Past Papers Int 1 Chemistry

2009 Marking Scheme

Grade Awarded	Mark Required (/60)	Mark Required %	% candidates achieving grade
A	+40	67%	28.5%
B	+34	57%	25.9%
C	+28	47%	22.4%
D	+25	42%	7.6%
No award	<25	<42%	15.6%

Section:	Multiple Choice	Extended Answer
Average Mark:	12.5 /20	21.9 /40

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MC Qu	Answer	% Pupils Correct	Reasoning
1	D	73	☒A Lithium (group 1) and carbon (group 4) have different chemical properties ☒B Carbon (group 4) and phosphorus (group 5) have different chemical properties ☒C Bromine (group 7) and krypton (group 0) have different chemical properties ☑D Lithium and rubidium are both in group 1 and have the same chemical properties
2	A	41	☑A air is mixture of gases (approx 20% oxygen and approx 80% nitrogen) ☒B nitrogen is a element and is a pure substance ☒C carbon dioxide is a compound and is a pure substance ☒D hydrogen chloride is a compound and is a pure substance
3	C	74	☒A calcium chloride contains the elements: calcium and chlorine ☒B lithium sulphide contains the elements: lithium and sulphur ☑C potassium nitrate contains the elements: potassium, nitrogen and oxygen ☒D sodium chloride contains the elements: sodium and chlorine
4	B	64	☒A bonds inside molecules are strong ☑B strong bonds inside the molecule where atoms join together with bonds ☒C atoms join together to form molecules not ions ☒D atoms join together to form molecules not ions
5	A	39	☑A element: substance which contains only one type of atom ☒B compound: substance with 2 or more elements joined together by bonds ☒C compound: substance with 2 or more elements joined together by bonds ☒D ions: positively and negatively charge particles arranged in a lattice
6	C	49	☒A NO is the formula for nitrogen monoxide ☒B NO_2 is the formula for nitrogen dioxide ☑C N_2O is the formula for dinitrogen oxide ☒D N_2O_4 is the formula for dinitrogen tetroxide
7	A	92	☑A corrosion: the reaction of metals to form ions e.g. rusting of iron ☒B combustion: burning a substance and joining up with oxygen ☒C fermentation: the reaction in yeast where glucose → ethanol + carbon dioxide ☒D neutralisation: the reaction of acids to form water
8	C	60	Detergents remove grease/oil stains because they are soluble in both oil and water
9	B	78	☒A Cotton is a natural material from the cotton plant ☑B Nylon is a synthetic material by the chemical industry ☒C Silk is a natural material taken from the silk worm ☒D Wool is a natural material taken from sheep
10	D	69	☒A Coal is a non-renewable fossil fuel ☒B Petrol is made from crude oil, a non-renewable fossil fuel ☒C Diesel is made from crude oil, a non-renewable fossil fuel ☑D Ethanol is a renewable fuel made from the fermentation of sugar
11	A	93	☑A Kevlar is a very strong plastic used in bullet-proof vests ☒B PVC is a softer plastic used in drain pipes, etc ☒C Formica is a plastic used in table and worktop surfaces ☒D Perspex is a transparent plastic used in spectacle lenses
12	B	53	☒A polythene is non-biodegradable and is not broken down by bacteria ☒B polythene is thermoplastic as it reshapes when heated ☒C polythene is non-biodegradable and is not broken down by bacteria ☑D polythene is non-biodegradable and thermoplastic

