Unit Code: J258 04
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	3	1 and 2	6.1.4	What useful products can be made from acids?	Properties of alkenes and carboxylic acids	Overlap Question. Practical skills		Y
1	1bi	2	2	6.1.4	What useful products can be made from acids?	Hazards and risk	Overlap Question. Practical skills		Y
1	1bii	1	2	6.1.4	What useful products can be made from acids?	Hazards and risk	Overlap Question. Practical skills		Y
1	1biii	3	3	3.4.18	Why is crude oil important as a source of new materials?	Hazards and risk	Overlap Question. Practical skills		Y
2	1a	1	2	2.2.2	What does the Periodic Table tell us about the elements?	Development of the Periodic Table	Overlap question. Ideas about science.		
2	1b	1	2	2.2.2	What does the Periodic Table tell us about the elements?	Development of the Periodic Table	Overlap question. Ideas about science.		
2	1c	2	2	2.2.2, 2.5.1	What does the Periodic Table tell us about the elements?	Development of the Periodic Table	Overlap question. Ideas about science.		
2	1d	1	1	2.5.1	What are the properties of transition metals?	Development of the Periodic Table	Overlap question. Ideas about science.		
2	1ei	2	1	6.1.4	What useful products can be made from acids?	Testing pH	Overlap question. Practical skills		Y
2	1eii	2	3	6.1.4	What useful products can be made from acids?	Testing pH	Overlap question. Practical skills		Y
3	1ai	3	1	1.4.1, 5.1.7	How can scientists help improve the supply of potable water?	Drinking water	Synoptic. Practical skills. Ideas about Science		
3	1aii	2	1	1.4.1, 5.1.7	How can scientists help improve the supply of potable water?	Drinking water	Synoptic. Practical skills. Ideas about Science		
3	1aiii	1	1	1.4.1	How can scientists help improve the supply of potable water?	Drinking water	Practical skills. Ideas about Science		
4	1a	3	2	2.1.7, 2.2.1, 2.3.12	What does the Periodic Table tell us about the elements?	Atomic structure.			
4	1bi	2	1 and 2	2.1.7, 2.3.12,	How do metals and non-metals combine to form compounds?	Atoms and ions			
4	1bii	1	1	2.2.1, 2.3.4, 2.3.12	How do metals and non-metals combine to form compounds?	Periodic Table			

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5	1a	2	1	4.3.2, 4.3.5, 4.3.7, 4.3.8, 3.4.9	How do bonding and structure affect properties of materials?	Diamond and graphite			
5	1b	3	1	4.3.1, 4.3.5, 4.3.6, 4.3.8, 3.4.14	How do bonding and structure affect properties of materials?	Diamond and graphite			
5	1c	2	1	4.3.5, 4.3.7	How do bonding and structure affect properties of materials?	Diamond and graphite			
6	1a	2	2	3.4.16	Why is crude oil important as a source of new materials?	Alkanes and alkenes			
6	1bi	1	2	3.4.16	Why is crude oil important as a source of new materials?	Alkanes and alkenes / homologous series.			
6	1bii	2	2	3.4.16	Why is crude oil important as a source of new materials?	Alkanes and alkenes / homologous series.			
6	1c	1	2	3.4.4	Why is crude oil important as a source of new materials?	Alkanes and alkenes / homologous series/ formulae.	Maths	Y	
6	1di	3	2	3.4.18, 1.1.10	Why is crude oil important as a source of new materials?	Equations for combustion	Maths	Y	
6	1dii	1	2	3.4.18, 1.1.10	Why is crude oil important as a source of new materials?	Equations for combustion	Maths	Y	
7	1a*	6	3	5.2.5, 5.2.7	How do chemists find the composition of unknown samples?	Emission spectroscopy	Level of Response		Y
7	1b	2	2	5.4.1	How are the amounts of chemicals in solution measured?	Emission spectroscopy			Y
8	1a	3	1 and 2	5.3.5, 5.3.8, 5.3.10	How are the amounts of substances in reactions calculated?	Mass calculation	Maths. Practical Skills	Y	Y
8	1b	4	1 and 2	5.3.7, 5.3.8, 5.3.11	How are the amounts of substances in reactions calculated?	Mass calculation	Maths. Practical Skills	Y	Y
8	1ci	1	2	5.3.13	How are the amounts of substances in reactions calculated?	Yields	Practical Skills		Y
8	1cii	1	3	5.3.13	How are the amounts of substances in reactions calculated?	Yields	Practical Skills		Y
9	1a	3	2	6.2.8, 6.2.10,	How do chemists control the rate of reactions?	Rate of reaction graphs	Maths, practical skills	Y	Y
9	1aii	1	2	6.2.12	How do chemists control the rate of reactions?	Rate of reaction graphs	Maths, practical skills	Y	Y
9	1aiii	2	2 and 3	6.2.12	How do chemists control the rate of reactions?	Rate of reaction graphs	Maths, practical skills	Y	Y
9	1bi	2	1 and 2	6.2.8, 6.2.9, 6.2.10,	How do chemists control the rate of reactions?	Rate of reaction graphs	Maths, practical skills	Y	Y
9	1bii	2	2	6.2.9, 6.2.10,	How do chemists control the rate of reactions?	Rate of reaction graphs	Maths, practical skills	Y	Y

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10	1a*	6	3	4.5.4a, 4.5.4b,	What happens to products at the end of their useful life?	Life cycle assessment of polymers	Level of response. Maths. Ideas about science.		
