DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : CHEMISTRY**
Date : **DPP No. : 5**

Topic :- Chemical Kinetics

1. For zero order reaction, the integrated rate equation is
   a) $kt = \frac{[A]}{[A]_0}$ b) $kt = [A] - [A]_0$ c) $[A] = -kt + [A]_0$ d) $[A] = kt - [A]_0$

2. The half-life period of a first order reaction is 69.3 s. what is the rate constant?
   a) $0.01s^{-1}$ b) $0.1s^{-1}$ c) $1s^{-1}$ d) $10s^{-1}$

3. A reaction has a rate constant of 0.5 mol^{-1} $dm^3 min^{-1}$. If initial concentration of the reactant is 0.2 mol dm^{-3}, half-life of the reaction
   a) 1.4 min b) 10 min c) 15 min d) 20 min

4. The bromination of acetone that occurs in acid solution is represented by this equation.
   $CH_3COCH_3(aq) + Br_2(aq) \rightarrow CH_3COCH_2Br(aq) + H^+(aq) + Br^-(aq)$
   These kinetic data were obtained for given reaction concentrations.

Initial concentrations, M			
$[CH_3COCH_3]$	$[Br_2]$	$[H^+]$	Initial rate, disappearance of Br_2, M s^{-1}
0.30	0.05	0.05	5.7×10^{-5}
0.30	0.10	0.05	5.7×10^{-5}
0.30	0.10	0.10	1.2×10^{-4}
0.40	0.05	0.20	3.1×10^{-4}

   Based on these data, the rate equation is:
   a) rate $= k[CH_3COCH_3][Br_2]$
   b) rate $= k[CH_3COCH_3][Br_2][H^+]^2$
   c) rate $= k[CH_3COCH_3][Br_2][H^+]$
   d) rate $= k[CH_3COCH_3][H^+]$

5. The rate constant for a chemical reaction has units $L\ mol^{-1}s^{-1}$,order of the reaction will be
   a) 0 b) 1 c) 2 d) 3

6. Activation energy of a chemical reaction can be determined by
   a) Evaluating rate constant at standard temperatures
   b) Evaluating velocities of reaction at two different temperatures
   c) Evaluating rate constants at two different temperatures
   d) Changing concentration of reactants

7. Which statement about molecularity of a reaction is wrong?
   a) It is the number of molecules of the reactants taking part in a single step of reaction
   b) It is calculated from the reaction mechanism
   c) It may be either whole number or fractional
   d) None of the above

8. Arrhenius equation may not be represented as
   a) $\ln\frac{A}{k} = \frac{E_a}{RT}$
   b) $\frac{d\ln k}{dT} = \frac{E}{RT^2}$
   c) $\log A = \log k + \frac{E_a}{2.303\,RT}$
   d) $\log\left[-\frac{E_a}{RT}\right] = \frac{k}{A}$

9. The reaction $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$ is carried out in a $1dm^3$vessel and $2dm^3$vessel separately. The ratio of the reaction velocities will be
   a) 1:8 b) 1:4 c) 4:1 d) 8:1

10. The rate for the reaction, $RCl + NaOH(aq) \rightarrow ROH + NaCl$ is given by rate =k[RCl],the freezing point of the reaction is
    a) Unaffected by increasing the temperature of the reaction
    b) Decreased on increasing the temperature of the reaction
    c) Halved on reducing the concentration of RCl to half
    d) Doubled on doubling the concentration of NaOh

11. In the sequence of reaction,
    $A \xrightarrow{k_1} B \xrightarrow{k_2} C \xrightarrow{k_3} D$ $k_3 > k_2 > k_1$ then the rate determining step of reaction is
    a) $A \rightarrow B$ b) $B \rightarrow C$ c) $C \rightarrow D$ d) $A \rightarrow D$

12. A first order reaction is 20% complete in 10 min. What is the rate constant of the reaction?
    a) 0.223 b) 0.0223 c) 0.322 d) 0.0322

13. The activation energy of exothermic reaction $A \rightarrow B$ 80 kJ mol^{-1}. The heat of reaction is 200 kJ mol^{-1} . The activation energy for the reaction $B \rightarrow A$(in kJ mol^{-1}) will be
    a) 80 b) 120 c) 40 d) 280

14. An endothermic reaction $A \rightarrow B$ has an activation energy of 15 kcal/mol and the energy of

reaction is 5 kcal/mol. The activation energy for the reaction $B \rightarrow A$ is

a) 20 kcal/mol b) 15 kcal/mol c) 10 kcal/mol d) Zero

15. K for a zero order reaction is 2×10^{-2} mol $L^{-1}sec^{-1}$. If the concentration of the reactant after 25 sec is 0.5 M, the initial concentration must have been:

a) 0.5 M b) 1.25 M c) 12.5 M d) 1.0 M

16. Rate constant for a reaction is $10^{-3}s^{-1}$. The to leave 25% reaction is

a) 693 s b) 1386 s c) 6930 s d) 2029 s

17. By increase in temperature by 10 K, the rate of reaction becomes double. How many times the rate of reaction will be if the temperature is increased from 303K to 353 K?

a) 4 b) 8 c) 16 d) 32

18. Temperature coefficient of a reaction is 2. When temperature is increased from 30°C to 100°C, rate of the reaction increases by

a) 128 times b) 100 times c) 500 times d) 250 times

19. The activation energy of a reaction is 9 kcal/mol. The increase in the rate constant when its temperature is raised from 295 to 300 K is approximately

a) 10% b) 50% c) 100% d) 28%

20. For a reaction $\frac{1}{2}A \rightarrow 2B$, rate of disappearance of 'A' is related to the rate of appearance of B by the expression

a) $-\frac{d[A]}{dt} = \frac{1}{2}\frac{d[B]}{dt}$ b) $-\frac{d[A]}{dt} = \frac{1}{4}\frac{d[B]}{dt}$ c) $-\frac{d[A]}{dt} = \frac{d[B]}{dt}$ d) $-\frac{d[A]}{dt} = 4\frac{d[B]}{dt}$