13	B	47	☒A Bakelite is a polymer used is sockets and plug casings ☑B Ethene is a monomer which joins together to make the polymer poly(ethene) ☒C Nylon is a strong polymer used in ropes, clothing and tooth brush bristles ☒D Perspex is a transparent polymer used in spectacle lenses
14	D	84	☒A combustion: burning a substance and joining up with oxygen ☒B respiration: glucose + oxygen → carbon dioxide + water ☒C fermentation: the reaction in yeast where glucose → ethanol + carbon dioxide ☑D photosynthesis: carbon dioxide + water → glucose + oxygen
15	A	86	Carbon Dioxide is a greenhouse gas which contributes to the Greenhouse Effect where additional heat from the sun is absorbed by the atmosphere and the planet gets warmer.
16	C	47	☒A Cannot be used as a fertiliser as it does not contain potassium, nitrogen or phosphorus ☒B Cannot be used as a fertiliser as it does not contain potassium, nitrogen or phosphorus ☑C Fertilisers are soluble compounds containing potassium, nitrogen or phosphorus ☒D Cannot be used as a fertiliser as it is insoluble
17	B	39	<table><tr><td>Carbohydrate</td><td>glucose</td><td>fructose</td><td>maltose</td><td>sucrose</td><td>starch</td></tr><tr><td>Reaction with Benedict's Sol</td><td>Blue→Brick Red</td><td>Blue→Brick Red</td><td>Blue→Brick Red</td><td>No reaction</td><td>No reaction</td></tr></table>
18	C	64	☒A Carbohydrate provides the body with energy ☒B Fat provides the body with energy ☑C Fibre keeps the gut working well and prevents constipation ☒D Protein is needed by the body for body growth and tissue repair
19	A	27	☑A 1 bottle of alcopop contains 2 units of alcohol ☒B 1 measure of spirits e.g. whisky contain 1 unit of alcohol ☒C 1 glass of wine contains 1 unit of alcohol ☒D ½ pint of beer contains 1 unit of alcohol
20	D	73	☒A alcohol is legal drug which has no effect on micro-organisms ☒B a drug is a chemical which changes the way the body works ☒C a medicine is a chemical which helps the body get better ☑D antibiotics fight micro-organisms and help the body get better

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Long Qu	Answer	Reasoning
1a	O_3	Formula of ozone has 3 oxygen atoms per molecule
1b	Poisonous or toxic / Harmful or irritant	<table><tr><td></td><td>Hazard</td><td>Harmful/Irritant</td><td>Poisonous</td><td>Corrosive</td><td>Flammable</td></tr><tr><td>Symbol</td><td>  </td><td>  </td><td>  </td><td>  </td></tr></table>
1c	Sunscreen 3	Sunscreen 3 absorbs the most UVB radiation. The more UVB absorbed, the less is allowed to damage the skin underneath.
2a	Mass of Salt (grams)	Information found from x-axis of line graph
2b	1°C	Temperature at 60g of salt = 101°C Temperature at 0g of salt = 100°C Difference in temperature =101°C – 100°C = 1°C
2c	saturated	Solute: The solid which is dissolved Solvent: The liquid that does the dissolving Solution: The mixture of solute dissolved in solvent Saturated: When no more solute can be dissolved in the solvent
3a	Wine + lemonade	<table><tr><td>Solution</td><td>Acid</td><td>Neutral</td><td>Alkali</td></tr><tr><td>pH</td><td>pH<7</td><td>pH=7</td><td>pH>7</td></tr></table>
3b	Black Coffee	
3c(i)	Solid on bottom of test tube	When a solid in insoluble in water it will collect on the bottom of the container when the mixture settles
3c(ii)	Nitric acid	<table><tr><td>Acid</td><td>hydrochloric acid</td><td>sulphuric acid</td><td>nitric acid</td></tr><tr><td>Salt Ends in</td><td>chloride</td><td>sulphate</td><td>nitrate</td></tr></table>
4a	hydrochloric acid + sodium carbonate → Sodium chloride + Water + Carbon dioxide	acid + metal carbonate → salt + water + carbon dioxide hydrochloric acid + sodium carbonate → sodium chloride + water + carbon dioxide
4b(i)	Oxygen	Carbon dioxide prevents more oxygen getting to the fire to continue burning
4b(ii)	Combustion	Combustion is the scientific name for burning
5a	Distillation	Distillation separated chemicals with different boiling points
5b	Carbon + Hydrogen	Hydrocarbons are compounds that contain only the elements carbon and hydrogen
5c	Higher Smaller	<table><tr><td>Property</td><td>Petroleum Gas</td><td>Gasoline</td><td>Kerosene</td><td>Diesel</td><td>Residue</td></tr><tr><td>Viscosity</td><td colspan="4">Low ⟷ High</td><td></td></tr><tr><td>Evaporation</td><td colspan="4">Quickly ⟷ Slowly</td><td></td></tr><tr><td>Flammability</td><td colspan="4">High ⟷ Low</td><td></td></tr><tr><td>Boiling Point</td><td colspan="4">Low ⟷ High</td><td></td></tr><tr><td>Molecule Size</td><td colspan="4">Small ⟷ Large</td><td></td></tr></table>
5d	35%	Total = 2% + 22% + 17% + 24% = 65% Residue = 100% - 65% = 35%
6a	Alloy	Alloys are mixture of metals or mixtures of metals with non-metals
6b(i)	Increasing tin decreases the melting point	As the percentage of tin increases from 40% to 67%, the melting point decreases from 260°C to 190°C.