10	1b	1	1	4.5.7	What happens to products at the end of their useful life?	Life cycle assessment of polymers	Ideas about science		
10	1c	1	1	4.5.4c	What happens to products at the end of their useful life?	Life cycle assessment of polymers	Ideas about science		
11	1a	2	1	1.1.7, 1.1.8, 6.4.2	How has the Earth's atmosphere changed over time, and why?	Air quality data processing			
11	1bi	3	3	1.1.8	How has the Earth's atmosphere changed over time, and why?	Air quality data processing	Maths, Ideas about science	Y	
11	1bii	1	2	1.1.8	How has the Earth's atmosphere changed over time, and why?	Air quality data processing	Maths	Y	
11	1c	2	1	1.1.7, 1.1.8	How has the Earth's atmosphere changed over time, and why?	Sampling strategies to monitor air quality.	Ideas about science.		
12	1a	3	2	5.2.2/3	How do chemists find the composition of unknown samples?	Use of flame tests to identify ions	Overlap question. Practical Skills		Y
12	1bi	1	2	5.2.4	How do chemists find the composition of unknown samples?	Use of ion tests to identify ions	Overlap question. Practical Skills		Y
12	1bii	3	3	5.2.4	How do chemists find the composition of unknown samples?	Use of ion tests to identify ions	Overlap question. Practical Skills		Y
12	1c	1	1	5.2.6	How do chemists find the composition of unknown samples?	Emission spectroscopy	Overlap question. Practical Skills		Y
13	1ai	3	2	4.4.6/8/9	Why are nanoparticles so useful?	Surface area calculations of nanoparticles	Overlap question. Maths		
13	1aii	2	1	4.4.6/8/9	Why are nanoparticles so useful?	Surface area of nanoparticles	Overlap question. Maths		
13	1bi	2	1 and 2	4.4.1/5	Why are nanoparticles so useful?	Risk and benefits of nanoparticles.	Overlap question. Ideas about Scienc		
13	1bii	3	3	4.4.1/5	Why are nanoparticles so useful?	Risk and benefits of nanoparticles.	Overlap question. Ideas about Science.		
14	1a	3	2	5.4.5/6, 6.1.4	How are the amounts of chemicals in solution measured?	Neutralisation of acids	Maths. Practical Skills.Synoptic	Y	Y
14	1b	2	2	5.4.5/6, 6.1.4, 5.4.9	How are the amounts of chemicals in solution measured?	Neutralisation of acids	Maths. Practical Skills.Synoptic	Y	Y
15	1a	1	1	4.2.3	What are the different types of polymers?	Polymerisation			
15	1bi	1	1	4.2.3 /3.4.17	What are the different types of polymers?	Polymerisation			
15	1bii	2	1	4.2.3/3.4.17	What are the different types of polymers?	Polymerisation			
15	1biii	2	1	4.2.3 /3.4.16	What are the different types of polymers?	Polymerisation			
15	1c	2	2	4.2.3 / 5.3.3	What are the different types of polymers?	Polymerisation	Maths	Y	
16	1a	2	2	3.2.3 / 1.1.10	How are metals with different reactivities extracted?	Equation.	Maths		Y

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16	1b	2	2	3.2.4/6.1.2	How are metals with different reactivities extracted?	Mineral extraction.			Y
16	1ci	3	1 and 2	3.2.4/5.3.11	How are the amounts of substances in reactions calculated?	Yield Calculations	Maths. Practical Skills	Y	Y
16	1cii	2	2	3.2.4/5.3.12	How are the amounts of substances in reactions calculated?	Yield Calculations	Maths. Practical Skills	Y	Y
16	1ciii	2	3	3.2.4/5.3.13	How are the amounts of substances in reactions calculated?	Yield Calculations	Maths. Practical Skills		Y
16	1d	3	3	3.2.6	How are metals with different reactivities extracted?	Mineral extraction and the environment	Ideas about Science		
17	1a	3	1 and 2	6.4.9 /1.2.1	How are chemicals made on an industrial scale?	Exothermic reactions	Ideas about Science		
17	1b	2	2	6.4.9 / 5.1.7/8	How are chemicals made on an industrial scale?	Industrial production. Flow Chart interpretation.	Ideas about Science. Practical skills.		Y
17	1c	3	1 and 2	6.4.9/6.4.6/7	How are chemicals made on an industrial scale?	Atom economy.	Maths	Y	
17	1di	1	1	6.4.8	How are chemicals made on an industrial scale?	Sustainability	Ideas about science.		
