

# PYQSide

## NEET CHEMICAL KINETICS — RATE LAW EXPRESSION, ORDER AND MOLECULARITY OF A REACTION — PYQS

Max. Marks: 60

Questions: 15

### Section A (MCQ)

**Q.1** Match List-I with List-II : [NEET (UG) 2026]

| List-I<br>(Order of reaction) |              | List-II<br>(Unit of rate constant) |                                            |
|-------------------------------|--------------|------------------------------------|--------------------------------------------|
| A.                            | Zero order   | I.                                 | $\text{mol}^{-1} \text{L s}^{-1}$          |
| B.                            | First order  | II.                                | $\text{mol}^{-2} \text{L}^2 \text{s}^{-1}$ |
| C.                            | Second order | III.                               | $\text{s}^{-1}$                            |
| D.                            | Third order  | IV.                                | $\text{mol L}^{-1} \text{s}^{-1}$          |

- (1) A-IV, B-III, C-II, D-I (2) A-IV, B-III, C-I, D-II  
(3) A-I, B-II, C-III, D-IV (4) A-IV, B-II, C-I, D-III

Scan or tap for the full solution 

**Q.2** Following data is for a reaction between reactants A and B :

| Rate ( $\text{mol L}^{-1} \text{s}^{-1}$ ) | [A]   | [B]   |
|--------------------------------------------|-------|-------|
| $2 \times 10^{-3}$                         | 0.1 M | 0.1 M |
| $4 \times 10^{-3}$                         | 0.2 M | 0.1 M |
| $1.6 \times 10^{-2}$                       | 0.2 M | 0.2 M |

The order of the reaction with respect to A and B, respectively, are [RE-NEET (UG) 2024]

- (1) 1, 0 (2) 0, 1 (3) 1, 2 (4) 2, 1

Scan or tap for the full solution 

**Q.3** For a certain reaction, the rate =  $k[A]^2[B]$ , when the initial concentration of A is tripled keeping concentration of B constant, the initial rate would [NEET (UG) 2023]

- (1) increase by a factor of six  
(2) increase by a factor of nine  
(3) increase by a factor of three  
(4) decrease by a factor of nine

Scan or tap for the full solution 

**Q.4** The decomposition of phosphine ( $\text{PH}_3$ ) on tungsten at low pressure is a first-order reaction. It is because the [NEET 2016 (Phase 2)]

- (1) rate is proportional to the surface coverage  
(2) rate is inversely proportional to the surface coverage  
(3) rate is independent of the surface coverage  
(4) rate of decomposition is very slow.

Scan or tap for the full solution 

**Q.5** For a reaction between A and B the order with respect to A is 2 and the order with respect to B is 3. The concentrations of both A and B are doubled, the rate will increase by a factor of

[NEET 2013 (Karnataka)]

- (1) 12 (2) 16 (3) 32 (4) 10

Scan or tap for the full solution 

**Q.6** In a reaction,  $A + B \rightarrow \text{product}$ , rate is doubled when the concentration of B is doubled, and rate increases by a factor of 8 when the concentrations of both the reactants (A and B) are doubled, rate law for the reaction can be written as

[AIPMT 2012 (Prelims)]

- (1) rate =  $k[A][B]^2$  (2) rate =  $k[A]^2[B]^2$   
(3) rate =  $k[A][B]$  (4) rate =  $k[A]^2[B]$

Scan or tap for the full solution 

**Q.7** The unit of rate constant for a zero order reaction is

[AIPMT 2011 (Mains)]

- (1)  $\text{mol L}^{-1} \text{s}^{-1}$  (2)  $\text{L mol}^{-1} \text{s}^{-1}$   
(3)  $\text{L}^2 \text{mol}^{-2} \text{s}^{-1}$  (4)  $\text{s}^{-1}$

Scan or tap for the full solution 

**Q.8** Which one of the following statements for the order of a reaction is incorrect? [AIPMT 2011 (Prelims)]

- (1) Order can be determined only experimentally.  
(2) Order is not influenced by stoichiometric coefficient of the reactants.  
(3) Order of a reaction is sum of power to the concentration terms of reactants to express the rate of reaction.  
(4) Order of reaction is always whole number.

