Unit Code: J258 03
Qual Name: GCSE Chemistry B (Twenty First Century Science)
Qual Title: Chemistry Higher
Tier: Higher

Question Set	Q. No	Total Marks	AO	Spec Ref.	Topic	**Question Subject**, If required	Additional Notes/Comments	Maths Skills	Practical Assessment Skills
1	1a	2	2	6.2.10,11,12	How do chemists control the rate of reactions?	Rate of reaction	Overlap question. Maths	Y	
1	1b	2	3	6.2.1	How do chemists control the rate of reactions?	Rate of reaction	Overlap question. Practical skills		Y
1	1c	2	2	6.2.2	How do chemists control the rate of reactions?	Rate of reaction	Overlap question. Practical skills		
1	1d	3	1 and 2	5.3.8, 6.1.1	How are the amounts of substances in reactions calculated?	Rate of reaction	Overlap question. Maths. Synoptic question.	Y	
2	1a	2	3	5.3.1,2	How are the amounts of substances in reactions calculated?	Conservation of mass	Overlap		
2	1b	4	1 and 2	6.4.6	How are chemicals made on an industrial scale?	Atom economy	Overlap. Maths	Y	
2	1ci	1	2	5.3.11	How are the amounts of substances in reactions calculated?	Yield calculations	Overlap. Maths		
2	1cii	1	2	5.3.12	How are the amounts of substances in reactions calculated?	Yield calculations	Overlap. Maths	Y	
2	1d	2	1	2.3.8	How do metals and non-metals combine to form compounds?	Ionic bonding	Overlap		
3	1a	3	3	4.1.1, 4.1.2	How is data used to choose a material for a particular use?	Polymer properties.	Ideas about Science.		
3	1b	2	3	4.2.2	What are the different types of polymers?	Polymer intermolecular forces			
3	1c	1	2	4.3.1	How do bonding and structure affect properties of materials?	Addition polymers			
4	1ai	2	3	1.1.5, 1.3.5	How has the Earth’s atmosphere changed over time, and why?	Evolution of the Earth's atmosphere.	Maths.		
4	1aii	1	3	1.3.5	What is the evidence for climate change, why is it occurring?	Evolution of the Earth's atmosphere.	Maths.	Y	
4	1aiii	2	1	1.1.6	How has the Earth’s atmosphere changed over time, and why?	Evolution of the Earth's atmosphere.			
4	1b	1	1	3.2.3, 1.1.11	How has the Earth’s atmosphere changed over time, and why?	Equations	Synoptic Question	Y	

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5	1a	3	1	2.2.6, 2.2.8, 3.2.3	What does the Periodic Table tell us about the elements?	Halogens and ionic equations	Synoptic question. Practical skills.		Y
5	1b	1	2	2.2.6, 2.2.7	What does the Periodic Table tell us about the elements?	Properties of the halogens			
6	1a	1	1	4.4.2	Why are nanoparticles so useful?	Nanoparticles			
6	1b	3	1 and 3	4.4.5a, 4.4.5c	Why are nanoparticles so useful?	Nanoparticles	Ideas about science.		
6	1c	1	1	4.4.5	Why are nanoparticles so useful?	Nanoparticles			
6	1d	3	1 and 2	5.3.4, 5.3.9, 4.4.7	Why are nanoparticles so useful?	Nanoparticles	Synoptic question. Maths	Y	
7	1ai	1	1	6.3.1a	What factors affect the yield of chemical reactions?	Reversible reactions and equilibrium			
7	1aii	2	1	6.3.2	What factors affect the yield of chemical reactions?	Reversible reactions and equilibrium			
7	1bi	1	1	6.4.1	How are chemicals made on an industrial scale?	Nitrogen compounds			
7	1bii	2	1	6.3.3	What factors affect the yield of chemical reactions?	Reversible reactions and equilibrium			
7	1c	3	2	6.4.8	How are chemicals made on an industrial scale?	Reversible reactions and equilibrium	Ideas about Science		
8	1ai	2	1	3.2.4, 2.4.3, 3.2.3, 1.1.11	How are equations used to represent chemical reactions?	Writing equations	Synoptic question		
8	1aii	2	2	4.5.2 3.2.4	How are metals with different reactivities extracted?	Metal reactivity and extraction	Synoptic question		
8	1b	3	1	3.1.1	How are the atoms held together in a metal?	Metal properties and structure.			
