

NAME:		ROLL NO:		TIME:	30: MIN
SUB:	Chemistry	Date:		CLASS:	1 st Year
SYLLABUS	Chp. 7 (Reaction Kinetics)	T. MARKS	28	OBT. M	

Q. 1 Choose the Correct Answer. Cutting, Erasing, Double Selection is Strictly Prohibited. (1x28=28)

1. The rate of reaction:

- (A) Increases as the reaction proceeds
- (B) Decreases as the reaction proceeds
- (C) Remains the same as the reaction proceeds
- (D) May decrease or increase as the reaction proceeds

2. Increasing the temperature of a chemical reaction increases the rate of reaction because:

- (A) Both the collision frequency and collision energies of reactant molecules increase
- (B) Collision frequency of reactant molecules increases
- (C) Activation energy increase
- (D) Activation energy decrease

3. Consider two reactions with different activation energies at the same temperature. The reaction with the lower activation energy will have:

- (A) A smaller rate constant
- (B) A larger rate constant
- (C) The same rate constant
- (D) A rate constant that depends on the enthalpy change

4. The order of the chemical reaction, that is independent of concentration is:

- (A) Second order reaction
- (B) First order reaction
- (C) Zero order reaction
- (D) Pseudo first order reaction

5. On a Boltzmann distribution curve, the area under the curve represents:

- (A) Activation energy of the reaction
- (B) Total number of molecules in the sample
- (C) Average kinetic energy of the molecules
- (D) Rate constant of the reaction

6. On a Boltzmann distribution curve, the activation energy (E_a) is represent by:

- (A) The height of the peak
- (B) The area under the entire curve
- (C) A vertical line drawn at a specific kinetic energy value
- (D) The difference between the peak and the X-axis

7. If we double the concentration of a reactant, the rate increases by four times, the reaction is:

- (A) Second order
- (B) First order
- (C) Third order
- (D) Zero order

8. The rate determining step in a multi-step reaction is:

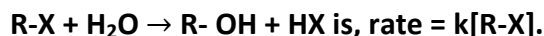
- (A) Always the first step
- (B) Always the last step
- (C) The slowest step
- (D) The fastest step

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9. The reaction $\text{NO}_2 + \text{CO} \rightarrow \text{NO} + \text{CO}_2$ occurs in two steps. What is the rate law equation for this reaction? $2\text{NO}_2 \rightarrow \text{NO} + \text{NO}_3$ (k_1) slow $\text{NO}_3 + \text{CO} \rightarrow \text{CO}_2 + \text{NO}_2$ (k_2) fast
- (A) $R = k_1[\text{NO}_2]^3$ (B) $R = k_2[\text{NO}_3][\text{CO}]$
 (C) $R = k_1[\text{NO}_2]$ (D) $R = k_1[\text{NO}_2]^2$
10. How does the presence of a catalyst affect the rate of a chemical reaction?
- (A) It always decreases the rate of the reaction.
 (B) It always increases the rate of the reaction.
 (C) It increases the rate of the forward and decreases the rate of the reverse reaction.
 (D) It increases the rate of both the forward and reverse reactions.
11. On an energy profile diagram, the presence of a catalyst is represented by:
- (A) A higher peak representing the activation energy.
 (B) A lower peak representing the activation energy.
 (C) A change in the energy level of the reactants or products.
 (D) A shift in the equilibrium position.
12. The units of the rate constant (k) for a reaction depend on the:
- (A) Activation energy of the reaction
 (B) Temperature of the reaction
 (C) Overall order of the reaction
 (D) Stoichiometry of the balanced chemical equation
13. A first-order reaction has a half-life ($t_{1/2}$) of 20 minutes. What is the value of its rate constant (k)?
- (A) 0.05 min^{-1} (B) 0.693 min^{-1} (C) 0.0347 min^{-1} (D) 13.86 min^{-1}
14. The rate of a reaction _____ as the reaction proceeds.
- (A) Increases (B) Decreases
 (C) Remains the same (D) May increase or decrease
15. The unit of the rate constant is the same as that of the rate of reaction in _____ order reaction.
- (A) First (B) Second (C) Third (D) Zero
16. For the reaction: $2\text{A} + \text{B} \xrightarrow{\text{slow}} \text{C}$, the rate law for the reaction is
- (A) $\text{rate} = k[\text{A}]^2 [\text{B}]$ (B) $\text{rate} = k[\text{A}] [\text{B}]$ (C) $\text{rate} = k[\text{C}]$ (D) None of these
17. For the reaction: $2\text{A} + \text{B} \rightarrow \text{C} + \text{D}$
 The expression for the rate law is, $\text{rate} = k[\text{A}]^2$, the order of reaction in B is
- (A) First (B) Second (C) Third (D) Zero
18. The activation energy for a reaction can be:
- (A) Increased by increasing temperature
 (B) Increased by decreasing temperature
 (C) Decreased by increasing concentration of reactants
 (D) None of these

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19. Rate law for the reaction



The rate of reaction will be doubled when

- (A) Concentration of H_2O is doubled
- (B) Concentration of $R-X$ is reduced to half
- (C) Concentration of both $R-X$ and H_2O is doubled
- (D) None of these

20. The rate of a catalyzed reaction is independent of the concentration of

- (A) Reactants
- (B) Products
- (C) Catalyst
- (D) Zero

21. If a reaction proceeds in such a way that order of reaction is independent of the reactants concentration, the overall order of reaction would be

- (A) First
- (B) Second
- (C) Third
- (D) Zero

22. Reactions with high activation energy are usually

- (A) Fast
- (B) Slow
- (C) Exothermic
- (D) Reversible

23. In a reversible reaction, catalyst lower the activation energy of the

- (A) Forward reaction
- (B) Reverse reaction
- (C) Forward reaction as well as reverse reaction
- (D) Forward reaction but increase for the reverse reaction

24. If rate of reaction doubles for every 10°C rise in temperature what is the increase in rate of reaction if temperature rises from 10°C to 100°C

- (A) 112 times
- (B) 100 times
- (C) 400 times
- (D) 512 times

25. Order of reaction is the number of reacting molecules whose concentration alters as a result of chemical change for which order of reaction the unit of rate constant (k) is the same as that of rate of reaction?

- (A) 1st order reaction
- (B) 2nd order reaction
- (C) Zero order reaction
- (D) 3rd order reaction

26. The hydrolysis of $(CH_3)_3 CBr$ by OH^- ion proceed in two steps:



which of the following rate equation is consistent with this scheme?

- (A) rate = $k[RBr]^2$
- (B) rate = $k[RBr][OH^-]$
- (C) rate = $k[RBr][OH^-]^2$
- (D) rate = $k[RBr]$

27. Which one of the following correctly represents the units of the rate constant k for a first order reaction?

- (A) s^{-1}
- (B) $\text{mol dm}^{-3}\text{s}$
- (C) $\text{mol dm}^{-3}\text{s}^{-1}$
- (D) $\text{mol}^{-1} \text{dm}^3\text{s}$

28. If the rate of decay of a radioactive isotope decreases from 200 counts per minutes to 25 counter per minute after 24 hours. What is half life?

- (A) 3 hours
- (B) 4 hours
- (C) 6 hours
- (D) 8 hours



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Answer Key

1	B	2	A	3	B	4	C
5	B	6	C	7	A	8	C
9	D	10	D	11	B	12	C
13	C	14	B	15	D	16	A
17	D	18	B	19	D	20	B
21	D	22	B	23	C	24	D
25	C	26	D	27	A	28	D