Scan or tap for the full solution 

- Q.9** During the kinetic study of the reaction,  $2A + B \longrightarrow C + D$ , following results were obtained

| Run  | [A]/mol L <sup>-1</sup> | [B]/mol L <sup>-1</sup> | Initial rate of formation of D/mol L <sup>-1</sup> min <sup>-1</sup> |
|------|-------------------------|-------------------------|----------------------------------------------------------------------|
| I.   | 0.1                     | 0.1                     | $6.0 \times 10^{-3}$                                                 |
| II.  | 0.3                     | 0.2                     | $7.2 \times 10^{-2}$                                                 |
| III. | 0.3                     | 0.4                     | $2.88 \times 10^{-1}$                                                |
| IV.  | 0.4                     | 0.1                     | $2.40 \times 10^{-2}$                                                |

Based on the above data which one of the following is correct? [AIPMT 2010 (Prelims)]

- (1) Rate =  $k[A]^2[B]$  (2) Rate =  $k[A][B]$   
 (3) Rate =  $k[A]^2[B]^2$  (4) Rate =  $k[A][B]^2$

Scan or tap for the full solution 

- Q.10** For the reaction  $A + B \longrightarrow$  products, it is observed that

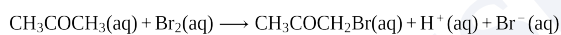
- (i) on doubling the initial concentration of A only, the rate of reaction is also doubled and  
 (ii) on doubling the initial concentration of both A and B, there is a change by a factor of 8 in the rate of the reaction.

The rate of this reaction is given by [AIPMT 2009]

- (1) rate =  $k[A]^2[B]^2$  (2) rate =  $k[A][B]^2$   
 (3) rate =  $k[A][B]$  (4) rate =  $k[A]^2[B]$

Scan or tap for the full solution 

- Q.11** The bromination of acetone that occurs in acid solution is represented by this equation.



These kinetic data were obtained for given reaction concentrations.

| [CH <sub>3</sub> COCH <sub>3</sub> ], M | [Br <sub>2</sub> ], M | [H <sup>+</sup> ], M | Initial rate, disappearance of Br <sub>2</sub> , M s <sup>-1</sup> |
|-----------------------------------------|-----------------------|----------------------|--------------------------------------------------------------------|
| 0.30                                    | 0.05                  | 0.05                 | $5.7 \times 10^{-5}$                                               |
| 0.30                                    | 0.10                  | 0.05                 | $5.7 \times 10^{-5}$                                               |
| 0.30                                    | 0.10                  | 0.10                 | $1.2 \times 10^{-4}$                                               |
| 0.40                                    | 0.05                  | 0.20                 | $3.1 \times 10^{-4}$                                               |

Based on these data, the rate equation is

[AIPMT 2008]

- (1) Rate =  $k[\text{CH}_3\text{COCH}_3][\text{Br}_2][\text{H}^+]^2$   
 (2) Rate =  $k[\text{CH}_3\text{COCH}_3][\text{Br}_2][\text{H}^+]$   
 (3) Rate =  $k[\text{CH}_3\text{COCH}_3][\text{H}^+]$   
 (4) Rate =  $k[\text{CH}_3\text{COCH}_3][\text{Br}_2]$

Scan or tap for the full solution 

- Q.12** The rate of reaction between two reactants A and B decreases by a factor of 4 if the concentration of reactant B is doubled. The order of this reaction with respect to reactant B is [AIPMT 2005]

- (1) 2 (2) -2 (3) 1 (4) -1

Scan or tap for the full solution 

- Q.13** If the rate of the reaction is equal to the rate constant, the order of the reaction is [AIPMT 2003]

- (1) 0 (2) 1 (3) 2 (4) 3

Scan or tap for the full solution 

- Q.14**  $2A \longrightarrow B + C$

It would be a zero order reaction when

[AIPMT 2002]

- (1) the rate of reaction is proportional to square of concentration of A  
 (2) the rate of reaction remains same at any concentration of A  
 (3) the rate remains unchanged at any concentration of B and C  
 (4) the rate of reaction doubles if concentration of B is increased to double

Scan or tap for the full solution 

- Q.15** For the reaction;  
 $2\text{N}_2\text{O}_5 \longrightarrow 4\text{NO}_2 + \text{O}_2$  rate and rate constant are  $1.02 \times 10^{-4}$  and  $3.4 \times 10^{-5} \text{ s}^{-1}$  respectively, then concentration of  $\text{N}_2\text{O}_5$  at that time will be [AIPMT 2001]

- (1) 1.732 (2) 3  
 (3)  $1.02 \times 10^{-4}$  (4)  $3.4 \times 10^5$

Scan or tap for the full solution 

### ANSWER KEY

| Ques. | 1  | 2  | 3  | 4  | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-------|----|----|----|----|---|---|---|---|---|----|----|
| Ans.  | 2  | 3  | 2  | 1  | 3 | 4 | 1 | 4 | 4 | 2  | 3  |
| Ques. | 12 | 13 | 14 | 15 |   |   |   |   |   |    |    |
| Ans.  | 2  | 1  | 2  | 2  |   |   |   |   |   |    |    |