CHEMISTRY

BOOKS - MARVEL CHEMISTRY (HINGLISH)

CHEMICAL KINETICS

Mcqs

1. The branch of chemistry which deals with the reaction rates and reaction mechanism is called

A. Thermochemistry

B. Photochemistry

C. Analytical chemistry

D. Chemical Kinetics

Answer: D

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2. Which of the following theory is not related to the chemical kinetics?

A. Collision theory

B. Activated complex theoruy

C. Absolute reaction rate theory

D. VSERP theory

Answer: D

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3. Under a given set of experimental condition, with increase in the concentration of the reactants, the rate of a chemical reaction :

A. decreases

B. increases

C. remains unaltered

D. first decreases and then increases

Answer: B

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4. In the elementary reaction $A + B \rightarrow AB$, if the concentration A and B is doubled , the rate of reaction will

A. Be doubled

B. Be halved

C. Increase bu 6 times

D. Incrase by 4

Answer: D

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5. During the course of a chemical reaction the rate of reaction

A. cannot be predicted

B. decreases as the reaction proceeds

C. Increase as the proceeds

D. remains constant throughout the reaction

Answer: B

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6. Rate of a reaction

A. increases with increases in temperature

B. decreases with increases in temperature

C. does not depend on temperature

D. Does not depend on concentration

Answer: A

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7. For a chemical reaction $A + 2B \rightarrow C$ if the rate of disappearance of A is 0 .5 mol dm^{-3} per hour , the rate of disappearance of B is

A. $0.25 mol dm^{-3} hr^{-1}$

B. $0.5 mol dm^{-3} hr^{-1}$

C. $1 mol dm^{-3} hr^{-1}$

D. $2 mol dm^3 hr^{-1}$

Answer: C

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8. A catalyst can

A. shift the equilibrium of a reaction

B. diminish the enthalpy of a reaction

C. diminish the activation energy of a reaction

D. increases the rate constant of the forward reaction without changing that of the reverse reaction

Answer: C

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9. The rate of a chemical reaction depends on

A. Atomic Mass

B. Equivalent Mass

C. Molecular Mass

D. Active Mass

Answer: D

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10. In the reaction $2A + B \rightarrow A_2B$ the rate of consumption of reactant A is

A. Half of the consumption rate of B

B. Equal to the consumption rate of B

C. Twice to the consumption rate B

D. equal to the rate of formation of A_2 B

Answer: C

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11. For the reaction $2SO_3 \rightarrow 2SO_2 + O_2$ rate is expressed as

A. $-\frac{1}{2}\frac{d[SO_3]}{dt} = -\frac{1}{2}\frac{d[SO_2]}{dt} = \frac{d[O_2]}{dt}$

B. $-\frac{2d[SO_3]}{dt} = \frac{2d[SO_2]}{dt} = \frac{d[O_2]}{dt}$

C. $-\frac{1}{2}\frac{d[SO_3]}{dt} = \frac{1}{2}\frac{d[SO_2]}{dt} = \frac{d[O_2]}{dt}$

D. $\frac{-d[SO_3]}{dt} = \frac{d[SO_2]}{dt} = \frac{2d[O_2]}{dt}$

Answer: C

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12. On increasing the temperature by 10K, the rate of reaction becomes double. Which of the following is the most appropriate reason?

A. Collision frequency increases

B. activation energy decreases by increases in termperature

C. The fraction of molecules having energy equal to threshold enregy or more increase

D. the value of threshold energy decreases

Answer: C

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13. For $2NO + O_2 \rightarrow 2NO_2$ change if the volume of the reaction vessel is doubled , the rate of the reaction

A. Will diminsh to 1/4 of initial value

B. Will diminsh to 1/8 of initial value

C. Will grow 4 times

D. will grow 8 times

Answer: B

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14. For the reaction $2N_2O_5 \rightarrow 4NO_2 + O_2$ rate and rate constant are 1.22×10^{-4} and $3.4 \times 10^{-5} S^{-1}$ respectively then the concentration of N_2O_5 at that time will be

A. 1.732

B. 3.5

C. 1.02×10^{-4}

D. 3.4×10^{5}

Answer: B

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15. A foreign substance that increases the speed of a chemical reacting is called

A. Inhibitor

B. Promoter

C. Moderator

D. Catalyst

Answer: D

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16. Which of the following does not affect the rate of reaction?

