

1. (2) If we are adding two physical quantities their dimension should be same
2. (4) Area should have 2 significant figures
3. (1) % error in density = % error in mass + 3(% error in length)
 $= 3 + 3.2 = 9\%$
4. (2) % error in R = % error in V + (% error in I)
 $= 5 + 2 = 7\%$
5. (4) Use chain rule
6. (3) Use chain rule
7. (3) Integrate, $a = dv/dt$
8. (2) $A \cdot B = 0$
9. (3) $A \cdot B = 50, A = 5, B = 10$
10. (3) Magnitude of unit vector is always 1
11. (3) $R^2 = (3p)^2 + (2p)^2 + 2 \cdot 3p \cdot 2p \cos X$
 $(2R)^2 = (6p)^2 + (2p)^2 + 2 \cdot 6p \cdot 2p \cos X$
12. (1) $\tan X = \text{perpendicular} / \text{adjacent}$
13. (1) $(2i - j + 3k) \cdot (2i - 5j - 3k) = 2 \cdot 2 + (-1)(-5) + 3(-3) = 0$
14. (3) $v = dx/dt, a = dv/dt, t = 0$
15. (1) $\int (2t - 2) = t^2 - 2t$
16. (2) $S = ut + \frac{1}{2} at^2$
17. (1) A body can have acceleration even if velocity is zero
18. (2) $v = (80t + 10t)/2t$
19. (4) $T = 2u \sin X/g$
20. (2) $R = \frac{u^2 \sin 2\theta}{g}$

21. (3)

$$n = \frac{54}{27} = \frac{W_{Mg}}{24} \Rightarrow W_{Mg} \approx 48 \text{ gm}$$

22. (1)

$$\text{No. of atoms} = \frac{1}{50} \times N_A \times 14$$

23. (3)

$$n = \frac{11.2}{22.4} = \frac{14}{M} \Rightarrow M = 28$$

24. (1)

$$\frac{W_{Mg}}{M} \times 100 = 0.376$$

$$M = \frac{56 \times 100}{0.376} \approx 14800$$

25. (2)

1 mole S_8 can produce 8 mole SO_3

$$W_{SO_3} = 8 \times 80 = 640$$

26. (2)

Theory

27. (1)

Isobars: same no. of p + n.

28. (1)

$$V \propto \frac{1}{n}$$

29. (1)

$$\frac{1}{\lambda_4} = R \left(\frac{1}{2^2} - \frac{1}{6^2} \right) \Rightarrow \lambda_4 = \frac{9}{2R}$$

$$\frac{1}{\lambda_5} = R \left(\frac{1}{2^2} - \frac{1}{7^2} \right) \Rightarrow \lambda_5 = \frac{196}{45R}$$

$$\lambda_4 - \lambda_5 = \frac{0.144}{R} = 1.31 \times 10^{-8}$$

$$\approx 131 \overset{\circ}{\text{A}}$$

30. (3)

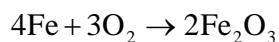
$$n \neq \ell$$

31. (1)

	%	%/M	
C	70.8	$\frac{70.8}{12} = 5.9$	$\frac{5.9}{0.292} \approx 20$
H	6.2	$\frac{6.2}{1} = 6.2$	$\frac{6.2}{0.292} \approx 21$
N	4.1	$\frac{4.1}{14} = 0.292$	1
O	18.9	$\frac{18.9}{16} = 1.18$	$\frac{1.18}{0.292} = 4$

$C_2H_{21}NO_4$

32. (3)



$$\frac{x/56}{4} = \frac{10/32}{3}$$

$$x = 23.3$$

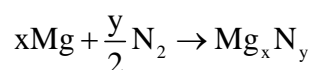
33. (1)

$$n_{\text{KCl}} = 0.5 \times \frac{100}{1000} = \frac{100}{1000} \times 0.4 + n_{\text{KCl}}^1$$

$$n_{\text{KCl}}^1 = 0.01$$

$$W_{\text{KCl}}^1 = 0.745 \text{ gm}$$

34. (1)



$$0.273 \qquad \qquad 0.378$$

Mole method

$$\frac{0.273}{x \times 24} = \frac{0.378}{24x + 14y}$$

$$\frac{x}{y} = \frac{3}{2}$$

35. (3)

HCl will be limiting reagent

$$\frac{n_{\text{HCl}}}{4} = \frac{n_{\text{Cl}_2}}{1}$$

$$W_{\text{Cl}_2} = \frac{1}{36.5 \times 4} \times 71 = 0.486 \text{ gm}$$

36. (3)

Theory

37. (3)

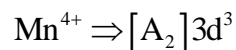
5th shell

As $\ell = 4$ (g-subshell) is possible first in $n = 5$

38. (1)

Theory

39. (4)



$$n = 3$$

40. (1)

According to Aufbau's principle