; oxygen is a diatomic element; "DI" means straight to the formula
13b	covalent	Elements in Substance: Metals Only | Non-metals Only | Metals + non-metals Type of bonding: Metallic | Covalent | Ionic
13c	pH less than 7	Sulphur dioxide dissolves in water to form an acid. Acidic: pH<7 | Neutral: pH=7 | Alkaline: pH>7
14a	table showing:	**Type of Drink** / **% Alcohol** Beers: 7.5% Red wine: 12% Fortified Wines: 18% Whisky: 40%
14b(i)	enzymes	Enzymes are biological catalysts found in living organisms which catalyses all the different chemical reactions which take place in the organism.
14b(ii)	ethanol	

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<tr><td>16a</td><td>neutralisation</td><td>acid + metal oxide $\longrightarrow$ salt + water
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e.g. clover, pea family and bean family</td></tr>
<tr><td>17a(ii)</td><td>lightning</td><td>A spark is required to combine nitrogen and oxygen in air. The N≡N triple bond requires a large amount of energy to break before it can join with oxygen.</td></tr>
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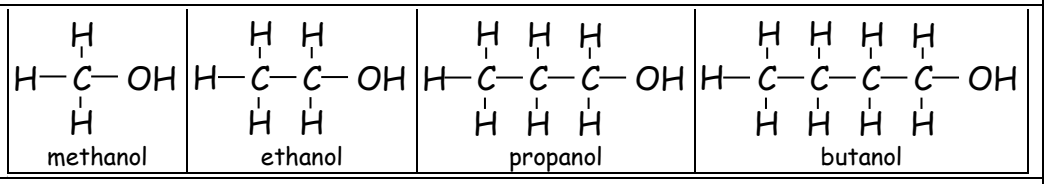
<tr><td>14b(ii)</td><td>ethanol</td><td> 
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