

Choose the correct answer of the following

1. Reaction rates can change with
a) Temperature b) Addition of catalyst c) Reaction concentration **d) All of these**
2. For first order reactions the rate constant k has the unit
a) Lit mol⁻¹ **b) time⁻¹** c) mol⁻¹ time⁻¹ d) mol time Lit⁻¹
3. Reaction rates are generally
a) are constant throughout a reaction b) are smallest at the beginning & increase with time
c) are greatest at the beginning & decrease with time **d) No such generalization can made**
4. The reaction $A \rightarrow B$ is a second order reaction. When the conc. of A is 0.50 M, the half life is 8 minute. What is the half life if initial conc. of A is 0.10 M ?
a) 80 min b) 8 min **c) 40 min** d) 4 min
5. As the temperature of a reaction is increased, the rate of reaction increases because the
a) reactant molecules collide with greater energy b) reactant molecules collide less frequently
c) reactant molecules collide less frequently with greater energy **d) activation energy is lowered**
6. If the reaction $2A + 3D \rightarrow \text{Product}$, is first order in A & second order in D, then rate law will have rate =
a) **k [A] [D]²** b) k [A]² [D] c) k [A]² [D]² d) k [A] [D]
7. for a certain reaction, a plot of log [A] verses t gives a straight line with slope of -1.46 sec^{-1} . The order of reaction is
a) 0 **b) 1** c) 2 d) 3
8. The thermal decomposition of N_2O_5 to form NO_2 & O_2 is a first order reaction. The rate constant for reaction is $5.1 \times 10^{-4} \text{ sec}^{-1}$ at 318 K. what is half life of this process
a) $3.9 \times 10^3 \text{ sec}$ b) $2.35 \times 10^3 \text{ sec}$ c) $1.0 \times 10^3 \text{ sec}$ **d) $1.35 \times 10^3 \text{ sec}$**
9. Which of the following does not affect the rate of a chemical reaction ?
a) Enthalpy of a reaction b) concentration of reactants c) temperature d) pressure
10. Rate law relates the rate of chemical reaction to
a) temperature b) activation energy **c) concentration of reactants** d) reaction mechanism
11. Rate laws for chemical reactions are determined
a) by examining the coefficients in the balanced chemical equation
b) from the equilibrium constant
c) From the rates of forward and reverse reaction of the system
d) by experiment
12. Rate constant of first order reaction is given by
a) $K = \frac{2.303}{t} \log \frac{a-x}{a}$ **b) $K = \frac{2.303}{t} \log \frac{a}{a-x}$** c) $K = \frac{t}{2.303} \log \frac{a}{a-x}$ d) $K = \frac{2.303}{at} \log \frac{a}{a-x}$
13. Rate constant of zero order reaction is given by
a) $K = xt$ b) $K = \frac{x^2}{t}$ **c) $K = \frac{x}{t}$** d) $K = \frac{a}{xt}$
14. Arrhenius equation is given by

a) $K = AT e^{-Ea/RT}$ b) $K = A e^{-EaT/R}$ c) $K = A e^{-RT/Ea}$ **d) $K = A e^{-Ea/RT}$**

15. Rate constant of second order reaction is given by

a) $K = \frac{2.303}{t} \frac{x}{a-x}$ b) $K = \frac{1}{t} \frac{x}{a-x}$ **c) $K = \frac{1}{t} \frac{x}{a(a-x)}$** d) $K = \frac{1}{t} \frac{a(a-x)}{x}$

16. Unit of zero order reaction is given by

a) mol Lit⁻¹ sec⁻¹ b) mol Lit sec⁻¹ c) mol⁻¹ Lit⁻¹ sec⁻¹ d) None of these

17. Half life of second order reaction is given by

a) $t_{1/2} = \frac{K}{a}$ b) $t_{1/2} = \frac{a}{K}$ **c) $t_{1/2} = \frac{1}{Ka}$** d) None of these

18. Powers in the rate law are determined by

- a) the principle of detailed balance b) physical states of reactants & products
c) Experiment d) coefficients in balanced chemical reaction

19. The half life of a first order reaction process is

- a) depends on the reactant concentration b) directly proportional to the concentration
c) inversely proportional to the concentration **d) independent of reactant concentration**

20. As temperature increases, the reaction rate

- a) decreases b) decreases then increases **c) increases** d) remains the same

21. Reaction $2 \text{NO}_g \rightarrow \text{N}_2 + \text{O}_2$ proceeds in a single elementary step. This reaction is

- a) unimolecular **b) bimolecular** c) termolecular d) None of these

22. Why is minimum energy needed for an effective collision ?

- a) to break the bonds** b) orient the particles correctly
c) particles collides many times d) to give off heat in a reaction

