

NEET ANSWER KEY & SOLUTIONS

SUBJECT :- CHEMISTRY

CLASS :- 12th

PAPER CODE :- CWT-3

CHAPTER :- CHEMICAL KINETICS

ANSWER KEY

1. (B)	2. (B)	3. (B)	4. (D)	5. (A)	6. (D)	7. (B)
8. (D)	9. (B)	10. (D)	11. (C)	12. (C)	13. (B)	14. (C)
15. (A)	16. (B)	17. (C)	18. (A)	19. (B)	20. (B)	21. (C)
22. (B)	23. (C)	24. (D)	25. (A)	26. (B)	27. (B)	28. (A)
29. (B)	30. (B)	31. (D)	32. (A)	33. (B)	34. (A)	35. (B)
36. (C)	37. (D)	38. (B)	39. (B)	40. (B)	41. (D)	42. (C)
43. (B)	44. (A)	45. (B)	46. (B)	47. (A)	48. (B)	49. (B)
50. (B)						

SOLUTIONS

SECTION-A

1. (B)

Sol. $x A + y B \longrightarrow z C$

$$\frac{-d}{dt} [A] = \frac{-d}{dt} [B] = 1.5 \frac{-d}{dt}$$

$\longrightarrow [C]$

$$\Rightarrow \frac{-1}{3} \frac{-d}{dt} [A] = \frac{-1}{3} \frac{-d}{dt} [B] = \frac{1}{2}$$

$$\frac{-d}{dt} [C]$$

$$x = 3 \qquad y = 3 \qquad z = 2$$

2. (B)

Sol. $\frac{1}{2} \frac{d[C]}{dt} = -\frac{1}{3} \frac{d[D]}{dt} = \frac{1}{4} \frac{d[A]}{dt} = \frac{-d[B]}{dt}$

B & D will be same side and A & C will be same state ratio of stoichiometric coefficient

$$B:D : A : C = 1 : 3 : 4 : 2.$$

3. (B)

Sol. $3A \rightarrow 2B, \frac{-1}{2} \frac{d[A]}{dt} = \frac{1}{2} \frac{d[B]}{dt}$

4. (D)

Sol. $A + 2B \longrightarrow 3C + D$

$$\frac{-d[A]}{dt} = \frac{-1}{2} \frac{d[B]}{dt} = \frac{+1}{3} \frac{d[C]}{dt} = \frac{+d[D]}{dt}$$

5. (A)

6. (D)

Sol. $\frac{d}{dt} [SO_3] = 100 \text{ gram / min} = \frac{100}{80} \text{ mole / min} = 1.25 \text{ mole/min.}$

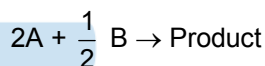
$$\frac{-1}{2} \frac{d}{dt} [SO_2] = \frac{-d}{dt} [O_2] = \frac{1}{2} \frac{d}{dt} [SO_3]$$

$$\frac{-d}{dt} [O_2] = \frac{1.25}{2} \text{ mole/min} = \frac{1.25}{2} \times 32 \text{ gram/min} = 20 \text{ gram/min}$$

7. (B)

Sol. $R = k [A]^a [B]^b$

acc. to data, $a = 2, b = \frac{1}{2}$



$$-\frac{1}{4} \frac{d[A]}{dt} = \frac{-d[B]}{dt}$$

8. (D)

Sol. Overall order = $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{13}{12}$.

9. (B)

Sol. Rate of reaction is independent of concentration of reactant for zero order reaction.

10. (D)

Sol. $R = K [A] [B]$

Order wrt. A = 1 & above wrt. B = 1

K depends on temperature

$$R = K [A] [B]$$

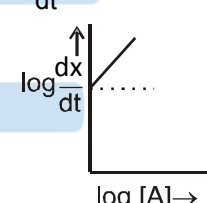
11. (C)

