

BOARD-PATTERN PRACTICE PAPER · CBSE CLASS 12

Chemical Kinetics

Chemistry · Chapter 3 · Matches current CBSE blueprint · Each question PYQ-sourced where indicated

DATE _____	TOTAL MARKS 30	DURATION 75 min	MARKING As per board	TARGET ≥ 24/30
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GENERAL INSTRUCTIONS

1. All questions are compulsory.
2. Use of calculator is NOT permitted; log tables are provided.
3. Use $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$ wherever required.
4. Draw labelled diagrams wherever asked.
5. Show all working steps in numerical problems.

Section A — Very Short Answer (1 mark each)
4 MARKS · 8 MIN

- Q1.** Define rate of a chemical reaction. [PYQ 2018 Delhi] **[1 mark]**
- Q2.** Write the units of rate constant for a zero-order reaction. [PYQ 2019 Outside Delhi] **[1 mark]**
- Q3.** What is the value of half-life of a first-order reaction in terms of rate constant? [PYQ 2020 Delhi] **[1 mark]**
- Q4.** State whether molecularity of a reaction can be zero. [PYQ 2018 Outside Delhi] **[1 mark]**

Section B — Short Answer I (2 marks each)
8 MARKS · 20 MIN

- Q5.** Differentiate between order and molecularity of a reaction (any two differences). [PYQ 2018 Delhi] **[2 marks]**
- Q6.** Derive the expression for half-life of a zero-order reaction. [PYQ 2022 Delhi] **[2 marks]**
- Q7.** Draw the energy-profile diagram showing the effect of a catalyst. Label E_a (uncatalysed), E_a (catalysed), and ΔH . [PYQ 2018 Delhi] **[2 marks]**
- Q8.** Define rate constant. State two factors on which it depends. [PYQ 2021 Delhi] **[2 marks]**

Section C — Short Answer II (3 marks each)
12 MARKS · 32 MIN

- Q9.** A first-order reaction has a rate constant $k = 0.0231 \text{ min}^{-1}$. Calculate (i) the half-life and (ii) the time required for 75% completion of the reaction. [PYQ 2019 Delhi] **[3 marks]**
- Q10.** The rate of a reaction quadruples when the temperature changes from 293 K to 313 K. Calculate the activation energy. ($R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$; $\log 4 = 0.6021$) [PYQ 2023 Outside Delhi] **[3 marks]**
- Q11.** What is meant by pseudo-first-order reaction? Give one example and explain. [PYQ 2019 Delhi] **[3 marks]**
- Q12.** Derive the integrated rate equation for a first-order reaction $A \rightarrow \text{product}$, and obtain expressions for (i) the rate constant k and (ii) the half-life $t_{1/2}$. [PYQ 2022 Delhi] **[3 marks]**

Section D — Long Answer (6 marks)
6 MARKS · 15 MIN

- Q13.** (a) Explain the terms 'order' and 'molecularity' of a reaction with one example each. (3 marks) (b) The decomposition of N_2O_5 in CCl_4 follows first-order kinetics. After 30 min from the start, the concentration of N_2O_5 is found to be 0.30 mol/L ; after 60 min, it is 0.15 mol/L . Calculate the rate constant. (3 marks) [PYQ 2020 Delhi] **[6 marks]**

Marking scheme & model answers — see companion Answer Key PDF · all PYQs traceable to actual CBSE papers · [readyforboards.com](https://www.readyforboards.com) · +91 70330 05444