9	1a	1	1	5.2.2	How do chemists find the composition of unknown samples?	Flame tests	Practical skills		Y
9	1bi	2	1	5.2.5	How do chemists find the composition of unknown samples?	Emission spectra	Practical skills		
9	1bii	1	1	5.2.5	How do chemists find the composition of unknown samples?	Emission spectra	Practical skills		
9	1ci	1	1	5.2.4b	How do chemists find the composition of unknown samples?	Tests for ions	Practical skills		Y
9	1cii	2	1	2.4.3, 6.1.3, 1.1.10, 1.1.11	How are equations used to represent chemical reactions?	Tests for ions / writing equations	Synoptic question		

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10	1a	1	1	3.3.1, 3.3.3	What are electrolytes and what happens during electrolysis?	Electrolysis			
10	1b	3	2	1.2.5, 1.2.6, 5.3.8	Why are there temperatures changes in chemical reactions?	Bond energy calculation	Maths		
10	1c	3	1 and 2	1.2.2	How has the Earth's atmosphere changed over time, and why?	Energy level diagrams			
11	1a	2	1	3.3.1, 3.3.4	What are electrolytes and what happens during electrolysis?	Electrolysis / half equations			
11	1b	3	1	2.3.9	How do metals and non-metals combine to form compounds?	Conductivity of ionic compounds			
11	1c	4	2	5.3.5, 5.3.8, 5.3.11, 5.3.14	How are the amounts of substances in reactions calculated?	Calculation of volume yield.	Maths	Y	
12	1a	1	1	6.1.5	What useful products can be made from acids?	Strong and weak acids			
12	1bi	1	1	5.4.7	How are the amounts of chemicals in solution measured?	Titration procedures	Practical skills		Y
12	1bii	3	1 and 2	5.4.3	How are the amounts of chemicals in solution measured?	Volume titration calculation	Practical skills. Maths	Y	Y
12	1biii	3	2	5.4.3, 5.4.9	How are the amounts of chemicals in solution measured?	Volume titration calculation	Practical skills. Maths	Y	Y
13	1ai	1	1	4.3.6	How do bonding and structure affect properties of materials?	Diamond and graphite	Overlap		
13	aii	2	2	4.3.6	How do bonding and structure affect properties of materials?	Diamond and graphite	Overlap		
13	b	2	2	5.3.8	How are the amounts of substances in reactions calculated?	Density calculations	Overlap	Y	
13	ci	2	2	5.3.8, 5.3.11	How are the amounts of substances in reactions calculated?	Mass calculations	Overlap. Maths.	Y	
13	cii	2	3	4.3.6	How do bonding and structure affect properties of materials?	Mass calculations	Overlap		
14	1ai	1	1	5.1.6b	How are chemicals separated and tested for purity?	Chromatography	Overlap		Y
14	1aii	1	2	5.1.4, 5.1.6	How are chemicals separated and tested for purity?	Chromatography	Overlap. Practical skills.		Y
14	1bi	1	1	5.1.4, 5.1.6	How are chemicals separated and tested for purity?	Chromatography	Overlap Practical skills.		Y
14	1bii	2	3	5.1.6	How are chemicals separated and tested for purity?	Chromatography	Overlap Practical skills.		Y

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14	1biii	2	1 and 2	5.1.5	How are chemicals separated and tested for purity?	Chromatography	Overlap Practical skills.		Y
14	1c	1	3	5.1.2	How are chemicals separated and tested for purity?	Chromatography	Overlap Practical skills.		