A. amount of the reactants taken

B. physical state of the reactants

C. $\Delta H$of reaction

D. Size of the vessel

Answer: C

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17. Oxalic acid is oxidised by a acidified $KMnO_4$ as follows:

$$2MnO_4^- + 16H^+ + 5C_2O_4^{2-} \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$$

The rate of this reaction increases with time because

A. CO_2 formed escapes

B. of presence of sulphuric acid $\left[H^+\right]$

C. Of formation of Mn^{2+} which acts an anto catalyst

D. $KMnO_4$ is a strong oxidizing agent

Answer: C

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18. The Activation energy for a chemical reaction mainly depends upon

A. temperature

B. nature of reacting species

C. collision frequency

D. concentration of reactants

Answer: B

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19. Energy of activation of an exothermic reaction reaction is _____.

A. zero

B. negative

C. positive

D. can't be predicted

Answer: C

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20. In many reaction the reaction proceeds in a sequence of steps so the over all rate is determined by

A. order of different steps

B. slowest step

C. molecular step

D. Fastest step

Answer: B

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21. Which of the following rate expression does not represent the rate of the reaction ?

$$2N_2O_{5(g)} \rightarrow 4NO_{2(g)} + O_{2(g)}$$

A. $-\frac{1}{2}\frac{d[N_2O_5]}{dt}$

B. $\frac{1}{2}\frac{d[N_2O_5]}{dt}$

C. $\frac{[O_2]}{dt}$

D. $\frac{1}{4}\frac{d[NO_2]}{dt}$

Answer: B

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22. The effect of catalyst in a chemical reaction is to lower the

A. Heat of reaction

B. equilibrium concentration

C. activation energy

D. concentration of reactants

Answer: D

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23. A biological Catalyst is

A. An amino acid

B. a carbohydrate

C. A nitrogen molecule

D. an enzyme

Answer: D

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24. A catalyst

A. Increases the average kinetic energy of reacting molecule

B. Increases the activation energy

C. Alters the reaction mechanism

D. increases the frequency of collision of reacting species

Answer: C

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25. The rate of chemical reaction is directly proportional to

A. Active Masses of reactand

B. Equilibrium constant

C. Active masses of product

D. Pressure

Answer: A

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26. $2A + B \rightarrow 3C$ for the reaction instant rate of reaction is `

A. $+\frac{1}{2}\frac{d[A]}{dt} = +\frac{d[B]}{dt} = +\frac{1}{3}\frac{d[C]}{dt}$

B. $-\frac{1}{2}\frac{d[A]}{dt} = -\frac{d[B]}{dt} = +\frac{1}{3}\frac{d[C]}{dt}$

C. $+2\frac{d[A]}{dt} = +\frac{d[B]}{dt} = +\frac{1}{3}\frac{d[C]}{dt}$

D. $-2\frac{d[A]}{dt} = -\frac{d[B]}{dt} = +3\frac{d[C]}{dt}$

Answer: B

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27. For the reaction of $4A + B \rightarrow 2C + D$. . Which of the following statements is correct ?

A. The rate of formation of C and D are equal

B. The rate of formation of D is one half the rate of consumption of A

C. The rate of appearance of C is one half the rate of disappearance of B

D. The rate of disappearance of B is one fourth of the rate of disappearance of A

Answer: D

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28. Number of moles of a substance present in one litre volume is known as

A. Activity

B. Molar concentration

C. Mole fraction

D. Molality

Answer: B

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29. Minimum energy required for molecules to react is called :

A. Potential energy

B. concentration of product

C. time

D. activation energy

Answer: D

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30. For the following chemical reaction $2x + y \Leftrightarrow Z$ the expression of equilibrium constant will be

A. $K_c = \frac{[x]^2[Y]}{Z}$

B. $k_c = \frac{[x][y]^2}{[Z]}$

C. $k_c = \frac{[Z]}{[x]^2[Y]}$

D. $K_c = \frac{[Z]}{[X][Y]^2}$

Answer: C

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31. The unit for the rate constant for the second order reaction [Concentration : Mol litre^{-1} time : s] are

A. $Mol^{-1}\text{litre}^{-1}$

B. $Mol\text{litre}^{-2}s^{-1}$

C. s^{-1}

D. $mol\text{litre}^{-1}S^{-1}$

Answer: A

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32. The rate constant of a reaction is $1.2 \times 10^{-5}mol^{-2}\text{litre}^{2}S^{-1}$ the order of the reaction is

A. zero

B. 1

C. 2

D. 3

Answer: D

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33. The rate constant for a first order reaction whose half life is 480 sec, is :

A. $1.44 \times 10^{-3} s^{-1}$

B. $1.44 s^{-1}$

C. $0.72 \times 10^{-3} s^{-1}$

D. $2.88 \times 10^{-3} s^{-1}$

Answer: A

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34. The rate constant for the reaction

$2N_2O_5 \rightarrow 4NO_2 + O_2$

is $3.0 \times 10^{-5} s^{-1}$. If the rate is $2.40 \times 10^{-5} molL^{-1} s^{-1}$, then the concentration of N_2O_5 (in $molL^{-1}$) is