23. According to chemical kinetic, a reaction can occur

- a) if the reactants collide with proper orientation b) if the reactants possess sufficient energy of collision
c) if the reactants are able to form a correct transition state **d) All of these**

24. What happens when molecules collide with less than the activation energy needed for the reaction ?

- a) they stick together but do not react
b) they react, but more slowly
c) they react if the bonds are arranged in the correct orientation
d) they do not react, they simply bounce of each other

25. Reaction $2 \text{NO} + \text{O}_2 \rightarrow 2 \text{NO}_2$ is

- a) unimolecular b) bimolecular **c) termolecular** d) None of these

26. The conduction of electricity occurs by direct flow of electrons is known as

- a) Ionic conductors **b) Electronic conductors** c) Electrolytic conductors d) None of these

27. The specific conductance is specific resistance

- a) equal to b) directly proportional to **c) reciprocal of** d) None of these

28. On dilution specific conductivity

- a) decreases** b) increases c) remains same d) None of these

29. The unit of equivalent conductance is

- a) Ohm⁻¹ cm¹ equt⁻¹ b) Ohm⁻¹ cm⁻² equt⁻¹ c) Ohm⁻¹ cm⁻¹ equt⁻¹ **d) Ohm⁻¹ cm² equt⁻¹**

30. The equivalent conductance with increase in temperature.
 a) decreases **b) increases** c) remains same d) None of these
31. The molar conductance is given by
 a) $\mu = \frac{100 K}{M}$ b) $\mu = \frac{K}{100 M}$ c) $\mu = \frac{K}{1000 M}$ **d) $\mu = \frac{1000 K}{M}$**
32. Cell constant is equal to
 a) $\frac{\text{length}}{\text{Area}}$ b) length X Area c) $\frac{\text{Area}}{\text{length}}$ d) Length + Area
33. What is the cell constant of the cell, if the distance between two electrode is 6.0 cm and area of electrode is 5.0 cm²?
 a) 1.2 cm b) 12 cm **c) 1.2 cm⁻¹** d) 12 cm⁻¹
34. Kohlrausch's law can be expressed as
 a) $\lambda_{\infty} = \lambda_a - \lambda_c$ **b) $\lambda_{\infty} = \lambda_a + \lambda_c$** c) $\lambda_{\infty} = \lambda_c - \lambda_a$ d) $\lambda_{\infty} = \lambda_a \times \lambda_c$
35. The transport number of the anion is given by
 a) $t_a = \frac{V_a}{V_a + V_c}$ b) $t_a = \frac{V_a}{V_a - V_c}$ c) $t_a = \frac{V_c}{V_a + V_c}$ d) $t_a = \frac{V_c}{V_a - V_c}$
36. A strong electrolyte is a substance which dissociates
 a) poorly **b) completely** c) both a & b d) None of these
37. The transport number of the K⁺ is 0.492 in KCl solution, the transport number of Cl⁻ is
 a) 0.492 b) 0.502 c) 0.580 **d) 0.508**
38. The ionic product of water is
 a) 1×10^{-7} b) 1×10^7 **c) 1×10^{-14}** d) 1×10^{14}
39. When a strong acid is titrated against a strong base the end point is the point of
 a) maximum conductance **b) minimum conductance** c) zero conductance d) None of these
40. The wavelength of ultraviolet & visible light of electromagnetic spectrum lies betⁿ.....
 a) 1000 – 2000 Å b) more than 8000 Å⁰ **c) 2000 – 8000 Å⁰** d) None of these
41. stops as soon as the incident radiation is cut off.
 a) **Fluorescence** b) Phosphorescence c) chemiluminescence d) None of these
42. The electronic spins are expressed in terms of spin multiplicity which is given by
 a) S + 2 b) 2S + 2 **c) 2S + 1** d) 2S – 1
43. The quantum efficiency of the reaction H₂ + Cl₂ → 2HCl is
 a) 10 to 10² b) 10⁻² to 10² c) 10² to 10⁴ **d) 10⁴ to 10⁶**
44. Lambert-Beer law is given by the equation
 a) $\log \frac{I}{I_0} = -\epsilon C x$ b) $\log \frac{I}{I_0} = \epsilon C x$ c) $\log \frac{I}{I_0} = -\epsilon C$ d) $\log \frac{I}{I_0} = -b x$
45. In a photochemical reaction 75 molecules are reacted to give products by absorption of 25 photons of suitable radiation. The quantum yield is
 a) 2 **b) 3** c) 25 d) 1
46. Reaction rates can change with
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- a) mol Lit⁻¹ sec⁻¹** b) mol Lit sec⁻¹ c) mol⁻¹ Lit⁻¹ sec⁻¹ d) None of these

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c) 25

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