



# JABchem



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# Past Papers Int 1 Chemistry

# 2003 Marking Scheme

Grade Awarded	Mark Required (/60)	
A	42+	70%
B	36+	60%
C	30+	50%
D	?	?
No award	?	?

# 2003 Int 1 Chemistry Marking Scheme

MC Qu	Answer	% Pupils Correct	Reasoning										
1	D	38	Elements in the same column of the periodic table have the same chemical properties										
2	D	56	<input checked="" type="checkbox"/> A chlorine is added to water to kill bacteria <input checked="" type="checkbox"/> B carbon dioxide is added to water to make it fizzy <input checked="" type="checkbox"/> C fluoride does not prevent lead poisoning <input checked="" type="checkbox"/> D fluoride strengthens teeth and helps prevent tooth decay.										
3	C	69	In a chemical reaction, a new substance is <i>always</i> formed. Four different ways to spot a chemical reaction are: gas given off, colour change, solid being formed and an energy/temperature change.										
4	D	64	Speed of Reaction: Catalysts speed up chemical reactions Mass of Catalysts left: 1g left as catalyst is not used up in reaction.										
5	B	61	<input checked="" type="checkbox"/> A Inside molecules are strong bonds, weak bonds are between the molecules <input checked="" type="checkbox"/> B Atoms inside molecules are held together by strong bonds <input checked="" type="checkbox"/> C No ions present in the molecule (ions are charged particles) <input checked="" type="checkbox"/> D No ions present in the molecule (ions are charged particles)										
6	A	52	Aluminium, and metals above it on p6 of the data book, need to be melted and then electricity passed through it (electrolysis) to obtain the metal from the ore. Iron, lead, tin, copper, silver and gold ores will release the metal by heating with carbon.										
7	B	89	Nickel has a density of 8.9 (p3 of data book) <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Metal</th> <th style="text-align: center;">Density</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Tin</td> <td style="text-align: center;">7.31</td> </tr> <tr> <td style="text-align: center;">Silver</td> <td style="text-align: center;">10.5</td> </tr> <tr> <td style="text-align: center;">Aluminium</td> <td style="text-align: center;">2.7</td> </tr> <tr> <td style="text-align: center;">Magnesium</td> <td style="text-align: center;">1.74</td> </tr> </tbody> </table>	Metal	Density	Tin	7.31	Silver	10.5	Aluminium	2.7	Magnesium	1.74
Metal	Density												
Tin	7.31												
Silver	10.5												
Aluminium	2.7												
Magnesium	1.74												
8	C	68	2 - most reactive due to metal bursting into flames 3 - medium reactivity due to bright glow 1 - least reactive due to dull glow										
9	A	66	Silk is a natural fibre Nylon, Kevlar and polyester are synthetic fibres										
10	B	70	Oil floats on water and makes the burning oil jump up when water is added to burning oil.										
11	A	70	The larger the molecule size, the higher the boiling point. The smaller the molecule size, the lower the boiling point.										
12	A	32	<input checked="" type="checkbox"/> A Soot (carbon) is formed by incomplete combustion of fuels like diesel <input checked="" type="checkbox"/> B water is formed by complete combustion <input checked="" type="checkbox"/> C hydrogen is flammable and has not burned yet. <input checked="" type="checkbox"/> D carbon dioxide is formed by complete combustion										
13	B	61	thermoplastic: material which can be reshaped on heating non-biodegradable: materials that do not get broken down by bacteria										
14	D	81	The human body contains more than 60% water										
15	D	42	Sucrose is used as table sugar										

16	B	50	The Oily mark on the filter paper → fat present Iodine test staying yellow/brown → no starch present Benedict's Test turns brick-red → glucose present Heating with soda lime did not produce a Alkaline gas → no protein present B is the only answer with fat and glucose
17	C	74	Problem Solving Question: graph reading question
18	C	64	Proteins contain the elements: carbon, hydrogen, oxygen and nitrogen carbohydrates and fats contain the elements: carbon, hydrogen & oxygen
19	D	31	Proteins are made up of small amino acid building blocks joined together
20	A	50	Distillation is the process to make alcohol concentration increase. Glucose is broken down by fermentation into alcohol before fermentation