17	1dii	2	2	6.4.8/9/6	How are chemicals made on an industrial scale?	Sustainability	Ideas about science.		
17	1e	2	1	6.4.9/10	How are chemicals made on an industrial scale?	Batch and continuous processes	Ideas about science. Practical skills		
18	1*	6	1 and 3	1.1.1/2.3.11/ 12	How do metals and non-metals combine to form compounds?	Bonding and structure in sodium chloride.	Level of response. Ideas about Science.		
19	1*	6	1 and 3	2.2.6/7/8	What does the Periodic Table tell us about the elements?	Group 7 displacement reactions.	Level of response. Practical Skills		Y
20	1a	2	2	2.5.1 /4.1.1	What are the properties of transition metals?	Transition element properties.			
20	1b	3	1	2.5.1 / 4.1.1	What are the properties of transition metals?	Transition element properties.			
20	1c	2	1 and 2	2.5.1 / 4.1.1	What are the properties of transition metals?	Transition element properties.			
20	1d	2	1	2.5.1	What are the properties of transition metals?	Transition element properties / formulae.			
20	1e	1	1	2.5.1	What are the properties of transition metals?	Transition element properties.			
21	1ai	2	2	1.1.8 / 1.3.5	What is the evidence for climate change, why is it occurring?	Greenhouse gases	Maths.	Y	
21	1aii	2	3	1.1.8 / 1.3.6	What is the evidence for climate change, why is it occurring?	Greenhouse gases	Maths. Ideas about Science.		
21	1b	6	2 and 3	1.1.8	What is the evidence for climate change, why is it occurring?	Greenhouse gases	Maths. Ideas about Science.	Y	

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22	1a	2	2	4.5.6	What happens to products at the end of their useful life?	Recycling polymers	Overlap question. Ideas about science.		
22	1bi	1	2	4.5.6	What happens to products at the end of their useful life?	Drinking water	Overlap question. Ideas about science.		
22	1bii	1	1	1.4.1 4.5.6	What happens to products at the end of their useful life?	Drinking water	Overlap question. Ideas about science.		
22	1ci	1	2	4.5.6	What happens to products at the end of their useful life?	Life cycle assessments of polymers	Overlap question. Ideas about science.		
22	1cii	1	2	4.5.6	What happens to products at the end of their useful life?	Life cycle assessments of polymers	Overlap question. Ideas about science.		
22	1d	2	1 and 2	4.5.6	What happens to products at the end of their useful life?	Life cycle assessments of polymers	Overlap question. Ideas about science.		
22	1e	2	2	4.5.4	What happens to products at the end of their useful life?	Life cycle assessments of polymers	Overlap question. Ideas about science.		
23	1ai	3	2	3.3.7	What are electrolytes and what happens during electrolysis?	Products of electrolysis	Overlap question. Practical Skills		Y
23	1aii	2	1	1.4.2 1.1.12	How has the Earth's atmosphere changed over time, and why?	Gas tests	Overlap question. Practical Skills		
23	1aiii	2	2	3.3.7	What are electrolytes and what happens during electrolysis?	Products of electrolysis	Overlap question. Practical Skills		
23	1b	2	1 and 3	3.3.8	What are electrolytes and what happens during electrolysis?	Electrolysis experimental set-up	Overlap question. Practical Skills		Y
24	1a	2	1	3.4.1/2	Why is crude oil important as a source of new materials?	Crude oil.	Ideas about science.		
24	1b	3	1	3.4.3/5	Why is crude oil important as a source of new materials?	Crude oil/fractional distillation.			