A. 1.4

B. 1.2

C. 0.04

D. 0.8

Answer: D

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35. For a hypothetical reaction $A \rightarrow B$, the rate constain is $0.25 s^{-1}$. If the concentration of A is reduced to half, then the value of rate constant is

A. $0.25\,\text{sec}^{-1}$

B. $0.30\,\text{sec}^{-1}$

C. $0.075\,\text{sec}^{-1}$

D. $2.25\,\text{sec}^{-1}$

Answer: A

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36. The rate constant of n^{th} order has units :

A. $\text{liter}^{\ 1-n} Mol^{1-n}\,\text{sec}^{-1}$

B. $Mol\text{litre}^{1-n}\,\text{sec}$

C. $Mol^{1-n^2}\text{litre}^{n^2}\,\text{sec}^{-1}$

D. $\text{Mole}^{1-n} : \text{litre}^{\ n-1}\,\text{sec}^{-1}$

Answer: D

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37. The rate of reaction between A and B increases by a factor of 100, when the concentration with respect to A is increased 10 folds, the order of reaction w.r.t. A is

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38. $2A + 2B \rightarrow D + E$ for the reaction following mechanism has been proposed .

$A + 2B \rightarrow 2C + d$(slow) $A + 2C \rightarrow E$ (fast)

The rate law expression for the reaction is

A. $Rate = K[A]^2[B]^2$

B. $\text{Rate} = [A]^2[B]^2[C]$

C. $\text{rate} = k = [A][B]^2$

D. $\text{Rate} = k[A][B]$

Answer: C

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39. For reaction of zero order is

A. $k = \frac{[A_0]}{t}$

B. $kt = [A_0] = [A]$

C. $Kt = [A] - [A_0]$

D. $k = \frac{2.303}{t} ln \frac{[A_0]}{[A]}$

Answer: B

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40. The number of atoms or molecules whose concentration changes during a chemical change is its

A. Order of reaction

B. Molecularity

C. changes in reaction

D. dynamics

Answer: A

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41. The reaction $H_2O_2 \rightarrow H_2O + [O]$ is a

A. first order reaction

B. second order reaction

C. zero order reaction

D. third order reaction

Answer: A

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42. The unit of the rate constant for first order reaction is

A. Mol^{-1}

B. $\sec^{-1}$

C. $\sec^{-1} mol_{-1} dm^3$

D. $Mol \sec^{-1} dm^3$

Answer: B

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43. Correct order for a first order reaction is

A. $t_{1/2} \propto C^{-1}$

B. $t_{1/2} \propto C$

C. $t_{1/2} \propto C^0$

D. $t_{1/2} \propto C^{\frac{1}{2}}$

Answer: C

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44. Which of the following is a first order reaction ?

A. $NH_4NO_2 \rightarrow N_2 + 2H_2O$

B. $2HI \Leftrightarrow H_2 + I_2$

C. $2NO_2 \Leftrightarrow 2NO + O_2$

D. $2NO_2 \Leftrightarrow 2NO + O_2$

Answer: A

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45. For a reaction between gaseous compounds, $2A + B \rightarrow C + D$, the reaction rate law is rate k[A][B]. If the volume of the container is made $1/4^{th}$ of the initial, then what will be the rate of reaction as compared to the initial rate?

A. $\frac{1}{16}$

B. $\frac{1}{8}$

C. 16 times

D. 8 times

Answer: C

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46. Order of a reaction can be

A. Fractional

B. zero

C. Negative

D. both (a) and (b)

Answer: D

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47. The rate constant of a reaction is $2.5 \times 10^{-2} \text{minutes}^{-1}$ The order of the reaction is

A. one

B. zero

C. two

D. three

Answer: A

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48. when concentration of reactant in reaction $A \rightarrow B$ is increased by 4 times , the rate increase only 2 times The order of the reaction would be

A. 2

B. $\frac{1}{3}$

C. 4

D. $\frac{1}{2}$

Answer: D

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49. In the presence of acid, the initial concentration of cane sugar was reduced from 0.2 M to 0.1 M in 5 h and to 0.05 M in 10 h. The reaction must be of

A. zero order

B. first order

C. second order

D. Fractional order

Answer: B

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50. For a zero order reaction, the plot of concentration, vs time is linear with

A. $+$ ve slope and zero intercept

B. $-$ ve slope and zero intercept

C. $+$ ve slope and non- zero intercept

D. $-$ ve slope and non- zero intercept

Answer: D

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51. The rate constant is given by the equation $k = P.\, Ze^{-E_a/RT}$. Which factor should register a decrease for the reaction to proceed more rapidly?

A. T

B. Z

C. A

D. Ea

Answer: D

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52. Which of the following is correct ?

