

NEET : CHAPTER WISE TEST-3

SUBJECT :- CHEMISTRY

CLASS :- 12th

CHAPTER :- CHEMICAL KINETICS


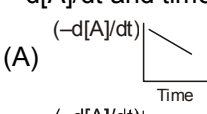
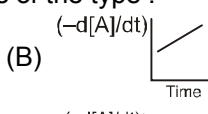
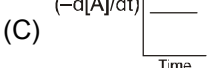
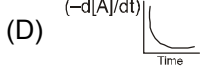
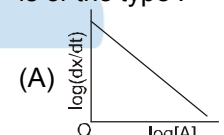
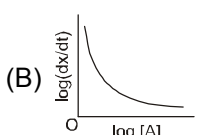
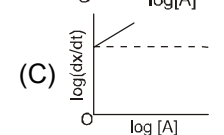
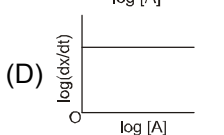
DATE.....

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SECTION.....

(SECTION-A)

1. $x\text{A} + y\text{B} \rightarrow z\text{C}$. If $-\frac{d[\text{A}]}{dt} = -\frac{d[\text{B}]}{dt} \cdot 1.5 = \frac{d[\text{C}]}{dt}$ then x,y and z can be :
 (A) 1,1,1 (B) 3,2,3
 (C) 3,3,2 (D) 2,2,3
2. The rate of a reaction is expressed in different ways as follows ;
 $+ 1/2(d[\text{C}]/dt) = - 1/3 (d[\text{D}]/dt) = + 1/4 (d[\text{A}]/dt) = - (d[\text{B}]/dt)$ The reaction can be :
 (A) $4\text{A} + \text{B} \longrightarrow 2\text{C} + 3\text{D}$
 (B) $\text{B} + 3\text{D} \longrightarrow 4\text{A} + 2\text{C}$
 (C) $4\text{A} + 2\text{B} \longrightarrow 2\text{C} + 3\text{D}$
 (D) $\text{B} + (1/2)\text{D} \longrightarrow 4\text{A} + 3\text{C}$
3. $3\text{A} \rightarrow 2\text{B}$, rate of reaction $\frac{+d[\text{B}]}{dt}$ is equal to :
 (A) $-\frac{3}{2} \frac{d[\text{A}]}{dt}$ (B) $-\frac{2}{3} \frac{d[\text{A}]}{dt}$
 (C) $-\frac{1}{3} \frac{d[\text{A}]}{dt}$ (D) $+2 \frac{d[\text{A}]}{dt}$
4. In the reaction; $\text{A} + 2\text{B} \longrightarrow 3\text{C} + \text{D}$, which of the following expression does not describe changes in the concentration of various species as a function of time :
 (A) $\{d[\text{C}]/dt\} = -\{3d[\text{A}]/dt\}$
 (B) $\{3d[\text{D}]/dt\} = \{d[\text{C}]/dt\}$
 (C) $\{3d[\text{B}]/dt\} = -\{2d[\text{C}]/dt\}$
 (D) $\{2d[\text{B}]/dt\} = -\{d[\text{A}]/dt\}$
5. Which of the following statements is correct?
 (A) The rate of a reaction decreases or remain constant with passage of time as the concentration of reactants dereases.
 (B) The rate of a reaction is same at any time during the reaction.
 (C) The rate of a reaction is independent of temperature change.
 (D) The rate of a reaction decreases with increase in concentration of reactant(s).
6. Rate of formation of SO_3 in the following reaction $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$ is 100 g min^{-1} . Hence rate of disappearance of O_2 is :
 (A) 50 g min^{-1} (B) 40 g min^{-1}
 (C) 200 g min^{-1} (D) 20 g min^{-1}
7. $a\text{A} + b\text{B} \longrightarrow \text{Product}$, $dx/dt = k[\text{A}]^a [\text{B}]^b$. If conc of A is doubled, rate is four times. If conc. of B is made four times, rate is doubled. What is relation between rate of disappearance of A and that of B ?
 (A) $\{-d[\text{A}]/dt\} = \{-d[\text{B}]/dt\}$
 (B) $\{-d[\text{A}]/dt\} = -4\{d[\text{B}]/dt\}$
 (C) $-4\{d[\text{A}]/dt\} = \{-d[\text{B}]/dt\}$
 (D) None of these
8. The rate of certain hypothetical reaction $\text{A} + \text{B} + \text{C} \rightarrow \text{products}$ is given by $r = \frac{-d[\text{A}]}{dt} = k[\text{A}]^{1/2}[\text{B}]^{1/3}[\text{C}]^{1/4}$ The order of the reaction :
 (A) 1 (B) $\frac{1}{2}$
 (C) 2 (D) $\frac{13}{12}$
9. $2\text{A} \rightarrow \text{B} + \text{C}$ it would be a zero order reaction when :
 (A) The rate of reaction is proportional to square of conc. of A
 (B) The rate of reaction remains same at any conc. of A
 (C) The rate remains unchanged at any conc. of B and C
 (D) The rate of reaction doubles if conc. of B is increased to double
10. The rate equation for the reaction $2\text{A} + \text{B} \rightarrow \text{C}$ is found to be : rate $k[\text{A}][\text{B}]$. The correct statement in relation to this reaction is that the
 (A) Rate of formation of C is twice the rate of disappearance of A.
 (B) Half life is a constant
 (C) Unit of k must be s^{-1}
 (D) Value of k is independent of the initial concentration of A and B
11. For the reaction $\text{A} + \text{B} \rightarrow \text{Products}$, it is found that the order of A is 2 and of B is 3 in the rate expression. When concentration of both is doubled the rate will increase by a factor of :
 (A) 10 (B) 6 (C) 32 (D) 16
12. The rate constant of reaction $2\text{A} + \text{B} \longrightarrow \text{C}$ is $2.57 \times 10^{-5} \text{ lt mole}^{-1} \text{ sec}^{-1}$ after 10 sec. $2.65 \times 10^{-5} \text{ lt. mole}^{-1} \text{ sec}^{-1}$ after 20 sec. and $2.55 \times 10^{-5} \text{ lt. mole}^{-1} \text{ sec}^{-1}$ after 30 sec. The order of the reaction is:
 (A) 0 (B) 1 (C) 2 (D) 3
13. For a first order reaction, the plot of 't' against $\log C$ gives a straight line with slope equal to :
 (A) $(k / 2.303)$ (B) $(-k / 2.303)$
 (C) $(\ln k / 2.303)$ (D) $-k$.

