YEAR 9 SUMMER 2024 – PAPER 1 MARK SCHEME

Section 1 Matter: Atomic structure and the periodic table

Q1.a. Atomic weight [1]

b. Gaps/ Spaces [1]

c. 18 [1]

d. 22 [1]

Q2.a. Positively charged [1]

b. The mass is concentrated at the centre of the atom [1]

c. Fluorine [1]

d. 2.13g [1]

Q3.a. Alkali metals [1]

b. One mark for each of the following: ***Maximum 4 marks***
Suitable (even) scale starting at zero on the y axis [1]
X and Y axis labelled correctly (X = Group 1 element, Y = Melting point/ ^{o}C[1]
3 bars plotted correctly (within 1/2 mm) [1]
OR All bars plotted correctly [2]

c. Stage 1 → Melting [1]

Stage 2 → Freezing [1]

Total for this section: 15 marks

Section 2 Matter: Atomic structure and Radioactivity

Q4. a. A = Electron [1]

B = Atom [1]

C = Orbit [1]

D = Nucleus [1]

b. Positive charge provided by protons [1]

(Every atom of the same element contains the) same number of protons [1]

Q5. a. Contamination [1]

b. 19 Bq [1]

Accept 18 or 20

c. 5.5 years [1]

d. 5.5 years [1]

e. = (36 (billion) / 45 (billion)) x 100 [1]

80% [1]

f. Radioactivity is a random process [1]

g. Any one from: Use for a limited time/ maximise distance from source/ use tongs/ wear gloves/ wear lead lined pinny [1]

h. Peer review [1]

Total for this section: 15 marks

Section 3 Earth and beyond: Chemistry of the atmosphere

Q6. a. This is a level of response question [6]
When marking this question you must first give the students a level of response. Once this is decided a mark within that level is awarded. The indicative content is a list of possible answers that could be included is not a exhaustive list students may include other relevant Scientific knowledge. The indicative content should not be used as a list of marking points to award a mark out of 6.

Level 3: Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	5-6
Level 2: Relevant points (reasons/causes) are identified, and there are attempts at logically linking. The resulting account is not fully clear.	3-4
Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1-2
No relevant content	0

Indicative content:

Nitrogen increased – because volcanoes produced nitrogen

- Because bacteria produced nitrogen

- Because ammonia was converted to nitrogen

Oxygen increased – Because algae and plants produced oxygen

- By photosynthesis

Carbon dioxide decreased – Because algae and plants used carbon dioxide

- By photosynthesis

- Because oceans formed, and the carbon dioxide dissolved in the water

- Because carbon dioxide formed carbonates/ formed sedimentary rocks

- Because algae/ plants/ animals formed fossil fuels

Q7. a. Methane [1]

b. Any two from: - Ice caps melting

- Rise in sea levels

- Extreme weather *Ignore forest fires*

- Loss of habitats

- Food insecurity

Ignore global warming/ acid rain/ global dimming

c. D, B, C, A [1]

d. Use less plastic OR Use recycled plastic [1]

Ignore any reference to energy/ fuels

e. Carbon footprint [1]

f. Coal OR Gas [1]

g. = 17.2 / 4 [1]

4.3kg [1]

Total for this section: 15 marks

Section 4 Reactions: Energy changes

Q8. a. Thermometer [1]

b. Measuring cylinder [1]

c. 14°C [1]

d. Highest temperature reached [1]

e. Any two from: Volume of copper sulphate solution ($25cm^3$)

- Mass of metal (1g)

- How many times you stir

- Concentration of copper sulphate solution

e. Put a lid on the beaker OR Use a polystyrene/ insulating cup [1]

f. = (9.2 + 9.5 + 9.2) / 3 [1]

= 9.3 [1]

Accept 8.8 for 1 mark only

g. 3 [1]

Q9. a. Sports injury pack [1]

b. B [1]

c. C [1]

d. Exothermic [1]

Energy has been transferred to the surroundings [1]

OR The products of the reaction have less energy than the reactants

Total for this section: 15 marks

[END OF QUESTIONS]