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Long Qu	Answer	Reasoning								
1a	coal or oil or natural gas/peat	Fossil fuels: coal, oil, natural gas, peat.								
1b(i)	distillation	Fraction distillation separates compounds with different boiling points								
1b(ii)	flammable									
2a	$C_3H_8O_5NP$	In a formula, the number 1 is not necessary								
2b	weeds use up the nutrients in soil	Weeds grow very fast and use up the essential elements (potassium, nitrogen and phosphorus) and this prevents crops from growing as well as they should.								
2c	Fungicide	Pesticides are used to control pests Fungicides are used to control bacteria and fungi and prevent disease in plants Herbicides are used to control weeds								
3a	match colour with colours on pH chart	Int1 PPA Practical Question								
3b	7	Neutral substances have a pH of 7								
3c	dissolve in water	Only soluble substances can be tested for pH as it must be dissolved in water.								
4a	Malachite	-IDE: contains two named elements -ATE: contains the two named element & oxygen.								
4b	6	Problem Solving Question: Reading information from a table & graph								
5a	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">copper</td> <td style="text-align: center;">voltmeter</td> </tr> <tr> <td style="text-align: center;">paste</td> <td style="text-align: center;">tin case</td> </tr> </table>	copper	voltmeter	paste	tin case	Problem Solving Question: Information from a passage to complete a diagram				
copper	voltmeter									
paste	tin case									
5b(i)	To complete the circuit	All circuits need to be complete. Salt solution contains ions which complete this simple battery circuit.								
5b(ii)	Add Iodine ( $\frac{1}{2}$ ) turns blue/black( $\frac{1}{2}$ )	Iodine solution turns blue/black colour in the presence of starch								
6a	Polymerisation	Polymerisation: process where small monomer molecules join up and form a larger polymer molecule e.g. ethene $\rightarrow$ poly(ethene)								
6b	Answer containing:	hot & cold water into two different beakers ( $\frac{1}{2}$ ) same volume of water in each beaker ( $\frac{1}{2}$ ) add detergent capsules to each beaker ( $\frac{1}{2}$ ) time how long plastic takes to dissolve or detergent takes to appear in each beaker ( $\frac{1}{2}$ )								
7a	prevents oxygen/water touching metal	Complete layer of metal onto of iron can prevent rusting as the outer layer of metal prevents oxygen and water getting to the iron underneath.								
7b	galvanising	Zinc is more reactive than iron and protects the iron it is attached to and prevents the iron from rusting								
7c(i)	rust indicator	Rust indicator turns blue in the presence of rust								
7c(ii)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Metal</td> <td style="text-align: center;">Iron Rusts?</td> </tr> <tr> <td style="text-align: center;">copper</td> <td style="text-align: center;">yes</td> </tr> <tr> <td style="text-align: center;">tin</td> <td style="text-align: center;">yes</td> </tr> <tr> <td style="text-align: center;">zinc</td> <td style="text-align: center;">no</td> </tr> </table>	Metal	Iron Rusts?	copper	yes	tin	yes	zinc	no	Zinc is higher in reactivity than iron (p6 of data booklet). Higher up metals protect lower down metals. Tin and copper are lower in reactivity than iron (p6 of data booklet). Lower down metals do not protect higher up metals.
Metal	Iron Rusts?									
copper	yes									
tin	yes									
zinc	no									

8a	drug	A drug is a substance which alters the natural state of the body.
8b(i)	Bar chart showing:	$\frac{1}{2}$ mark - x and y axis labels $\frac{1}{2}$ mark - scale on y-axis correct $\frac{1}{2}$ mark - points plotted $\frac{1}{2}$ mark - bars drawn
8b(ii)	200	50g chocolate = 80 mg caffeine → 100g of chocolate = 160mg caffeine 1 can of cola = 40mg caffeine total caffeine = 200mg caffeine
9a(i)	carbon dioxide + water ↓ glucose + oxygen	carbon dioxide + water → glucose + oxygen
9a(ii)	chlorophyll	chlorophyll is the green chemical in all plants which absorbs light energy for the process of photosynthesis.
9b(i)	more use of fossil fuels or cutting down of forests	Fossil fuels contain hydrocarbons which produce carbon dioxide when burned. Plants remove carbon dioxide from atmosphere by photosynthesis
9b(ii)	390 - 420	Problem Solving Question: Estimation of value on line graph.
10a	to put metals in order of reactivity	Int1 PPA Practical Question
10b	Any answer from:	size of pieces of metals mass of metal temperature of acid concentration of acid
10c	magnesium chloride	General Equation: acid + metal → salt + hydrogen Reaction: hydrochloric acid + magnesium → magnesium chloride + hydrogen
11a	Any answer from:	To improve appearance/colour of food To improve keeping/preserving qualities of food To improve nutritional value of food To improve flavour of food
11b	2.5	Animal feed uses 5% of phosphoric acid per year 5% of 50 million tonnes = $\frac{5}{100} \times 50$ million tonnes = 2.5 million tonnes
11c	helps to make oil & grease dissolve/mix in water	Detergent is soluble in water and in oil/grease. Detergent breaks up oil/grease into droplets that can dissolve in water.
11d	phosphorus	The three essential elements are phosphorus, potassium and nitrogen
12a	SO <sub>2</sub>	Sulphur <u>d</u> ioxide → 1 sulphur atom (S) and <u>2</u> oxygen atoms (O)
12b	approx 20%	Air is a mixture of nitrogen (approx 80%) and oxygen (approx 20%)
12c	acid rain	SO <sub>2</sub> dissolves in rain water to form acid rain.