14. Graph between concentration of the product and time of the reaction $A \rightarrow B$ is of the type  Hence graph between $-d[A]/dt$ and time will be of the type :
- (A)  (B) 
 (C)  (D) 
15. The reaction N_2O_5 (in CCl_4) $\rightarrow 2NO_2 + 1/2O_2(g)$ is first order in N_2O_5 with rate constant $6.2 \times 10^{-4} S^{-1}$. What is the value of rate of reaction when $[N_2O_5] = 1.25$ mole L^{-1}
- (A) $7.75 \times 10^{-4} \text{ mol } L^{-1} S^{-1}$
 (B) $6.35 \times 10^{-3} \text{ mol } L^{-1} S^{-1}$
 (C) $5.15 \times 10^{-5} \text{ mol } L^{-1} S^{-1}$
 (D) $3.85 \times 10^{-4} \text{ mol } L^{-1} S^{-1}$
16. In a certain reaction, 10% of the reactant decomposes in one hour, 20 % in two hours, 30% in three hours and so on the dimensions of the rate constant is :
- (A) hour^{-1}
 (B) $\text{mole litre}^{-1} \text{ sec}^{-1}$
 (C) $\text{litre mole}^{-1} \text{ sec}^{-1}$
 (D) mole sec^{-1}
17. The rate constant for a reaction is $\frac{\ln 2}{10} \text{ min}^{-1}$. What will be the order of reaction and time taken to change concentration from 1 M to 0.25 M.
- (A) one, 10 min (B) zero, 10 min
 (C) one, 20 min (D) two, 20 min
18. For the irreversible process, $A + B \longrightarrow$ products, the rate is first-order w.r.t. A and second-order w.r.t. B. If 1.0 mol each of A and B introduced into a 1.0 L vessel, and the initial rate was $1.0 \times 10^{-2} \text{ mol } L^{-1} s^{-1}$, rate when half reactants have been turned into products is :
- (A) $1.25 \times 10^{-3} \text{ mol } L^{-1} s^{-1}$
 (B) $1.0 \times 10^{-2} \text{ mol } L^{-1} s^{-1}$
 (C) $2.50 \times 10^{-3} \text{ mol } L^{-1} s^{-1}$
 (D) $2.0 \times 10^{-2} \text{ mol } L^{-1} s^{-1}$
19. The rate constant of the reaction $A \rightarrow 2B$ is $1.0 \times 10^{-3} \text{ mol lit}^{-1} \text{ min}^{-1}$, if the initial concentration of A is 1.0 mole lit^{-1} what would be the concentration of B after 100 minutes.
- (A) 0.1 mol lit^{-1} (B) 0.2 mol lit^{-1}
 (C) 0.9 mol lit^{-1} (D) 1.8 mol lit^{-1}
20. In a first order reaction the reacting substance has half-life period of ten minutes. What fraction of the substance will be left after an hour the reaction has occurred ? :
- (A) 1/6 of initial concentration
 (B) 1/64 of initial concentration
 (C) 1/12 of initial concentration
 (D) 1/32 of initial concentration
21. Which is not true for a second order reaction ?
- (A) It can have rate constant $1 \times 10^{-2} L \text{ mol}^{-1} s^{-1}$
 (B) Its half-life is inversely proportional to its initial concentration
 (C) Time to complete 75% reaction is twice of half-life
 (D) $T_{50} = \frac{1}{K \times \text{Initial conc.}}$
22. The data for the reaction $A + B \rightarrow C$ is
- | Exp. | $[A]_0$ | $[B]_0$ | initial rate |
|------|---------|---------|--------------|
| 1 | 0.012 | 0.035 | 0.10 |
| 2 | 0.024 | 0.035 | 0.80 |
| 3 | 0.012 | 0.070 | 0.10 |
| 4 | 0.024 | 0.070 | 0.80 |
- (A) $r = k [B]^3$ (B) $r = k [A]^3$
 (C) $r = k [A] [B]^4$ (D) $r = k [A]^2 [B]^2$
23. $A \rightarrow \text{Product}$ and $\left(\frac{dx}{dt}\right) = k[A]^2$. If $\log \left(\frac{dx}{dt}\right)$ is plotted against $\log [A]$, then graph is of the type :
- (A)  (B) 
 (C)  (D) 
24. The reaction $A(s) \rightarrow 2 B(g) + C(g)$ is first order. The pressure after 20 min. and after very long time are 150 mm Hg and 225 mm Hg. The value of rate constant and pressure after 40 min. are :
- (A) $0.05 \ln 1.5 \text{ min}^{-1}$, 200 mm
 (B) $0.5 \ln 2 \text{ min}^{-1}$, 300 mm
 (C) $0.05 \ln 3 \text{ min}^{-1}$, 300 mm
 (D) $0.05 \ln 3 \text{ min}^{-1}$, 200 mm
25. Consider the reaction $2A(g) \longrightarrow 3B(g) + C(g)$. Starting with pure A initially, the total pressure doubled in 3 hrs. The order of the reaction might possibly be
- (A) zero
 (B) first
 (C) second
 (D) unpredictable from this data