24	1ci	2	2	3.4.4/3.4.17	Why is crude oil important as a source of new materials?	Alkanes/Homologous series.	Ideas about science.		
24	1cii	2	2	3.4.4/3.4.17	Why is crude oil important as a source of new materials?	Alkanes/Homologous series.	Ideas about science. Maths.	Y	
24	1ciii	2	1	4..3.2/3	How do bonding and structure affect properties of materials?	Carbon compounds and structure.			
25	1a	2	1 and 2	6.1.1/ 3.2.3	What useful products can be made from acids?	Equations	Synoptic. Practical Skills	Y	
25	1b	2	1 and 3	6.2.7	How do chemists control the rate of reactions?	Gas collection	Practical Skills.		Y
25	1ci	2	1	6.2.10/11/12 /13	How do chemists control the rate of reactions?	Rate of reaction graphs.	Practical Skills.Maths	Y	Y
25	1cii	2	2	6.2.10/11/12 /13 / 5.3.10	How do chemists control the rate of reactions?	Rate of reaction graphs.	Practical Skills.Maths	Y	Y
25	1di	2	2	6.2.10/11/12 /13	How do chemists control the rate of reactions?	Rate of reaction graphs.	Practical Skills.Maths	Y	Y

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25	1dii	2	3	6.2.10/11/12 /13 6.1.6	How do chemists control the rate of reactions?	Rate of reaction graphs.	Practical Skills.Maths	Y	Y
26	1a*	6	1 and 2	2.3.5/6/8	How do metals and non-metals combine to form compounds?	Ionic bonding.	Level of response. Synoptic		
26	1b	2	1	2.3.9 / 6.1.1 2.3.5	How do metals and non-metals combine to form compounds?	Ionic bonding.	Synoptic		
27	1a	1	3	5.3.1/2	How are the amounts of substances in reactions calculated?	Reaction of magnesium with oxygen.	Practical Skills		Y
27	1b	1	2	5.3.6	How are the amounts of substances in reactions calculated?	Reaction of magnesium with oxygen.	Practical Skills		Y
27	1c	3	2	5.3.1/2	How are the amounts of substances in reactions calculated?	Conservation of mass.	Practical Skills. Maths.		Y
27	1d	3	1, 2 and 3	5.3.1/2	How are the amounts of substances in reactions calculated?	Conservation of mass.	Practical Skills. Maths.		Y
27	1ei	2	2	5.3.4/5	How are the amounts of substances in reactions calculated?	Mass calculation	Practical Skills. Maths.	Y	Y
27	1eii	2	2	5.3.4/5/6	How are the amounts of substances in reactions calculated?	Mass calculation	Practical Skills. Maths.	Y	
28	1ai	2	3	2.3.5 / 2.4.1 / 3.4.6 /2.3.12 2.3.6	How do metals and non-metals combine to form compounds?	Models for ionic compounds.	Synoptic. Ideas about science.		
28	1aii	2	1	2.3.5 / 2.4.1 / 3.4.6 /2.3.12 2.3.6	How do metals and non-metals combine to form compounds?	Models for ionic compounds.	Synoptic. Ideas about science.		
28	1b*	6	1, 2 and 3	1.2.3/4	Why are there temperatures changes in chemical reactions?	Energy changes/energy level diagrams.	Level of response	Y	
28	1c	1	1	1.1.10	How are equations used to represent chemical reactions?	Formulae.			
29	1a	1	1	6.1.7	What useful products can be made from acids?	Neutral and Alkali solutions			Y
29	1b	1	1	6.1.6	What useful products can be made from acids?	pH and concentration of hydrogen ions		Y	Y
29	1c	1	3	6.1.6/7	What useful products can be made from acids?	Trend in relationship between concentation of hydrogen ions and pH		Y	Y
29	1d	3	3	6.1.6/7	What useful products can be made from acids?	Accuracy of readings			Y
29	1e	1	3	6.1.6/7	What useful products can be made from acids?	Contamination of solutions			Y
30	1a	3	1, 2 and 3	1.1.7 1.3.5	How has the Earth's atmosphere changed over time, and why?	Data Interpretation for weather and sulfur dioxide concentration		Y	

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30	1b	4	2 and 3	1.1.7 1.3.5	How has the Earth's atmosphere changed over time, and why?	Data Interpretation for weather and sulfur dioxide concentration		Y	
30	1c	3	3	1.1.7	How has the Earth's atmosphere changed over time, and why?	Describing the outline of a plan			Y