

Date: September 9, 2025

Answer key Sub- Science Assignment Class -IX

1 b

2 d

3 a

4 Mitosis and Meiosis

5 (i) MI

(ii) Since, nitrogen has a valency of -3, it is trivalent, hence, the formula for nitride is M_3N .

(iii) M_3PO_4

6 (A) Tree trunks are made up of cork that serves as a protective tissue.

(B) Epidermis

- Made up of living cells.
- Cells are arranged in a single layer.

Cork

- Made up of dead cells.
- Cells are arranged in multiple layers.

(C) Suberin is the component that is present in the cork cells. The cork cells die as the stem or root reaches maturity, and the outer border replaces the epidermal layer. Water and gases cannot escape the cork cells because of the suberin. It safeguards the cork cells found in tree bark.

7 a

8 a

9 (a) Newton's Third Law of Motion — action and reaction are equal and opposite.

(b) When the foot exerts a force on the ball (action), the ball exerts an equal and opposite force on the foot (reaction). This reaction force over a short contact time (large impulse) causes stress/pain in the foot, especially if it's not cushioned (barefoot/poor shoes).

(c) Momentum imparted:

$$P = mv$$

$$= 0.5 (20)$$

$$= 10 \text{ kgm/s}$$

10 (a) In a vacuum tube, both the stone and the feather fall at the same rate and reach the bottom simultaneously.

(b) In air, the feather falls much more slowly because of air resistance, while the stone falls quickly. In vacuum, there is no air resistance, so both fall equally fast.

(c) This experiment proves that the acceleration due to gravity (g) is the same for all objects, irrespective of their mass or size, when air resistance is absent.

(d) Mass is not a factor in free fall because the force of gravity ($F = mg$) and the inertia of the object (resistance to motion, proportional to m) cancel each other when calculating acceleration:

Thus, all bodies fall with the same acceleration g in vacuum.