<table>
<tr><td>6b(ii)</td><td>Temperature between 190°C – 227°C</td><td>The melting point of 55% tin will be between the melting points for 50% (227°C) and 67% tin (190°C)</td></tr>
<tr><td>6c</td><td>Lead is poisonous</td><td>Lead entering your body can cause lead poisoning</td></tr>
<tr><td>7a</td><td>Relights a glowing splint</td><td><table><tr><td>Gas</td><td>Hydrogen</td><td>Oxygen</td><td>Carbon Dioxide</td></tr><tr><td>Gas Test</td><td>Burns with a pop</td><td>Relights glowing splint</td><td>Turns lime water milky</td></tr></table></td></tr>
<tr><td>7b(i)</td><td>Very bright glow</td><td>As magnesium is more reactive than zinc or copper, it would burn even brighter than zinc or copper.</td></tr>
<tr><td>7b(ii)</td><td>Mercury, silver or gold</td><td>The least reactive metals do not react with oxygen</td></tr>
<tr><td>8a</td><td>One Drop of Detergent measured using a dropper</td><td>PPA Technique Question</td></tr>
<tr><td>8b</td><td>To calculate average</td><td>PPA Technique Question</td></tr>
<tr><td>8c</td><td>Scum</td><td>Scum forms when soap is used in hard water</td></tr>
<tr><td>9a</td><td>Calcium</td><td>Calcium is the mineral needed for healthy teeth and bones</td></tr>
<tr><td>9b(i)</td><td>vitamin C vitamin A vitamin B2 vitamin D</td><td>Problem Solving: Information transfer from written passage to flow chart</td></tr>
<tr><td>9b(ii)</td><td>D and A</td><td>Problem Solving Question</td></tr>
<tr><td>10a</td><td>Temperature</td><td>The temperature is the only factor being varied between experiments</td></tr>
<tr><td>10b</td><td>Enzymes in yeast denatured at 60°C</td><td>The enzymes found in yeast which catalyse the reaction change shape and denature at 60°C</td></tr>
<tr><td>11a</td><td>Thermometer</td><td>The temperature the water in the test tube needs to be measured to compare the heat given off by the foods</td></tr>
<tr><td>11b</td><td>Distance between food and test tube</td><td>In a fair test, the distance between the test tube of water and the burning food must be equal.</td></tr>
<tr><td>12a(i)</td><td>Phosphorus</td><td><table><tr><td>Element</td><td>magnesium</td><td>phosphorus</td><td>iron</td><td>zinc</td><td>calcium</td></tr><tr><td>Atomic Number</td><td>12</td><td>15</td><td>26</td><td>30</td><td>20</td></tr><tr><td>Metal/Non-metal</td><td>Metal</td><td>Non-metal</td><td>Metal</td><td>Metal</td><td>Metal</td></tr></table></td></tr>
<tr><td>12a(ii)</td><td>Bar chart including:</td><td>½ mark – x and y axis labels
½ mark – scale on y-axis correct
½ mark – points plotted
½ mark – bars drawn</td></tr>
<tr><td>12b</td><td>Blue</td><td>When proteins are heated with soda lime (strong alkali) ammonia gas is given off. Ammonia dissolves in the water on damp pH paper and forms an alkali. This alkali turns the pH paper blue.</td></tr>
<tr><td>12c</td><td>Rub chocolate with filter paper. Any greasy stain indicates presence of fat</td><td><table><tr><th>Chemical</th><th>Tested with</th><th>Positive Test</th></tr><tr><td>Starch</td><td>iodine solution</td><td>Turns blue/black</td></tr><tr><td>Glucose</td><td>warm Benedict's solution</td><td>Turns orange/brick red</td></tr><tr><td>Protein</td><td>soda lime + heat</td><td>Damp pH paper turns blue</td></tr><tr><td>Fat</td><td>filter paper</td><td>Greasy mark on paper</td></tr></table></td></tr>
<tr><td></td><td></td><td></td></tr>
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