26. At 373 K, a gaseous reaction $A \rightarrow 2B + C$ is found to be of first order. Starting with pure A, the total pressure at the end of 10 min. was 176 mm and after a long time when A was completely dissociated, it was 270 mm. The pressure of A at the end of 10 minutes was :
- (A) 94 mm (B) 47 mm
(C) 43 mm (D) 90 mm
27. In the reaction $\text{NH}_4\text{NO}_2(\text{aq.}) \rightarrow \text{N}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$ the volume of N_2 after 20 min and after a long time is 40 ml and 70 ml respectively. The value of rate constant is :
- (A) $(1/20) \ln(7/4) \text{ min}^{-1}$
(B) $(2.303/1200) \log(7/3) \text{ sec}^{-1}$
(C) $(1/20) \log(7/3) \text{ min}^{-1}$
(D) $(2.303/20) \log(11/7) \text{ min}^{-1}$
28. For a zero order reaction. Which of the following statement is false :
- (A) the rate is independent of the temperature of the reaction.
(B) the rate is independent of the concentration of the reactants.
(C) the half life depends as the concentration of the reactants.
(D) the rate constant has the unit $\text{mole l}^{-1} \text{ sec}^{-1}$.
29. A large increase in the rate of a reaction for a rise in temperature is due to
- (A) increase in the number of collisions
(B) the increase in the number of activated molecules
(C) The shortening of mean free path
(D) the lowering of activation energy
30. The rate constant, the activation energy and the frequency factor of a chemical reaction at 25°C are $3.0 \times 10^{-4} \text{ s}^{-1}$, $104.4 \text{ KJ mol}^{-1}$ and $6.0 \times 10^{14} \text{ s}^{-1}$ respectively. The value of the rate constant as $T \rightarrow \infty$ is :
- (A) $2.0 \times 10^{18} \text{ s}^{-1}$ (B) $6.0 \times 10^{14} \text{ s}^{-1}$
(C) ∞ (D) $3.6 \times 10^{30} \text{ s}^{-1}$
31. According to collision theory of reaction rates –
- (A) Every collision between reactant leads to chemical reaction
(B) Rate of reaction is proportional to velocity of molecules
(C) All reactions which occur in gaseous phase are zero order reaction
(D) Rate of reaction is directly proportional to collision frequency.
32. The activation energy for the forward reaction X Y is 60 KJ mol^{-1} and ΔH is -20 KJ mol^{-1} . The activation energy for the backward reaction Y X is :
- (A) 80 KJ mol^{-1} (B) 40 KJ mol^{-1}
(C) 60 KJ mol^{-1} (D) 20 KJ mol^{-1}

