DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : CHEMISTRY**
Date : **DPP No. : 2**

Topic :- Chemical Kinetics

1. The velocity constant of a reaction at 290 K was found to be 3.2×10^{-3}at 300 K, it will be
   a) 6.4×10^{-3} b) 1.28×10^{-2} c) 9.6×10^{-3} d) 3.2×10^{-4}

2. The term $\frac{-dc}{dt}$ in a rate equation refers to
   a) The decrease in concentration of the reactant with time
   b) The concentration of the reactant
   c) The change in concentration of the reactant
   d) The velocity constant of the reaction

3. In a first order reaction the concentration of reactant decreases from 800 mol/dm^6 to 50 mol/dm^6in 2×10^4s. The rate constant of reaction in s^{-1} is
   a) 2×10^4 b) 3.45×10^{-5} c) 1.386×10^{-4} d) 2×10^{-4}

4. Consider the chemical reaction,
   $N_2(g) + 3H_2(g) \longrightarrow 2NH_3(g)$
   The rate of this reaction can be expressed in terms of time derivative of concentration of $N_2(g)$, $H_2(g)$ and $NH_3(g)$. Identify the correct relationship amongst the rate expressions:
   a) Rate $= -d[N_2]/dt = -\frac{1}{3}d[H_2]/dt = \frac{1}{2}d[NH_3]/dt$
   b) Rate $= -d[N_2]/dt = -3d[H_2]/dt = 2d[NH_3]/dt$
   c) Rate $= d[N_2]/dt = \frac{1}{3}d[H_2]/dt = \frac{1}{2}d[NH_3]/dt$
   d) Rate $= -d[N_2]/dt = -d[H_2]/dt = d[NH_3]/dt$

5. Rate of reaction can be expressed by following rate expression, rate=$k[A]^2[B]$, if concentration of A is increased by 3 times and concentration of B is increased by 2 times, how many times rate of reaction increases?
   a) 9 times b) 27 times c) 18 times d) 8 times

6. As the reaction progresses, the rate of reaction
   a) Increases b) Decreases
   c) Remains constant d) First increases, then decreases

7. The data for the reaction, A+B→C

Ex	$[A]_0$	$[B]_0$	Initial rate
1	0.012	0.035	0.10
2	0.024	0.070	0.80
3	0.024	0.035	0.10
4	0.012	0.070	0.80

   The rate law corresponds to the above data is
   a) $rate = k[B]^3$ b) $rate = k[B]^4$ c) $rate = k[A][B]^3$ d) $rate = k\,[A]^2[B]^2$

8. In a reaction, when the concentration of reactant is increased two times, the increase in rate of reaction was four times. Order of reaction is
a) Zero b) 1 c) 2 d) 3

9. For the reaction
$N_2 + 3H_2 \rightleftharpoons 2NH_3$
The rate of change of concentration for hydrogen is $0.3 \times 10^{-4} Ms^{-1}$
The rates of change of concentration of ammonia is
a) -0.2×10^{-4} b) 0.2×10^{-4} c) 0.1×10^{-4} d) 0.3×10^{-4}

10. Which of the following statement is in accordance with collision theory?
Rate is directly proportional to collision frequency
Rate depend upon orientation of atoms
Temperature determines the rate
a) Only III b) Only I and II
c) Only II and III d) All of these

11. $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g) + 22$ kcal.
The activation energy for the forward reaction is 50 kcal. What is the activation energy for the backward reaction?
a) -72 kcal b) -28 kcal c) +28 kcal d) +72 kcal

12. According to collision theory:
a) Collisions are sufficiently violent
b) All collision are responsible for reaction
c) All collisions are effective
d) Only highly energetic molecules have enough energy to react

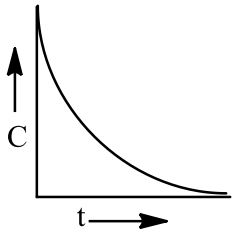
13. The rate constant of a first order reaction whose half-life is 480 s is
a) $1.44\ s^{-1}$ b) $1.44 \times 10^{-3}\ s^{-1}$ c) $2.88 \times 10^{-3}\ s^{-1}$ d) $0.72 \times 10^{-3}\ s^{-1}$

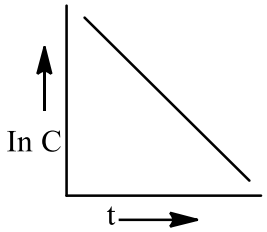
14. $2A \rightarrow B + C$; It would be a zero order reaction when:
a) The rate of reaction is proportional to square of conc. of A
b) The rate of reaction remains same at any conc. of A
c) The rate remains unchanged at any conc. of B and C
d) The rate of reaction doubles if conc. of B is increased to double

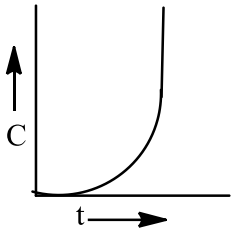
15. For a reaction $A + 2B \longrightarrow C$, rate is given by
$$r = K[A][B]^2$$
The order of reaction is:
a) 3 b) 6 c) 5 d) 7

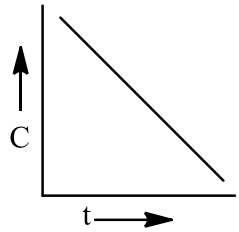
16. Rate constant for a reaction is λ. Average life is represent by
a) $\frac{1}{\lambda}$ b) $\frac{1n^2}{\lambda}$ c) $\frac{\lambda}{\sqrt{2}}$ d) $\frac{0.693}{\lambda}$

17. The plot between concentration versus time for a zero order reaction is represented by

a) 

b) 

c) 

d) 

18. For the decomposition of $N_2O_5(g)$, it is given that:
$2N_2O_5(g) \longrightarrow 4NO_2(g) + O_2(g)$;
Activation energy E_a
$N_2O_5(g) \longrightarrow 2NO_2(g) + (1/2)O_2(g)$;
Activation energy E_a'
then;
a) $E_a = E_a'$ b) $E_a > E_a'$ c) $E_a < E_a'$ d) $E_a = 2E_a'$

19. During the kinetic study of the reaction $2A + B \longrightarrow C + D$ following results were obtained.

Run	$[A]$ in M	$[B]$ in M	Initial rate of formation of D in Ms^{-1}
I	0.1	0.1	6.0×10^{-3}
II	0.3	0.2	7.2×10^{-2}
III	0.3	0.4	2.88×10^{-1}
IV	0.4	0.1	2.40×10^{-2}

On the basis of above data which one is correct:
a) $r = k[A]^2[B]$ b) $r = k[A][B]$ c) $r = k[A^2][B]^2$ d) $r = k[A][B]^2$

20. If the reaction rate at a given temperature becomes slower then
a) The free energy of activation is higher
b) The free energy of activation is lower
c) The entropy changes
d) The initial concentration of the reactants remains constant