YEAR 9 SUMMER 2024 – PAPER 2 MARK SCHEME

Section 1 Matter: Particle model of matter

Q1. a. The piece of limestone has an irregular shape [1]

b. (Top pan) balance [1]

c. = 180 / 65 [1]

= 2.77 (2.8) [1]

d. 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 = Rock, Y = Density g/cm^3 [1]
3 bars plotted correctly (within ½ mm) [1]
OR All bars plotted correctly [2]

Q2. a. At random speeds in random directions [1]

b. To prevent (frost/ cold) burns [1]

c. Decreased [1]

Decreased [1]

d. A change of state from liquid to gas [1]

e. = 1440 / 0.0072 [1]

= 200,000 [1]

Total for this section: 15 marks

Section 2 Energy: Energy cost and transfer

Q3. a. Biofuel [1]

Geothermal [1]

b. It is predictable [1]

c. = 60,000 / 60 [1]

= 1000 (W) [1]

Q4. a. Potential [1]

b. = 660 x 25 [1]

= 16,500 [1]

Q5. = 0.6 x 4200 x 22 [1]

= 55,440 (J) [1]

Total for this section: 10 marks

Section 3 Organisms: Cells and Organisation

Q6. Objective lens → To magnify the image of the specimen [1]

Mirror → To direct light into viewers eyes [1]

Q7. Conversion of mm to µm 25 mm = 2500 µm [1]

= 2500 / 800 [1]

= 3.125 µm [1]

If have not converted to µm then allow 1 mark for working out = 25 / 800

And 1 mark for 0.03125, ***if no conversion maximum mark is 2***

Total for this section: 5 marks

Section 4 Bioenergetics: Photosynthesis and respiration

Q8. a. Carbon dioxide + Water → Oxygen + Glucose [1]

b. Chlorophyll [1]

c. 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 of answer	Level descriptor	Marks available
Level 3	The method would lead to the production of a valid outcome. The key steps are identified and logically sequenced.	5 – 6 marks
Level 2	The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.	3 – 4 marks
Level 1	The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1 – 2 marks

Indicative content:

Independent variable – Distance between the lamp and pondweed

Dependent variable – Rate of photosynthesis

Control variable – Mass of pondweed, Type of pondweed, Wattage of bulb, Type of bulb, Colour of bulb, Temperature, Volume of water

- Place the pondweed 10cm from the lamp.
- Turn the lamp on.
- Use the timer to time 1 minute.
- During the 1 minute could the number of bubbles.
- Work out the rate of photosynthesis (number of bubbles per minute).
- Move the pondweed to 20cm from the lamp.
- Repeat the method.
- Repeat for 30cm, 40cm, 50cm, 60cm, 70cm, 80cm, 90cm and 100cm.

Q9. a. Heart rate increases [1]

Deeper/ heavier breathing [1]

b. Contract/ Movement [1]

Ignore strength/ relax

c. Lots of mitochondria [1]

To transfer/ release energy [1]

d. Oxygen [1]

Lactic acid [1]

In this order only

Total for this section: 15 marks

Section 5 Cycles and Interactions: Ecology

Q10. a. Nuts → Birds → Cats [2]

1 mark for organisms in correct order but arrows missing or incorrect

b. Birds [1]

c. Pathogens [1]

Food [1]

d. Structural [1]

Q11.

a. Any one from: Less photosynthesis/ More burning (combustion)/ Decom[position (of wood) [1]

b. Methane [1]

Allow water vapour

c. *Any one from:* Respiration (by animals)/ Fuel burnt in transport/ Fuel burnt to cook [1]

Q12.a. Description of any correct method to achieve randomness. [1]

e.g. Random number generator.

Ignore throwing quadrat

b. Frame/ Square [1]

c. = 72/6 [1]

=12 [1]

d. Less light/ it is shaded [1]

So less photosynthesis [1]

Total for this section: 15 marks

[END OF QUESTIONS]