A. molecularity of a reaction is same as the order of a reaction

B. in some cases order of a reaction may be same as the molecularity of the reaction

C. both (a) and (b) are correct

D. Molecularity is different from order of reaction

Answer: B

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53. Ethyl acetate is hydrolysed in acidic medium Its order of reaction and molecularity are respectively :

A. 1 and 1

B. 1 and 2

C. 2 and 1

D. 2 and 2

Answer: B

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54. For the single step reaction of the type $A + 2B \rightarrow E + 2F$, the rate law is

A. $Rate = k[A][B]$

B. $rate = \frac{k[E][F]^2}{[A][B]^2}$

C. $Rate = k[A][2B]$

D. $rate = k[A][B]^2$

Answer: D

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55. For a single step reaction $X + 2Y \rightarrow$ Products, the molecularity is

A. Zero

B. 1

C. 2

D. 3

Answer: D

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56. Which one of following formula represents the first order reaction ?

A. $k = \frac{2.303}{t} \log \frac{[A]}{[A_0]}$

B. $k = 2.303 \log \frac{a - x}{a}$

C. $[A = [A_0]e^{-kt}$

D. $k = \frac{2.303}{t}\log\frac{a+x}{a}$

Answer: C

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57. which of the following is a first order reaction ?

A. $2H_2O_{2(aq)} \xrightarrow{pt} 2H_2O + O_{2(g)}$

B. $2HI \rightarrow H_2 + I_2$

C. $2NO_2 \rightarrow 2NO + O_2$

D. $2NO + O_2 \rightarrow 2NO_2$

Answer: A

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58. Which of the following represents the expression for $3/4^{th}$ of concentration remaining of a first order reaction ?

A. $\frac{2.303}{k}\log\frac{4}{3}$

B. $\frac{2.303}{k}\log\frac{3}{4}$

C. $\frac{2.303}{k}\log 4$

D. $\frac{2.303}{k}\log 3$

Answer: A

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59. The chemical reactions in which the reactants require high amount of activation energy are generally

A. Slow

B. Fast

C. instantaneous

D. spontaneous

Answer: A

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60. If a is the initial concentration and K is the rate constant of a zero order reaction , the time for the reaction to go to completion wil be

A. $\frac{k}{a}$

B. $\frac{a}{k}$

C. $\frac{a}{2K}$

D. $\frac{K}{2a}$

Answer: B

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61. The activation energy of exothermic reaction $A \rightarrow B$ is $80kJ\text{mol}^{-1}$. The heat of reaction is $200kJ\text{mol}^{-1}$. The activation energy for the reaction $B \rightarrow A$ (in kJ/mol) will be :

A. 80 KJ

B. 120KJ

C. 280 KJ

D. 200KJ

Answer: B

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62. The activation energy for the forward reaction $X \rightarrow Y$ is $60kJmol^{-1}$ and ΔH is $-20kJmol^{-1}$. The activation energy for the reverse reaction is

A. $40KJmol^{-1}$

B. $60KJmol^{-1}$

C. $80KJmol^{-1}$

D. $20KJmol^{-1}$

Answer: C

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63. The rate of the first-order reaction $X \rightarrow$ products is $7.5 \times 10^{-4} molL^{-1} \min^{-1}$. What will be value of rate constant when the concentration of X is $0.5 molL^{-1}$?

A. $3.75 \times 10^{-4} \min^{-1}$

B. $2.5 \times 10^{-5} \min^{-1}$

C. 0.1×10^{-4}

D. 0.3×10^{-4}

Answer: C

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64. For the reaction

$N_2 + 3H_2 \rightarrow 2NH_3$ The rate of change of concentration for hydrogen is $0.3 \times 10^{-4} Ms^{-1}$ The rate of change of concentration of ammonia is :

A. -0.2×10^{-4}

B. 0.2×10^{-4}

C. 0.1×10^{-4}

D. 0.3×10^{-4}

Answer: B

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65. The reaction $2A + B \rightarrow B \rightarrow D + E$ involves the mechanism ,

$A \rightarrow B$(fast)

$B \rightarrow C$(slow)

$A + C \rightarrow D + E$

the rate expressio would be ,

A. $k[A]^2[B]$

B. $k[B]$

C. $k[A]$

D. $k[A][B]$

Answer: B

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66. The number of molecules of the reactants taking part in a single step of the reaction tells about :

A. Molecularity of the reaction

B. Mechanism of the reaction

C. Order of reaction

D. Mole fraction

Answer: A

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67. Rate of a chemical reaction can be kept constant by

A. Stirring the comounds

B. Keeping the tempature constant

C. Both (a) & (b)

D. Adding a catalyst

Answer: B

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68. Minimum energy required for molecules to react is called :

