



Botany: The Living World

Zoology: Animal Kingdom

Chemistry: Some Basic Concepts of Chemistry

Physics: Units & Measurements

Solution

1. **Answer:** (3)

2. **Answer:** (3)

3. **Answer:** (2)

4. **Answer:** (4)

5. **Answer:** (4)

6. **Answer:** (2)

7. **Answer:** (1)

8. **Answer:** (2)

9. **Answer:** (3)

10. **Answer:** (3)

11. **Answer:** (1)

Solution:

Counting numbers of object have Infinite significant figures.

12. **Answer:** (3)

Solution:

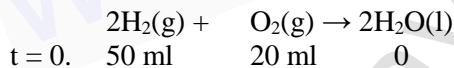
1 electron = m_e kg

\therefore Number of electrons in 1 kg = $\frac{1}{m_e}$ electrons

\therefore Mole of electrons = $\frac{\left(\frac{1}{m_e}\right)}{N_A} = \frac{1}{m_e N_A}$

13. **Answer:** (2)

Solution:



t = 0. 50 ml 20 ml 0

Final 10 ml 0

\therefore Reduction in volume of gases = $[50+20]-[10]=60\text{ml}$

14. **Answer:** (3)

Solution:

$$n_{\text{CO}_2} = \frac{11.2 \times 10^{-3}}{22.4} = 5 \times 10^{-4} \text{ mol.}$$

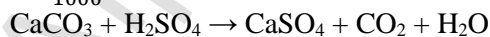
Number of atoms = $3 \times 5 \times 10^{-4} \times N_A = 1.5 \times 10^{-3} N_A$

15. **Answer:** (2)

Solution:

Moles of $\text{H}_2\text{SO}_4 = M \times V(\text{L})$

$$= \frac{0.5 \times 100}{1000} = 0.05 \text{ mol}$$



1 mol $\text{CaCO}_3 \equiv$ 1 mol H_2SO_4

\therefore 0.05 mol of H_2SO_4 will react with = 0.05 mol of CaCO_3

Mass of $\text{CaCO}_3 \Rightarrow 0.05 \times 100 = 5 \text{ g}$

16. **Answer:** (2)

$$\begin{aligned} \frac{\Delta P}{P} \times 100 &= \frac{\Delta a}{a} \times 100 + \frac{\Delta b}{b} \times 100 + \frac{5}{2} \cdot \frac{\Delta c}{c} \times 100 \\ &+ \frac{1}{2} \cdot \frac{\Delta d}{d} \times 100 \\ &= 1\% + 2\% + \frac{5}{2} \times 3\% + \frac{1}{2} \times 4\% = 12.5\% \end{aligned}$$

17. **Answer:** (2)

$$m \propto G^a h^b C^c$$

$$[\text{M L}^0 \text{T}^0] = [\text{M}^{-1} \text{L}^3 \text{T}^{-2}]^a [\text{M L}^2 \text{T}^{-1}]^b [\text{L T}^{-1}]^c$$

$$-a + b = 1$$

$$3a + 2b + c = 0$$

$$-2a - b - c = 0$$

On solving

$$a = -\frac{1}{2}, \quad b = \frac{1}{2}, \quad c = \frac{1}{2}$$

$$\text{Then } \frac{a^2}{bc} = 1$$

18. **Answer:** (4)

$$[\text{Time}] = [RC] = \left[\frac{L}{R}\right] = [\sqrt{LC}]$$

19. **Answer:** (1)

$$L = \frac{nh}{2\pi}$$

$$[L] = [h]$$

20. **Answer:** (1)

$$[\text{M L}^2 \text{T}^{-2}] = D^a F^b V^c$$

$$[\text{M L}^2 \text{T}^2] = [\text{M L}^{-3}]^a [\text{T}^{-1}]^b [\text{L T}^{-1}]^c$$

$$\Rightarrow a = 1, \quad b = -3, \quad c = 5.$$