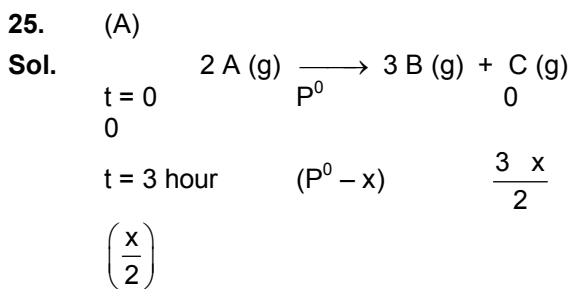
Sol. $A + B \rightarrow \text{Products}$

$$R = k [A]^2 [B]^3$$

$$R' = R \cdot 2^2 [A]^2 \cdot 2^3 [B]^3 = 2^5 R = 32R$$

12. (C)
Sol. Unit of k is $L \text{ mol}^{-1} \text{ sec}^{-1}$
 so order is 2.
13. (B)
Sol. $t = \frac{2.303}{K} \log \frac{C_0}{C_t} \Rightarrow t$
 $= \frac{2.303}{K} [\log C_0 - \log C_t]$
 $\frac{K t}{2.303} = \log C_0 - \log C_t \Rightarrow C_t$
 $= \left(\frac{-K}{2.303} \right) t + \log C_0$
 So slope = $\left(\frac{-K}{2.303} \right)$
14. (C)
Sol. According to graph given it would be zero order reaction so rate independent of time.
15. (A)
Sol. $N_2O_5 \rightarrow 2NO_2 + \frac{1}{2} O_2$
 $R = K [N_2O_5]$
 $R = 6.2 \times 10^{-4} \text{ S}^{-1} \times 1.25 \text{ mole L}^{-1}$
 $= 7.75 \times 10^{-4} \text{ mole L}^{-1} \text{ S}^{-1}$
16. (B)
Sol. Equal amount of Rxn completed in equal time property as zero order Rxn, and unit as Rate constant $\text{mole Litre}^{-1} \text{ sec}^{-1}$
17. (C)
Sol. Unit of rate constant is $(\text{time})^{-1}$. Hence first order reaction.
 Time required to change concentration 1 M to 0.25 M = $2 \times t_{1/2} = 2 \times \frac{\ln 2}{k} = 20 \text{ min.}$
18. (A)
Sol. $A + B \rightarrow \text{product}$
 $r = K [A]^1 [B]^2$
 $r_1 = K [1]^1 [1]^2 = 1 \times 10^{-2} \quad (K = 1 \times 10^{-2})$
 $r_1 = K \left[\frac{1}{2} \right] \left[\frac{1}{2} \right]^2 = 1 \times 10^{-2} \times \frac{1}{8} = 1.25 \times 10^{-3}$
19. (B)
Sol. Reaction is zero order (unit of k)
 $[B] = 2 \times \text{moles of A reacted}$
 $[B] = 2 \times kt = 0.2 \text{ mol lit}^{-1}$

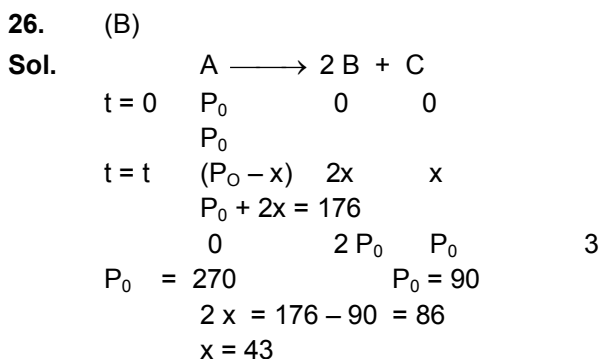
20. (B)
Sol. $t_{1/2} = 10 \quad \text{No. of Half life} = \frac{60}{10} = 6$
 half life $C_t = \frac{C_0}{(2)^n} = \frac{C_0}{(2)^6} = \left(\frac{C_0}{64} \right)$
21. (C)
Sol. It is properties of 1st order Rxn and other all are properties of 2nd order.
22. (B)
Sol. $A + B \rightarrow C$
 $R = k [A]^m [B]^n$
 compare exp. (A) & (B)
 $\frac{0.1}{0.8} = \left(\frac{1}{2} \right)^n \Rightarrow m = 3$
 compare exp. (B) & (D)
 $\frac{0.8}{0.8} = \left(\frac{1}{2} \right)^n \quad n = 0 \quad \text{so. } R =$
 $K[A]^3$
23. (C)
Sol. $\frac{dx}{dt} = K[A]^2$

