

Check for correct units.

ii. Atoms are spherical ✓

Mass uniformly distributes ✓

4. Weight on Earth = 600N

Weight on Planet = 450N

Weight, $W = Mg$

✓

Correct substitution ✓

Correct answer with correct units ✓

5. The force of cohesion within the mercury is greater than the force of adhesion between mercury and glass ✓. The mercury therefore sinks down ✓the tube to enable mercury molecules to keep together✓.

6. Temperature rise and impurities lower the surface tension of water ✓

7. a)

Check for correct drawing ✓

Check on the curvature ✓

b) The unbalanced ✓ surface tension✓ pulls the thread tight

8. $h = 760\text{mm}$

$\rho = 1.36 \times 10^4 \text{ Kg/m}^3$

$p = ?$

$$p = \rho gh$$

Check on the conversion ✓

Correct substitution ✓

$$P = 103,360 \text{ N/M}^2$$

Accept $P = 103,360 \text{ pa}$ ✓ check for correct units

9. The external pressure (atmospheric) is lower than the internal pressure ✓: therefore the capillaries break ✓.

10. The bottle with hole experiment – if diagram used; check for labeling ✓: Procedure, observation and conclusion ✓.

✓

Lowest jet has highest pressure

Liquid

11. Solid – particles very close, hence low kinetic energy ✓.

Liquids – particles fairly free, moderate kinetic energy ✓

Gases – particles very free, high kinetic energy ✓

12. The metal blade conducts heat from the hand but the wood cannot ✓

13.

$$90 - 48 = 42^\circ \checkmark$$

Drawing a normal

42°

42°

$$14. (20 \times 0.3) + (20 \times 0.3) \checkmark \quad 48^\circ \text{ or } 20 \times 0.6$$

$$6 + 6 = 12 \text{ NM} \checkmark$$

Check for correct units

15. Unlike poles attract while like poles repel ✓

Reject – unlike charges attract while like charges attract

Reject – unlike terms attract while like terms attract

16.



Check for direction of field ✓

Check for presence of the neutral zone ✓

17. This is due to the influence of the Earth's magnetic field ✓

18. Repulsion only occurs between 2 like poles ✓ but attraction may occur between 2 unlike poles or between a magnet and a magnetic materials ✓

SECTION B

19. i. Iron is a soft magnetic material it can easily acquire magnetism and can easily lose magnetism.

ii. Check for correct direction

A

B

iii. A – North pole ✓

B – South pole ✓

iv. Right hand grip rule ✓

- It states that if a coil carrying current is grasped in the right hand such that the fingers point in the direction of current then the thumb points in the direction of North Pole√.
- ii. It would cause overheating on the electromagnet√. This adversely affects the magnetism of the electromagnet√.

20. i. Smoke particles – smoke particles are larger than air molecules and light enough to move when bombarded by air molecules √

Lens – focuses the light from the lamp on the smoke particles, causing them to be observable

Microscope – enlarges/magnifies the smoke particles so that they are visible √

- ii. Smoke particles move randomly/zigzag √
Air molecules bombard the smoke particles
Air molecules are in random motion

- iii. The speed of motion of smoke particles will be observed to be lighter/faster/speed increases√.

21. a) Principle of moments states that for a system in equilibrium, the sum of clockwise moments must be equal to the sum of the anticlockwise moments.

b) 6M



Clockwise moments = Anticlockwise moments

$300 \times 1.5 = X \times 650$ √ (correct substitution 1mk)

√

$X = 0.69M$ √

c)

50

30cm

Taking moments about P

$$\begin{aligned}\text{Distance between P and Q} &= 100 - (20 + 30) \\ &= 100 - 50 \\ &= 50\text{cm} \\ &= 0.5\text{m}\end{aligned}$$

$$F_2 \times 0.5 = 0.3 \times 100$$

Clockwise moments = Anticlockwise moments

$$F_1 + F_2 = 100$$

$$F_1 + 60 = 100$$

$$F_1 = 100 - 60$$

$$F_1 = 40$$

22. a) Mass of water = $66.1 - 42.9$

$$= 23.2$$

$$= 23.2\text{cm}^3$$

Working must be shown

c) Volume of density bottle = volume of water

$$\text{Volume of bottle} = 23.2\text{cm}^3\checkmark$$

d) Mass of soil = $67.2 - 42.9$

$$= 24.3\text{g}\checkmark$$

e) Mass of water that filled the space above the soil

$$= 82.0 - 67.2$$

$$= 14.8\text{g}\checkmark$$

f) Volume of soil

$$\text{Volume of water}\checkmark$$

$$= 14.8\text{cm}^3\checkmark$$

$$\text{Volume of soil} = 23.2 - 14.8$$

$$= 8.4\text{cm}^3\checkmark$$

g) The density of the soil

$$\checkmark$$

$$= 2.893\text{g/cm}^3\checkmark$$

23. a) A – Seal and insulator \checkmark

B – Zinc case \checkmark

C – Mixture of carbon and manganese (IV) oxide \checkmark

D – Carbon rod \checkmark

b) Zinc case acts as a negative electrode \checkmark

c) i) Polarisation \checkmark

Remedy – Adding a depolarizer e.g potassium dichromate \checkmark

ii) Local action \checkmark

Remedy – By amalgamation \checkmark

Accept – use of pure zinc or coating zinc with mercury \checkmark