A. Kinetic energy

B. Potential energy

C. Heat energy

D. Activation energy

Answer: D

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69. The raction $2FeCl_3 + SnCl_2 \rightarrow 2FeCl_2 + SnCl_4$ is an example of

A. first order reaction

B. third order reaction

C. second order reaction

D. Zero order reaction

Answer: B

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70. The enzyme catalysed reaction is faster than metal catalysed reaction because its activation energy is

A. Greater

B. Lower

C. Same

D. Zero

Answer: B

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71. On adding $AgNO_3$ to $NaCl$ white ppt , occurs

A. Instananeosuly

B. with a measurable speed

C. Slowly

D. Depending on condition

Answer: A

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72. For a given reaction half - life period was found to be directly proporional to the initial concentration of the reaction ,The order is

A. zero

B. 1

C. 2

D. 3

Answer: A

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73. If initial concentration is doubled, the time for half-reaction is also doubled, the order of reaction is

A. first

B. second

C. Third

D. zero

Answer: D

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74. In hydrolysis of organic cholride with excess of water

$RCl + H_2O \rightarrow ROH + HCl$

A. Molecularity is 2 and order of reaction is also 2

B. Molecularity is 2 and order of reaction is 1

C. Molecularity is 1 and order of reaction is 2

D. Molecularity is 1 and order of reaction is 1

Answer: B

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75. Certain bimolecular reactions which follow the first order kinetics are called ____.

A. unimolecular reactions

B. pseudo unimolecular reactions

C. Fist order reactions

D. biomolecular reactions

Answer: B

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76. The hydrolysis of ethyl acetate is a reaction of :

$$CH_3COOC_2H_5 + H_2O \xrightarrow{H^+} CH_3COOH + C_2H_5OH$$

A. First order

B. Second order

C. third order

D. Zero order

Answer: A

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77. If [A] is the concentration of A at any time t and $[A]_0$ is the concentration at t=0 , then for the 1^{st} order reaction , the rate equation can be written as _____.

A. $k = \frac{2.303}{t} \log \frac{[A]}{[A_0]}$

B. $kt = 2.303 \log \frac{[A_0]}{[A]}$

C. $k = \frac{2.303}{t} \log \frac{[A_0]}{[A_0] - [A]}$

D. $k = \frac{2.303}{t} ln \frac{[A_0]}{[A]}$

Answer: B

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78. The logarithm of rate constant of a reaction

A. decreases linearly with increase in inverse of temperature

B. increases linearly with increases in inverse of temperature

C. increases linearly with increases in temperature

D. Decreases linearly with increases in temperature

Answer: A

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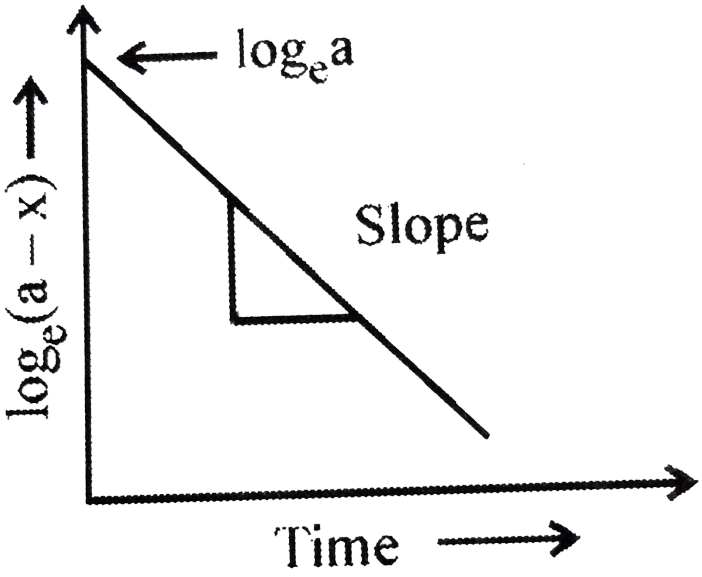
79. in the following plot for a first order reaction slope is equal to