 $\log \frac{dx}{dt} = 2 \log [A] + \log k$
 compare with $y = mx + c$ graph obtained
24. (D)
Sol. $A (s) \rightarrow 2 B (g) + C (g)$
 $K = \frac{1}{t} \ln \left(\frac{P_\infty - P_0}{P_\infty - P_t} \right) \quad P_0 = 0$
 $P_t = 150 \quad P_\infty = 225$
 $\frac{1}{20} \ln \left[\frac{225}{225 - 150} \right]$
 $\Rightarrow \frac{1}{20} \ln \left(\frac{225}{75} \right) = 0.05 \ln 3$
 $\frac{1}{20} \ln \left(\frac{225}{75} \right) = \frac{1}{20} \ln \left(\frac{225}{225 \times P_{40}} \right)$
 $\Rightarrow \left(\frac{225}{75} \right)^2 = \frac{225}{225 \times P_{40}}$
 $\frac{225}{75 \times 75} = \frac{1}{225 - P_{40}}$
 $\Rightarrow P_{40} = 200$



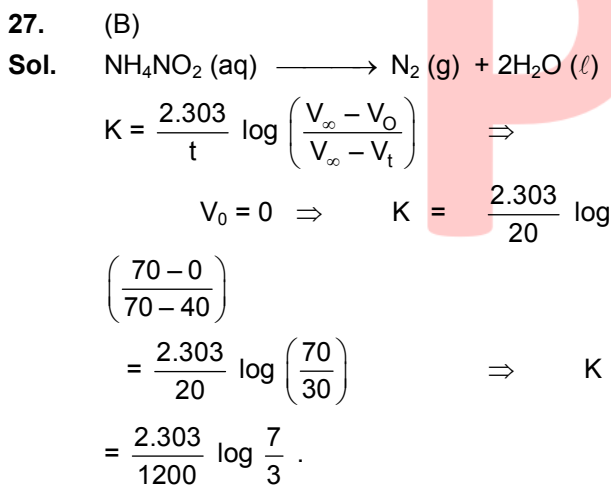
$$(P^0 + x) = 2 P^0$$

$$x = P^0$$

Reaction is completed in limited time so reaction is zero order reaction.

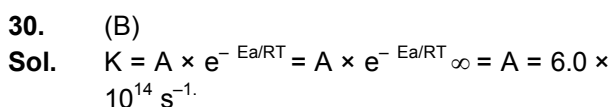


Pressure of A after 10 minute = $90 - 43 = 47$



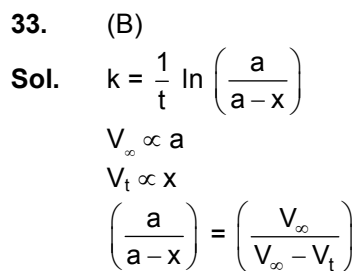
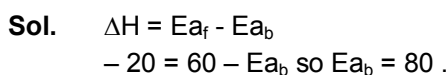
28. (A)
Sol. Rate increases as temperature increases.

29. (B)

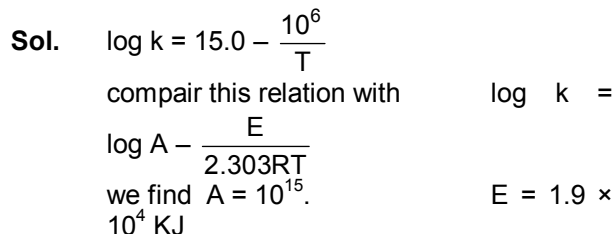


31. (D)

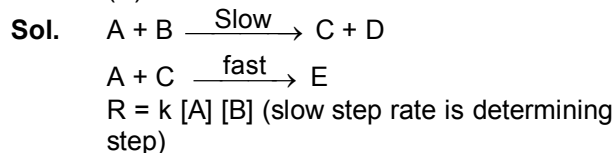
32. (A)