14	1d	1	2	5.1.3	How are chemicals separated and tested for purity?	Purity	Overlap Practical skills.		Y
15	1ai	1	1	3.4.10	Why is crude oil important as a source of new materials?	Dot and cross diagrams			
15	1aii	2	1	3.4.12	Why is crude oil important as a source of new materials?	Formuilae and models			
15	1b	3	1 and 2	5.3.3, 5.3.8	How are the amounts of substances in reactions calculated?	Percentage mass calculation	Maths	Y	
15	1c	2	2	3.4.5,3.4.14	How are the amounts of substances in reactions calculated?	Intermolecular forces.			
16	1a	2	2	4.5.5	What happens to products at the end of their useful life?	Life Cycle Assessments	Includes a data based calculation. Ideas about science	Y	
16	1b	2	1	4.5.4	What happens to products at the end of their useful life?	Life Cycle Assessments	Ideas about science		
17	1a	2	1	2.2.2,2.2.3	How have our ideas about atoms developed over time?	History of the Periodic Table	Ideas about science		
17	1b	1	1	2.2.3	How have our ideas about atoms developed over time?	History of the Periodic Table	Ideas about science		
17	1c	3	1	2.3.8	How do metals and non-metals combine to form compounds?	Dot and cross diagrams			
18	1a	2	1	1.2.9	Why are there temperatures changes in chemical reactions?	Hydrogen fuel cells			
18	1b	3	1 and 2	1.2.2	Why are there temperatures changes in chemical reactions?	Energy level diagrams			
18	1c	2	2	5.3.5,8	How are the amounts of substances in reactions calculated?	Moles calculation	Maths skills	Y	
19	1a	1	1	2.1.1	How have our ideas about atoms developed over time?	History of the development of atomic theory	Ideas about Science		
19	1b	1	2	2.1.1, 2.1.2	How have our ideas about atoms developed over time?	History of the development of atomic theory	Ideas about Science		
19	1c	2	1 and 2	2.1.4,6	How have our ideas about atoms developed over time?	Scale and standard form calculation	Maths skills	Y	
20	1a	1	3	6.2.1, 6.2.2	How do chemists control the rate of reactions?	Rates of reaction	Practical skills		Y
20	1b	2	2	6.2.4	How do chemists control the rate of reactions?	Catalyst	Practical skills		Y
20	1ci	2	2	5.3.14	How are the amounts of substances in reactions calculated?	Mass/volume calculation	Maths skills	Y	

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20	1cii	2	1	6.3.3	How do chemists control the rate of reactions?	Catalyst	Practical skills		
21	1a	2	1	1.4.2, 2.2.6	What does the Periodic Table tell us about the elements?	Properties of chlorine	Synoptic. Practical Skills		
21	1bi	2	1	1.4.1	How can scientists help improve the supply of potable water?	Properties of chlorine			
21	1bii	1	1	1.4.1	How can scientists help improve the supply of potable water?	Risk and benefit	Ideas about science		
21	1ci	1	2	2.2.6, 3.2.3	What does the Periodic Table tell us about the elements?	Reactions of the halogens	Synoptic. Practical Skills		
21	1cii	2	1	2.2.6, 3.2.3	What does the Periodic Table tell us about the elements?	Reactions of the halogens / ionic equation	Synoptic		
22	1a	2	1	6.3.1,2	What factors affect the yield of chemical reactions?	Equilibrium / Conditions for the Haber process			
22	1b	2	1	6.4.3	How are chemicals made on an industrial scale?	Equilibrium / Conditions for the Haber process			
22	1c	3	3	6.4.4	How are chemicals made on an industrial scale?	Equilibrium / Conditions for the Haber process	Ideas about Science		
22	1d	2	3	6.4.2	How are chemicals made on an industrial scale?	Use of fertilisers	Ideas about Science		
23	1ai	1	2	3.2.2	How are metals with different reactivities extracted?	Metal reactivity			Y
23	1aii	1	1	3.2.3, 3.3.4, 3.3.5	How are metals with different reactivities extracted?	Half equations			