33. For the first order reaction, $X_{(\text{s})} \longrightarrow X_{(\text{g})}$ the monitoring is done by observing the volume :

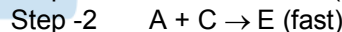
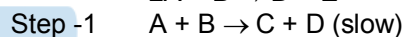
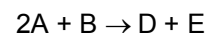
time	t	∞
volume	V_t	V_∞

The rate constant is given by :

- (A) $\frac{1}{t} \ln \left(\frac{V_\infty}{V_t} \right)$
(B) $\frac{1}{t} \ln \left(\frac{V_\infty}{V_\infty - V_t} \right)$
(C) $\frac{1}{t} \ln \left(\frac{V_\infty + V_t}{V_\infty} \right)$
(D) $\frac{1}{t} \ln \left(\frac{V_\infty + V_t}{V_\infty - V_t} \right)$

34. The first order rate constant k is related to temp. as $\log k = 15.0 - (10^6 / T)$ Which of the following pair of value is correct ?
- (A) $A = 10^{15}$ and $E = 1.9 \times 10^4 \text{ KJ}$
(B) $A = 10^{-15}$ and $E = 40 \text{ KJ}$
(C) $A = 10^{15}$ and $E = 40 \text{ KJ}$
(D) $A = 10^{-15}$ and $E = 1.9 \times 10^4 \text{ KJ}$.

35. Following mechanism has been proposed for a reaction.



The rate law expression for the reaction is :

- (A) $r = K[A]^2[B]$ (B) $r = K[A][B]$
(C) $r = K[A]^2$ (D) $r = K[A][C]$

(SECTION-B)

36. A hypothetical reaction $A_2 + B_2 \rightarrow 2AB$ follows the mechanism as given below :
- $A_2 \rightleftharpoons A + A$ fast
 $A + B_2 \rightarrow AB + B$ slow
 $A + B \rightarrow AB$ fast
- The order of the overall reaction is :
- (A) 2 (B) 1 (C) 1.5 (D) 0
37. In the following reaction, how is the rate of appearance of the underlined product related to the rate of disappearance of the underlined reactant ?
- $\text{BrO}_3^- (\text{aq}) + 5\text{Br}^- (\text{aq}) + 6\text{H}^+ (\text{aq}) \rightarrow 3\text{Br}_2(\text{l}) + 3\text{H}_2\text{O}(\text{l})$
- (A) $\frac{d[\text{Br}_2]}{dt} = \frac{5}{3} \frac{d[\text{Br}^-]}{dt}$
(B) $\frac{d[\text{Br}_2]}{dt} = -\frac{d[\text{Br}^-]}{dt}$
(C) $\frac{d[\text{Br}_2]}{dt} = \frac{3}{5} + \frac{d[\text{Br}^-]}{dt}$
(D) $\frac{d[\text{Br}_2]}{dt} = \frac{3}{5} - \frac{d[\text{Br}^-]}{dt}$

