S1 Integrated Science Practice Paper

S1 - Integrated Science | Time: 60 minutes | Total: 100 marks | 24 parts

Part A: Density and Floating (16 marks)

A piece of metal has a mass of 84 g and a volume of 30 cm³. The density of water is 1.0 g/cm³. Answer items 1 to 4. Each item carries 4 marks.

1. (1) Calculate the density of the metal. (4 marks)

2. (2) When the metal is placed in water, will it float or sink? Explain your answer. (4 marks)

3. (3) A block made of the same metal has a volume of 45 cm³. Find its mass. (4 marks)

4. (4) Another object has a mass of 120 g and floats on water. Find the volume of water it displaces. (4 marks)

Part B: Measurement and Unit Conversion (16 marks)

A length is measured five times in the laboratory: 12.4 cm, 12.6 cm, 12.5 cm, 12.3 cm and 12.7 cm. Answer items 1 to 4. Each item carries 4 marks.

5. (1) Convert 2.5 m to cm. (4 marks)

6. (2) Convert 0.75 kg to g. (4 marks)

7. (3) Convert 3500 mL to L. (4 marks)

8. (4) Calculate the average of the five readings. (4 marks)

Part C: Particle Model and Changes of State (16 marks)

A solid is heated: the temperature rises from 20 °C at minute 0 to 80 °C at minute 6, stays at 80 °C from minute 6 to minute 10, then rises to 120 °C at minute 16. Answer items 1 to 4. Each item carries 4 marks.

9. (1) State the melting point of the substance. (4 marks)

10. (2) The temperature does not change between minute 6 and minute 10. Where does the energy go? (4 marks)

11. (3) How long does the melting process last? (4 marks)

12. (4) Find the average rate of temperature rise from minute 10 to minute 16. (4 marks)

Part D: Microscopy and Cells (16 marks)

The eyepiece of a microscope magnifies 10 times and the objective lens magnifies 40 times. The field of view is 1.8 mm across and one cell is 0.03 mm wide. Answer items 1 to 4. Each item carries 4 marks.

13. (1) What is the total magnification? (4 marks)

14. (2) How many cells fit across the diameter of the field of view? (4 marks)

15. (3) If the objective lens is changed from 10 times to 40 times, what happens to the area of the field of view? (4 marks)

16. (4) Are cell walls and chloroplasts found in plant cells or in animal cells? (4 marks)

Part E: Series Circuits (18 marks)

A 6 V battery is connected in series with two lamps and the current is 0.3 A. Answer items 1 to 4; items 1 and 2 carry 5 marks each and items 3 and 4 carry 4 marks each.

17. (1) Calculate the total resistance of the circuit. (5 marks)

18. (2) One lamp has a resistance of 8 Ω. Find the resistance of the other lamp. (5 marks)

19. (3) Find the current through the second lamp. (4 marks)

20. (4) Calculate the power supplied by the battery. (4 marks)

Part F: Earth, Moon and Seasons (18 marks)

The Moon takes about 29.5 days to go round the Earth once. Assume the new moon appears on day 1. Answer items 1 to 4; items 1 and 2 carry 4 marks each and items 3 and 4 carry 5 marks each.

21. (1) How long does the Earth take to spin once, and what does this cause? (4 marks)

22. (2) How long does the Earth take to orbit the Sun once? (4 marks)

23. (3) Why are the hours of daylight in Hong Kong longer in June than in December? (5 marks)

24. (4) How many days pass from the new moon to the full moon, and on which day does the full moon appear? (5 marks)
