

Notes for valuers

- Accept answers in the student's own words if the scientific idea is correct.
- Diagrams: give marks for neatness and correct labels; a diagram without labels gets half marks.
- Section D: only one of (A) or (B) is to be valued.

SECTION – A

10 × 1 = 10

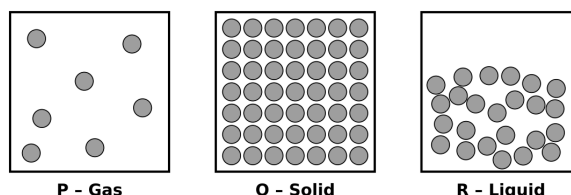
1. B) force
2. C) magnetic force
3. B) newton
4. B) one-sixth
5. C) pascal
6. C) C
7. B) a high-pressure area to a low-pressure area
8. B) electric iron
9. A) a very large current flows
10. A) solids

SECTION – B

3 × 2 = 6

11. The forces act in opposite directions, so net force = 15 N – 6 N = **9 N, towards the right** (in the direction of the larger force).
12. The pressure of a liquid increases with depth. Water at the bottom of the dam exerts the greatest pressure, so the walls are made thicker at the bottom to withstand it.
13. **P – gas, Q – solid, R – liquid.**

Reason (any one): in Q the particles are very closely packed in a regular pattern (solid); in R they are close but can slide over each other (liquid); in P they are far apart and move freely (gas).



SECTION – C

2 × 4 = 8

14. Pressure = Force ÷ Area

[3 + 1]

X: area = 20 × 10 = 200 cm² = 0.02 m²; P = 30 ÷ 0.02 = **1500 Pa**

Y: area = 20 × 5 = 100 cm² = 0.01 m²; P = 30 ÷ 0.01 = **3000 Pa**

Z: area = 10 × 5 = 50 cm² = 0.005 m²; P = 30 ÷ 0.005 = **6000 Pa**

(ii) **Greatest in position Z**, because the same force acts on the smallest area.

15. (i) The iron nail becomes a magnet (electromagnet) and **attracts the pins**. [1 each]
 (ii) The current stops, the nail loses its magnetism and **the pins fall**.
 (iii) Increase the number of turns of the coil; use more cells (larger current).
 (iv) Cranes that lift scrap iron, electric bells, loudspeakers, separating iron from waste (any one).

SECTION – D

2 × 8 = 16

16. A) **Contact forces** act only when objects touch: muscular force (lifting a bag, pushing a cart), friction (a rolling ball slows down). [4 + 4]

Non-contact forces act from a distance: magnetic force (magnet pulling iron pins), gravitational force (a fruit falling), electrostatic force (a rubbed balloon attracting bits of paper).

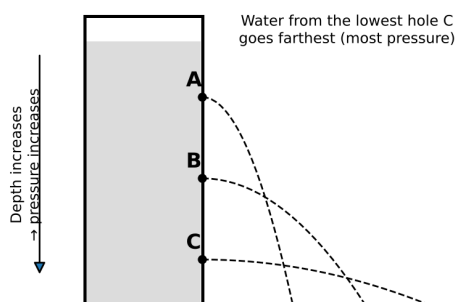
Mass is the amount of matter in an object; it does not change from place to place.

Weight is the force with which a planet or the Moon pulls the object. The Moon's pull is about one-sixth of the Earth's, so the weight becomes about one-sixth, while the mass stays the same.

16. B) (i) Take a plastic bottle and make holes around it at the same height. Fill it with water. Water comes out of all holes with equal force → **liquids exert pressure on the walls of the container, equally at the same depth**. [3 + 3 + 2]

(ii) Make three holes A, B, C one above the other and fill the bottle. Water from the lowest hole C goes farthest and from A the least → **pressure increases with depth**.

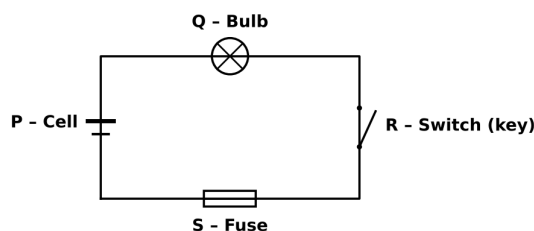
Diagram:



17. A) P – cell, Q – bulb, R – switch (key), S – fuse. [2 + 2 + 4]

Fuse: a wire of low melting point. If too much current flows (short circuit or overloading), the wire melts and breaks the circuit, protecting appliances and preventing fire.

Precautions (any four): do not touch switches with wet hands; do not overload a socket; use ISI-marked wires and fuses/MCBs; never touch bare wires; switch off the mains before repairs; keep children away from sockets.



17. B) Put a few crystals of potassium permanganate in 100 mL of water; the whole water turns purple. Take 10 mL of it into 90 mL of fresh water, and repeat several times. The water is still coloured. [3 + 2 + 3]

Conclusion: one crystal contains millions of very tiny particles that spread through the water → **matter is made of very small particles**.

Sugar dissolves in water without the level rising much → **there are spaces between particles** of water, into which sugar particles fit.

The smell of an incense stick spreads because its gas particles move constantly and mix with the particles of air. This mixing is called **diffusion**; it is faster in hot air.

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