38. For the reaction $2\text{N}_2\text{O}_5 \longrightarrow 4\text{NO}_2 + \text{O}_2$, rate and rate constant are 1.02×10^{-4} and $3.4 \times 10^{-5} \text{ s}^{-1}$ respectively, then conc. of N_2O_5 at that time will be
 (A) 1.732 (B) 3
 (C) 1.02×10^{-4} (D) 3.4×10^{-5}
39. The rate constant for a reaction is $10.8 \times 10^{-5} \text{ mol L}^{-1} \text{ S}^{-1}$. The reaction obeys :
 (A) First order (B) Zero order
 (C) Second order (D) All are wrong
40. The rate law for the single step reaction $2\text{A} + \text{B} \rightarrow 2\text{C}$, is given by
 (A) Rate = $K [\text{A}][\text{B}]$
 (B) Rate = $K [\text{A}]^2[\text{B}]$
 (C) Rate = $K [2\text{A}][\text{B}]$
 (D) Rate = $K[\text{A}]^2[\text{B}]^0$
41. In a first order reaction the concentration of the reactant is decreased from 1.0 M to 0.25 M in 20 min. The rate constant of the reaction would be –
 (A) 10 min^{-1} (B) 6.931 min^{-1}
 (C) 0.6931 min^{-1} (D) 0.06931 min^{-1}
42. Catalyst increases the rate of reaction because :
 (A) it decreases ΔH
 (B) it increases ΔH
 (C) it decreases activation energy
 (D) it increases activation energy
43. The rate constant K_1 of a reaction is found to be double that of rate constant K_2 of another reaction. The relationship between corresponding activation energies of the two reactions at same temperature (E_1 and E_2) can be represented as :
 (A) $E_1 > E_2$ (B) $E_1 < E_2$
 (C) $E_1 = E_2$ (D) None of these
44. Half life period of 10 gm radioactive element is 20 days. Then half life period of 100 gm of this element is :
 (A) 20 days (B) 200 days
 (C) 100 days (D) 10 days
45. For the reaction $\text{M} \rightarrow \text{N}$, the rate of disappearance of M increases by a factor of 8 upon doubling the concentration of M . The order of the reaction with respect to M is :
 (A) 4 (B) 3 (C) 2 (D) 1
46. For the reaction, $2\text{A} + \text{B} \rightarrow \text{products}$, when the concentration of A and B both were doubled, the rate of the reaction increased from $0.3 \text{ mol L}^{-1}\text{s}^{-1}$ to $2.4 \text{ mol L}^{-1}\text{s}^{-1}$. When the concentration of A alone is doubled, the rate increased from $0.3 \text{ mol L}^{-1}\text{s}^{-1}$ to $0.6 \text{ mol L}^{-1}\text{s}^{-1}$. Which one of the following statements is correct?
 (A) Order of the reaction with respect to B is 1
 (B) Order of the reaction with respect to B is 2
 (C) Total order of the reaction is 4
 (D) Order of the reaction with respect to A is 2
47. Assertion : Half-life period of a reaction of first order is independent of initial concentration.
 Reason : Half-life period for a first order reaction $t_{1/2} = \frac{2.303}{K} \log 2$.
 (A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
 (B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
 (C) If assertion is true but reason is false.
 (D) If assertion is false but reason is true.
48. Assertion : If in a zero order reaction, the concentration of the reactant is doubled, the half-life period is also doubled.
 Reason : For a zero order reaction, the rate of reaction is independent of initial concentration.
 (A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
 (B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
 (C) If assertion is true but reason is false.
 (D) If assertion is false but reason is true.
49. Assertion : If the activation energy of a reaction is zero, temperature will have no effect on the rate constant.
 Reason : Lower the activation energy, faster is the reaction.
 (A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
 (B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
 (C) If assertion is true but reason is false.
 (D) If assertion is false but reason is true.
50. Assertion : Molecularity has no meaning for a complex reaction.
 Reason : The overall molecularity of a complex reaction is equal to the molecularity of the slowest step.
 (A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
 (B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
 (C) If assertion is true but reason is false.
 (D) If assertion is false but reason is true