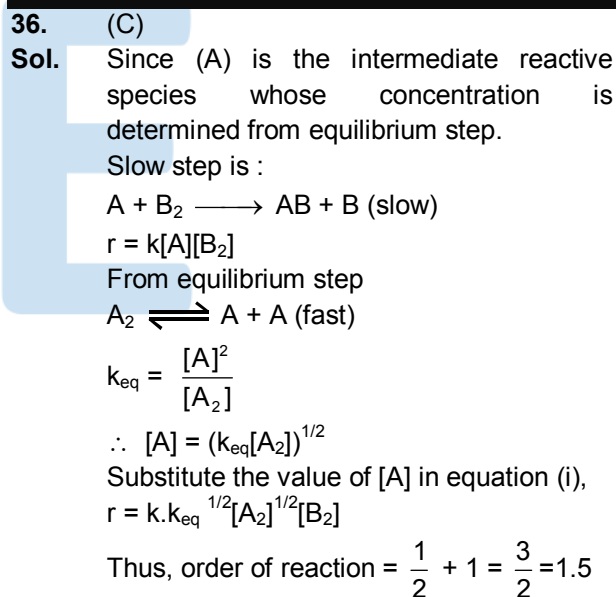
34. (A)



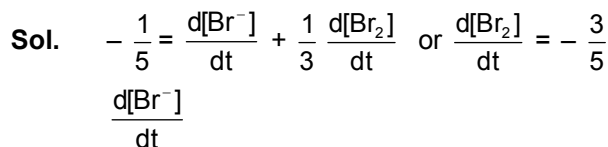
35. (B)



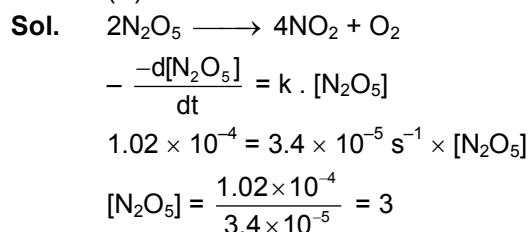
SECTION-B



37. (D)



38. (B)



39. (B)
Sol. Unit of K is mole L⁻¹ Sec⁻¹
 So order is 0.
40. (B)
Sol. As given, it is an elementary reaction.
41. (D)
Sol. $K = \frac{1}{t} \left[\ln \frac{a}{a-x} \right] = \frac{2.303}{t} \log \frac{a}{a-x}$
 $K = \frac{2.303}{20} \log \frac{1}{0.25} = \frac{2.303}{20} \log \frac{4}{1} = 0.0693 \text{ min}^{-1}$
42. (C)
Sol. $K = Ae^{-E/RT}$
43. (B)
Sol. $K_1 = A_1 e^{-E_1/RT}$ and $K_2 = A_2 e^{-E_2/RT}$
 $\frac{K_1}{K_2} = \frac{A_1}{A_2} = e^{(E_2 - E_1)/RT}$; A_1 and A_2 are not given.
44. (A)
Sol. Half life is not depend upon initial concentration.
45. (B)
 (A) 4 (B*) 3 (C) 2 (D) 1
Sol. $M \longrightarrow N$
 $r = K [M]^x$
 as $[M]$ is doubled, rate increases by a factor of 8.
 i.e. $8r = K [2M]^x$
 $\Rightarrow 8 = (B)^x$
 $x = 3$

46. (B)
Sol. $2A + B \longrightarrow \text{products}$
 $r = K[A]^x [B]^y$
 $0.3 = K[A]^x [B]^y \dots (A)$
 $2.4 = K[2A]^x [2B]^y \dots (B)$
 $\frac{(2)}{(1)} \Rightarrow 8 = 2^x \times 2^y$
 (1)
 Or, $8 = 2^{x+y} \Rightarrow x + y = 3$
 $x = 1 \therefore y = 2$
47. (A)
Sol. (A) For a first order reaction,
 $K = \frac{2.303}{t} \log \frac{a}{a-x}$, where a is initial concentration, and x is the amount reacted in time t . For half-life $x = a/2$, $t = t_{1/2}$
 $K = \frac{2.303}{K} \log \frac{a}{a-a/2}$
 $t_{1/2} = \frac{2.303}{K} \log 2 = \frac{0.693}{K}$.
48. (B)
Sol. (B) For a zero order reaction,
 $t_{1/2} = [A_0] / 2K$.
49. (B)
Sol. (B) According to Arrhenius equation,
 $K = Ae^{-E_a/RT}$ when $E_a = 0$, $K = A$.
50. (B)
Sol. (B) Molecularity of a reaction can be defined only for an elementary reaction because complex reaction does not take place in one single step and it is almost impossible for all the total molecules of the reactants to be in a state of encounter simultaneously.