A. $-k$

B. $-\frac{k}{2.303}$

C. $-\frac{2.303}{k}$

D. $-k \times 2.303$

Answer: A

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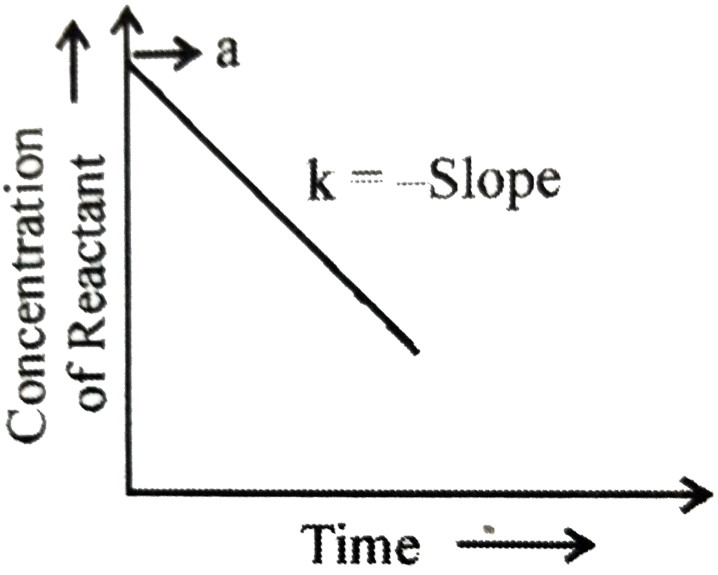

80.

The above plot is for _____ order rection to calculate value of rate constant .

A. Second

B. first

C. zero

D. First and zero

Answer: C

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81. The half-life period for the first order reaction is 693 seconds. The rate constant of this reaction would be

A. $0.1\,\sec^{-1}$

B. $0.01\,\sec^{-1}$

C. $0.001\,\sec^{-1}$

D. $0.0001\,\sec^{-1}$

Answer: C

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82. What is the order of the reaction which obeys the expression $t_{1/2} = \frac{1}{ka}$?

A. first

B. Second

C. third

D. zero

Answer: B

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83. The amount of radioactive ${}_{52}I^{123}\left(t_{1/2} = 25 \text{ minutes}\right)$ left after 50 minutes will be :

A. $\frac{1}{4}$

B. $\frac{1}{2}$

C. $\frac{1}{3}$

D. $\frac{1}{8}$

Answer: A

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84. The half -life period for a first order reaction is 69.3 S . Its rate constant is

A. $10^{-2}s^{-1}$

B. $10^{-4}s^{-1}$

C. $10s^{-1}$

D. $10^{2}s^{-1}$

Answer: A

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85. The half-life period of any first order reaction:

A. directly proportional to the initial concentration of the reactant

B. Half of the reactions

C. same for all reactions

D. indepent of initial concentration of reactions

Answer: D

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86. The half-life period of any first order reaction:

A. directly proptional to the initial concentration 'a'

B. inversely proportional to 'a '

C. independent of 'a'

D. indepent of the constant of the reaction

Answer: C

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87. The ratio of the times of 99.9 % of the reaction to complete and half of the reaction to complete is

A. 2

B. 4

C. 8

D. 10

Answer: D

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88. If initial concentration is reduced to $1/4^{th}$ in a zero order reaction , the time taken for half the reaction to complete

A. Remains same

B. becomes 4 times

C. becomes one - fourth

D. Doubles

Answer: C

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89. A 1^{st} order reaction has specific rate constant of $2\ \min^{-1}$ The half - life of this reaction will be _____.

A. 1.653min

B. 0.347min

C. 2Min

D. 0.5Min

Answer: B

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90. Radioactive decay is a

A. Zero order reaction

B. first order reaction

C. second order reaction

D. Third order reaction

Answer: B

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91. What is the half-life of a radioactive substance if $75\ \%$ of its given amount disintegrate in 60 min ?

A. 30 min

B. 45 min

C. 75 min

D. 90 min

Answer: A

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92. Arrhenius equation is

A. $k = A \cdot e^{E_a / RT}$

B. $k = A \cdot e^{-E_a / RT}$

C. $k = A \cdot e^{E_a T / R}$

D. $k = A \cdot e^{-RT / E_a}$

Answer: B

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93. The effect of temperature on reaction rate is given by

A. Kirchoff's equation

B. Arrhenious equation

C. Vander waal's equation

D. Kinetic equation .

Answer: B

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94. If the rate of reaction between A and B is given by rate $= k[A][B]^2$, then the reaction is :

A. First order in A

B. Second order in B

C. over all having second order

D. Both (a) and (b)

Answer: D

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95. The rate of reaction $A + B + C \rightarrow$ product is given by $r = K[A]^{1/3}[B]^{1/2}[C]$. The order of the reaction is

A. 1

B. 3

C. $\frac{5}{6}$

D. $\frac{11}{6}$

Answer: D

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96. The order of a reaction is determined from:

A. Chemical Equation

B. Experiments

C. Rate constant

D. Thermochemical Equation

Answer: B

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97. For the reaction $A \rightarrow C$ it is found that the rate of the reaction quadruples when the concentration of A is doubled . The rate for the reaction is Rate $=[A]^n$ where the value of n is

A. 1

B. 2

C. zero

D. 3

Answer: B

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98. What is the order of a reaction which has a rate expression, i.e. rate = $k[A]^{3/2}[B]^{-1}$?