23	1aiii	1	2	3.2.3, 3.3.4, 3.3.6	How are metals with different reactivities extracted?	Redox			
23	1b	2	1	3.2.3,2.4 .4	How are metals with different reactivities extracted?	Equation for displacement	Synoptic		
23	1c	2	1	4.3.1,3.1 .1	How are the atoms held together in a metal?	Metallic bonding	Synoptic		
24	1ai	1	2	6.1.1, 6.2.11	How do chemists control the rate of reactions?	Rate of reaction	Maths skills		Y
24	1aii	2	1 and 2	6.2.11, 6.2.12	How do chemists control the rate of reactions?	Rate of reaction	Maths skills	Y	Y
24	1aiii	1	3	6.2.11, 6.2.8	How do chemists control the rate of reactions?	Rate of reaction	Maths skills		Y
24	1aiv	2	1 and 3	6.2.8	How do chemists control the rate of reactions?	Rate of reaction	Maths skills	Y	Y
24	1bi	2	2	5.3.5	How are the amounts of substances in reactions calculated?	Mass calculation	Maths skills	Y	

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24	1bii	2	2	5.3.7	How are the amounts of substances in reactions calculated?	Mass calculation	Maths skills	Y	
24	1ci	1	3	5.4.7	How are the amounts of chemicals in solution measured?	Titration	Practical skills		Y
24	1cii	1	3	5.4.8	How are the amounts of chemicals in solution measured?	Titration	Practical skills		Y
25	1(a)	1	1	5.4.4	How are the amounts of chemicals in solution measured?	Titrations	Overlap. Practical skills.		
25	1(b)(i)	2	1	5.4.7	How are the amounts of chemicals in solution measured?	Titrations	Overlap. Practical skills.		Y
25	1(b)(ii)	1	3	5.4.7	How are the amounts of chemicals in solution measured?	Titrations	Overlap. Practical skills.		Y
25	1(c)(i)	1	2	5.3.8, 5.4.7	How are the amounts of substances in reactions calculated?	Titrations	Overlap. Practical skills. Maths.		Y
25	1(c)(ii)	2	1 and 3	5.4.7, 5.3.8, 5.4.8	How are the amounts of chemicals in solution measured?	Titrations	Overlap. Practical skills. Maths.	Y	Y
25	1(c) (iii)	4	1 and 2	5.3.8	How are the amounts of substances in reactions calculated?	Titrations / calculation	Overlap. Practical skills. Maths.	Y	Y
26	1ai	1	3	6.2.7	How do chemists control the rate of reactions?	Rate of reaction	Overlap. Practical Skills		Y
26	1aii	2	1	6.2.3	How do chemists control the rate of reactions?	Rate of reaction	Overlap. Practical Skills		
26	1b	1	1	6.2.2	How do chemists control the rate of reactions?	Rate of reaction	Overlap. Practical Skills		
26	1ci	1	2	6.2.7 6.2.8	How do chemists control the rate of reactions?	Rate of reaction	Overlap. Practical Skills		Y
26	1cii	1	2	6.2.8	How do chemists control the rate of reactions?	Rate of reaction	Overlap. Practical Skills		Y
26	1ciii	1	2	6.2.8	How do chemists control the rate of reactions?	Rate of reaction	Overlap. Practical Skills		Y
27	1a	1	2	3.4.16	Why is crude oil important as a source of new materials?	Alkenes			
27	1b	1	2	5.3.4, 5.3.9	How are the amounts of substances in reactions calculated?	Alkenes / the mole	Maths	Y	
27	1ci	1	1	3.4.18	Why is crude oil important as a source of new materials?	Alkenes			
27	1cii	1	1	3.4.18	Why is crude oil important as a source of new materials?	Alkenes			
28	1ai	1	3	1.3.5	What is the evidence for climate change, why is it occurring?	Data processing/climate change	Maths, ideas about science		

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28	1aii	1	3	1.3.5	What is the evidence for climate change, why is it occurring?	Data processing/climate change	Maths, ideas about science	Y	
28	1bi	2	3	1.3.1	What is the evidence for climate change, why is it occurring?	Carbon dioxide/greenhouse effect	Ideas about science		
28	1bii	1	1	1.3.4	What is the evidence for climate change, why is it occurring?	Carbon dioxide/greenhouse effect	Ideas about science		
