

PYQSide

JEE MAIN CHEMICAL KINETICS — HALF-LIFE OF A REACTION — PYQS

Max. Marks: 28

Questions: 7

Section A (MCQ)

- Q.1** $t_{100\%}$ is the time required for the 100% completion of the reaction while $t_{1/2}$ is the time required for 50% of the reaction to be completed. Which of the following option correctly represents the relation between $t_{100\%}$ and $t_{1/2}$ for zero and first order reactions respectively ?

[JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) $t_{100\%} = (t_{1/2})^2$ and $t_{100\%} = (t_{1/2})^{-\infty}$
 (2) $t_{100\%} = 2t_{1/2}$ and $t_{100\%} = (t_{1/2})^{\infty}$
 (3) $t_{100\%} = 2t_{1/2}$ and $t_{100\%} = (2t_{1/2})^2$
 (4) $t_{100\%} = (t_{1/2})^{\infty}$ and $t_{100\%} = 2t_{1/2}$

Scan or tap for the full solution



- Q.2** In a reaction $A + B \rightarrow C$, initial concentrations of A and B are related as $[A]_0 = 8[B]_0$. The half-lives of A and B are 10 min and 40 min, respectively. If they start to disappear at the same time, both following first order kinetics, after how much time will the concentration of both the reactants be same?

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) 20 min (2) 40 min (3) 80 min (4) 60 min

Scan or tap for the full solution

**Q.3**

$[A]_0/\text{mol L}^{-1}$	$t_{1/2}/\text{min}$
0.100	200
0.025	100

For a given reaction $R \rightarrow P$, $t_{1/2}$ is related to $[A]_0$ as given in table.

Given: $\log 2 = 0.30$

Which of the following is true?

- A. The order of the reaction is $1/2$.
 B. If $[A]_0$ is 1 M, then $t_{1/2}$ is $200\sqrt{10}$ min
 C. The order of the reaction changes to 1 if the concentration of reactant changes from 0.100 M to 0.500 M.
 D. $t_{1/2}$ is 800 min for $[A]_0 = 1.6$ M

Choose the correct answer from the options given below:

[JEE Main 2025 (Online) 28th January Morning Shift]

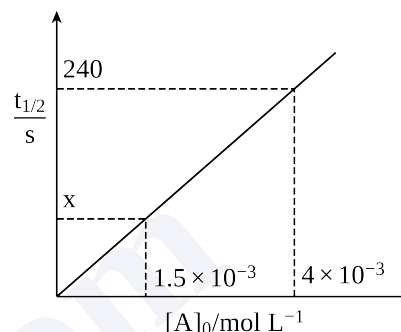
- (1) A and C Only (2) A, B and D Only
 (3) A and B Only (4) C and D Only

Scan or tap for the full solution



Section B (Numerical)

- Q.4** For a reaction $A \rightarrow P$ at T K, the half life ($t_{1/2}$) is plotted as a function of initial concentration $[A]_0$ of A as given below.



The value of x in the given figure is _____ s (Nearest integer)

[JEE Main 2026 (Online) 5th April Evening Shift]

Scan or tap for the full solution



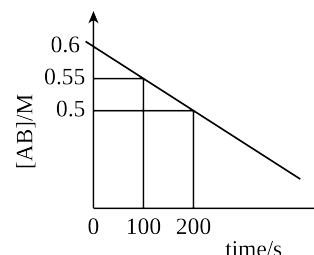
- Q.5** The half-life of ^{65}Zn is 245 days. After x days, 75% of original activity remained. The value of x in days is _____. (Nearest integer)
 (Given: $\log 3 = 0.4771$ and $\log 2 = 0.3010$)

[JEE Main 2026 (Online) 24th January Evening Shift]

Scan or tap for the full solution



- Q.6** For the thermal decomposition of reactant AB(g) , the following plot is constructed.



The half-life of the reaction is 'x' min.

x = _____ min. (Nearest integer)

[JEE Main 2026 (Online) 23rd January Morning Shift]

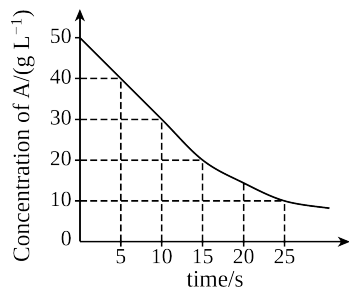
Scan or tap for the full solution



- Q.7** For the reaction $A \longrightarrow B$ the following graph was obtained. The time required (in seconds) for the concentration of A to reduce to 2.5 g L^{-1} (if the initial concentration of A was 50 g L^{-1}) is _____.
(Nearest integer)

Given : $\log 2 = 0.3010$

[JEE Main 2025 (Online) 2nd April Evening Shift]



Scan or tap for the
full solution



ANSWER KEY

Section A (MCQ)

Ques.	1	2	3									
Ans.	2	2	2									

Section B (Numerical)

Ques.	4	5	6	7			
Ans.	90	102	10	43			