A. $\frac{3}{2}$

B. $\frac{1}{2}$

C. Zero

D. 1

Answer: B

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99. A chemical reaction is the result of

A. oxidation

B. reduction

C. effective collisions

D. activation state

Answer: C

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100. For producing effective collisions, the colliding molecules must have

A. a certain amount of energy

B. sufficient kinetic energy

C. sufficient potential energy

D. maximum energy of activation

Answer: B

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101. The minimum energy needed to convert a reactant into product is called

A. Potential energy

B. Kinetic energy

C. Threshold energy

D. Activation energy

Answer: D

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102. Orienation factor is direclty proportional to

A. Callision frequency

B. Freaction of molecule

C. Rate of reaction

D. Threshold energy

Answer: C

Watch Video Solution

103. Collision theory is satisfactory for:

A. Unimolecular reactions

B. Pseudo unimolecular reactions

C. Bimolecular reactions

D. Zero order reactions

Answer: C

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104. For producing effective collisions, the colliding molecules must have

A. certain minimum amount of energy

B. energy equal to or greater than the threshold energy

C. Proper orientation

D. threshold energy and proper orientation both

Answer: D

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105. In a reaction, the threshold energy is equal to

A. Activation energy

B. activation energy -normal energy

C. activation energy + normal energy

D. normal energy of reactants only

Answer: C

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106. The collision frequency is

A. inversely proportional to the concentration of the treacting molecules

B. Proportional to the concentration of the reacting molecules

C. equal to the concentration of reactants

D. equal to the concentration of products

Answer: B

Watch Video Solution

107. The reaction between $H_{2(g)}$ and $ICI_{(g)}$ occurs in the following steps:

$H_2 + ICI \rightarrow HI + HCI$

$HI + ICI \rightarrow I_2 + HCI$

The reaction interemediate in the reaction is

A. HCI

B. HI

C. I_2

D. ICI

Answer: B

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108. The rate constant of a reaction

A. Decreases with increasing E_a

B. Decreases with decreasing E_a

C. is independent of E_a

D. decreases with increasing temperature

Answer: A

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109. A catalyst increases the rate of the temperature

A. increasing E_a

B. increasing T

C. decreasing E_a

D. decreasing T

Answer: C

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110. The formation of SO_3 from SO_2 and O_2 takes place in the following steps :

$(i) SO_2 + 2NO_2 \rightarrow 2SO_3 + 2NO$

$(ii) 2NO + O_2 \rightarrow 2NO_2$

A. NO_2 is intermediate

B. NO is catalyst

C. NO_2 is catayst and NO is intermediate

D. NO is catalyst and NO_2 is intermediate

Answer: C

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111. Arrhenius equation is

A. $A = ke^{-E_a/RT}$

B. $\frac{A}{k} = e^{-E_a/RT}$

C. $k = Ae^{-E_a/RT}$

D. $k = Ae^{-RT/R_a}$

Answer: C

Watch Video Solution

112. The activation energy of reaction is equal to

A. Threshold energy + Energy of the prosucts

B. Threshold energy - energy of the reactants

C. Threshold energy + Energy of the reactants

D. Threshold energy - Energy of the products

Answer: B

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113. An endothermic reaction, $A \rightarrow B$ have an activation energy $15kcal/mol$ and the heat of the reaction is $5kcal/mol$. The activation energy of the reaction, $B \rightarrow A$ is:

A. 10 kcal mole^{-1}

B. 20 kcal mole^{-1}

C. 40 kcal mole^{-1}

D. 100 kcal mole^{-1}

Answer: A

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114. According to the Arrhenius equation a straight line is to be obtained by plotting the logarithm of the rate constant of a chemical reaction $(\log k)$ against

A. T

B. $\log T$

C. $\frac{1}{T}$

D. $\log \frac{1}{T}$

Answer: C

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115. The rate of reaction of spontaneous reaction is generally very slow . This is due to the fact that

A. the equolibrium energy of the reaction is large

B. the activation energy of the reaction if large

C. The reaction are exothermic

D. the reaction are endothermic

Answer: B

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116. The reactions of higher order are rare because

A. many body collisions involve very high activation energy

B. many body collisons have a low energetically favoured

C. many body collisions are not energetically favoured

D. many body collisions can take place only in the gaseous phase

Answer: B

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117. An increse in the concentration of the reactants of a reaction leads to change in:

A. Heat of reaction

B. Threshold energy

C. collision frequency

D. Activation energy

Answer: C

Watch Video Solution

118. The chemical reactions in which the reactants require high amount of activation energy are generally

A. Slow

B. Fast

C. instantaneous

D. spontaneous

Answer: A

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119. Which of the following is the correct expression for Arrhenius equation ?