28	1c	1	1	1.3.3	What is the evidence for climate change, why is it occurring?	Carbon dioxide/greenhouse effect	Ideas about science		
29	1ai	3	1	5.2.3	How do chemists find the composition of unknown samples?	Flame tests	Practical skills		Y
29	1aii	1	1	5.2.2	How do chemists find the composition of unknown samples?	Flame tests	Practical skills		Y
29	1b	3	2	5.2.4, 1.1.10	How do chemists find the composition of unknown samples?	Equation / tests for ions	Synoptic	Y	Y
29	1ci	1	3	5.2.5	How do chemists find the composition of unknown samples?	Emission spectra			Y
29	1cii	1	1	5.2.6	How do chemists find the composition of unknown samples?	Emission spectra			Y
30	1a	2	3	4.5.1	What happens to products at the end of their useful life?	Corrosion of iron.	Practical skills		Y
30	1bi	1	3	3.3.5	What happens to products at the end of their useful life?	Corrosion of iron.			Y
30	1bii	1	1	3.3.5	What happens during oxidation reactions?	Oxidation / ionic equation			Y
30	1c	1	1	5.2.4a	How do chemists find the composition of unknown samples?	Ion tests	Practical skills		Y
31	1ai	1	2	3.4.6	What are the different types of polymers?	Molecular and empirical formulae		Y	
31	1aii	2	2	4.2.2	What are the different types of polymers?	Formula of a polymer			
31	1b	1	3	4.1.2	How is data used to choose a material for a particular use?	Polymer properties			
31	1c	3	1 and 2	4.2.3, 4.2.4	What are the different types of polymers?	Polymers			
32	1a	3	2	4.3.6	How do bonding and structure affect properties of materials?	Diamond and graphite			
32	1b	1	1	2.3.12, 2.3.5, 4.3.8	How do metals and non-metals combine to form compounds?	Ionic Compounds			
32	1c	3	1	2.3.5, 2.3.9, 4.3.6, 4.3.8	How do bonding and structure affect properties of materials?	Properties related to structure			

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33	1a	1	1	6.3.2	What factors affect the yield of chemical reactions?	Equilibrium			
33	1bi	1	2	6.4.3	How are chemicals made on an industrial scale?	Conditions for the Haber Process	Maths	Y	
33	1bii	1	2	6.4.4	How are chemicals made on an industrial scale?	Conditions for the Haber Process			
33	1biii	3	2	5.3.5,7	3 How are the amounts of substances in reactions calculated?	Mass calculation	Maths	Y	
33	1c	2	1	6.1.2	What useful products can be made from acids?	Preparation of salts	Practical Skills		Y
33	1d	1	2	5.1.1	How are chemicals separated and tested for purity?	Fertilisers			
34	1a	3	1 and 2	5.3.5	How are the amounts of substances in reactions calculated?	Mass calculation	Maths	Y	
34	1b	2	1	1.1.11, 2.2.5	What does the Periodic Table tell us about the elements?	Group 1 reaction with water/equation	Synoptic	Y	
34	1c	2	1	3.3.2	What are electrolytes and what happens during electrolysis?	Electrolysis			Y
34	1di	2	1 and 2	2.2.8	What does the Periodic Table tell us about the elements?	Group 7 displacement reactions	Practical skills		Y
34	1dii	2	2	2.2.6	What does the Periodic Table tell us about the elements?	Safety precautions	Practical skills		Y
35	1a	2	1	3.1.1,2	How are the atoms held together in a metal?	Structure of metals			
35	1b	2	1	2.5.1, 2.2.4	What are the properties of transition metals?	Transition metals.	Synoptic.		
35	1ci	1	1	6.4.5	How are chemicals made on an industrial scale?	Atom economy			
35	1cii	3	1 and 2	6.4.6,7	How are chemicals made on an industrial scale?	Atom economy	Maths	Y	
35	1ciii	1	2	6.4.6, 6.4.7	How are chemicals made on an industrial scale?	Atom economy			
35	1civ	3	3	6.4.8	How are chemicals made on an industrial scale?	Atom economy	Ideas about Science		
35	1d	2	1	2.3.8	How do metals and non-metals combine to form compounds?	Dot and cross diagrams			