



SHIKSHA CLASSES

Subject : Chemistry

BOARD QUESTION PAPER

Total Marks : 20

Class : XII

Topic : 6. Chemical Kinetics

Time : 1 Hr.

Section (A)

Q.1. : Select and write the most appropriate answer from given alternatives in each

sub-question

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- i) The rate constant of reaction
- a) decreases with increasing E_a b) decreases with decreasing E_a
c) is independent of E_a d) decreases with increasing T
- ii) The slope of straight line obtained by plotting rate versus conc. of reactant for a first order reaction is
- a) $-K$ b) $-K/2.303$
c) $K/2.303$ d) K
- iii) The half life of the first order reaction having rate constant $K = 1.7 \times 10^{-5} \text{ s}^{-1}$ is
- a) 12.1 hour b) 9.7 hour
c) 11.1 hour d) 1.8 hour
- iv) The rate constant of zero order reaction has the unit
- a) s^{-1} b) $\text{mol L}^{-1} \text{ s}^{-1}$
c) $\text{L}^2 \text{ mol}^{-2} \text{ s}^{-1}$ d) $\text{L mol}^{-1} \text{ s}^{-1}$
- v) The order of the reaction for which the units of rate constant are $\text{mol dm}^{-3} \text{ s}^{-1}$ is
- a) 1 b) 3 c) 0 d) 2

Q.2 : Very short answer type Question.

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- i) What is molecularity of the reaction ?
ii) What is rate law for a reaction.

$\text{NO}_{2(g)} + \text{CO}_{(g)} \rightarrow \text{NO}_{(g)} + \text{CO}_{2(g)}$ If the reaction occurs in the following steps?

- i) $\text{NO}_2 + \text{NO}_2 \rightarrow \text{NO}_3 + \text{NO}$ (Slow)
ii) $\text{NO}_3 + \text{CO} \rightarrow \text{NO}_2 + \text{CO}_2$ (Fast)

Section (B)

: **Attempt any three of the following.** 6

- Q. 3 : Define rate law. Explain with one example
- Q. 4 : Derive the expression for half life of zero order reaction.
- Q. 5 : Write Arrhenius equation and explain the terms involved.
- Q. 6 : What is zero order reaction? Derive integrated rate law for zero order reaction?

Section (C)

: **Attempt any one from following.** 3

- Q. 7 : In a first order reaction $A \rightarrow B$, 60% of the given sample of compound decomposes in 45 minutes. What is half life of reaction?
- Q. 8 : For the first order reaction $A_{(g)} \rightarrow 2B_{(g)} + C_{(g)}$ the initial pressure of A is 90 mm Hg and pressure after 10 min is found to be 180 mm Hg. Find rate constant of reaction.

Section (D)

: **Attempt any one.** 4

- Q. 9 : i) Derive integrated rate law for first order reaction.
- ii) Consider the reaction $2N_2O_{5(g)} \rightarrow 4NO_{2(g)} + O_{2(g)}$ in liquid bromine. At a particular moment during the reaction N_2O_5 disappears at a rate 0.02 M/s. At what rates NO_2 and O_2 are formed? what is rate of reaction.
- Q. 10 : i) Draw the following graphs
- a) $\log \frac{[A]_0}{[A]_t}$ vs time (t) for first order reaction
- b) $[A]_t$ vs time (t) for zero order reaction.
- c) $\log[A]_t$ vs t for first order
- ii) The rate of the reaction, $A + B \rightarrow P$ is $3.6 \times 10^{-2} \text{ mol dm}^{-3} \text{ s}^{-1}$ where $[A] = 0.2 \text{ moles dm}^{-3}$ and $[B] = 0.1 \text{ moles dm}^{-3}$. Calculate the rate constant if the reaction is first order in A and second order in B.

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