A. $ln\frac{k_2}{k_1} = \frac{E_a}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$

B. $lnk = lnA - \frac{E_a}{RT}$

C. $k = A \cdot e^{\frac{E_a}{RT}}$

D. All the above

Answer: D

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120. rate constant of a reaction at 290 K was found to be 3.2×10^{-3}. At 300 K it will be

A. 1.6×10^{-3}

B. 6.4×10^{-3}

C. 3.2×10^{-4}

D. 3.2×10^{-2}

Answer: B

Watch Video Solution

121. The activation energy of a reaction is 9 kcal mole^{-1}. The increase in the rate cnstant when its temperature is raised from 295 to 300 approximately

A. 1.289 times

B. 12.89 times

C. 0.1289 times

D. 0.25

Answer: A

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122. The rate constant is given by the equation $k = P.\ Ze^{-E/RT}$. Which factor should register a decrease for the reaction to proceed more rapidly ?

A. E_a

B. T

C. Z

D. P

Answer: A

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123. In the reaction $2A + B \rightarrow$ product , if active mass of B remains constant but active mass of A is doubled the rate of reaction will be

A. increased twice

B. increased 4 times

C. decreased 2 times

D. decreased 4 times

Answer: B

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124. The rate of the reaction may be expressed by the following different ways .

$$\frac{1}{2}\frac{d[A]}{dt} = -\frac{1}{3}\frac{d[B]}{dt} = \frac{-d[C]}{dt}$$

reaction is

A. $3B + C \rightarrow 2A$

B. $2A + B \rightarrow C$

C. $3A + 2B \rightarrow 6C$

D. $2A \rightarrow 3B + C$

Answer: A

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125. The rate for the 1^{st} order reaction is $0.69 \times 10^{-2} molL^{-1}\ \min^{-1}$ and the initial concentration is 0.2 mol L^{-1} . The half life period is ____.

A. 1200S

B. $0.33S$

C. 600S

D. 1S

Answer: A

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126. Pieces of wood burn faster than a log of wood of the same mass because

A. surface area of log of wood is larger and needs more time to burn

B. pieces of wood have lager surface area

C. All pieces of wood catch fire at the same time

D. Block of wood has higher density than pieces of the same wood

Answer: B

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127. When the concentration of a reactant in reaction $A \rightarrow B$ is increased by 8 times but rate increases only 2 times, the order of the reaction would be

A. 2

B. $\frac{1}{3}$

C. 4

D. $\frac{1}{2}$

Answer: B

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128. if the rate of reaction between A and B is given by rate $= k[A][B^n]$ then the reaction is

A. first order in A

B. n^{th} order in B

C. over all order is (1+n)

D. all are correct

Answer: D

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129. IF velocity constant of any reaction $[k']$ is two times of velocity constant $[k'']$ of other reaction . The activation energies $[E'_a \text{ and } E''_a]$ will be :

A. $E_a > E_a^{\eta}$

B. $E_a = E_a^{\eta}$

C. $E_a < E_a{}'$

D. $E_a = 4E_a^{\eta}$

Answer: C

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130. The rate law for the chemical reaction :

$2NO_2Cl \rightarrow 2NO_2 + Cl_2$

is : rate $=K[NO_2Cl]$. the rate determining step is

A. $2NO_2Cl \rightarrow 2NO_2 + 2Cl$

B. $NO_2 + Cl \rightarrow NO_2Cl + Cl$

C. $NO_2Cl + Cl \rightarrow NO_2 + 2Cl_2$

D. $NO_2Cl \rightarrow NO_2 + Cl$

Answer: D

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131. For an imaginary reaction $2X + 3Y \rightarrow \text{products}$

Given: rate of disappearance of $X = r_1$

rate of disappearance of $Y = r_2$

r_1 and r_2 are related as:-

A. $3r_1 = 2r_2$

B. $r_1 = r_2$

C. $2r_1 = 3r_2$

D. $r_1 = 2r_2$

Answer: A

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132. For the reaction $2NO_2 + F_2 \rightarrow 2NO_2F$, following mechanism has been provided:

$$NO_2 + F_2 \xrightarrow{\text{slow}} NO_2F + F$$

$$NO_2 + F \xrightarrow{\text{fast}} NO_2F$$

Thus rate expression of the above reaction can be writtens as:

A. $r = K[NO_2)]^2[F_2]$

B. $r = K[NO_2][F_2]$

C. $r = k[NO_2]$

D. $r = k[F_2]$

Answer: B

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133. A first orde reaction is 75% completed after 32min. When was 50% of the reaction completed?

A. 16 minutes

B. 8 minutes

C. 4 minutes

D. 32 minutes

Answer: A

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134. The thermal decomposition of a compound is of first order. If 50% of a sample of the compound is decomposed in 120 minutes, how long it take for 90% of the compounds to decompose.

A. About 240 minutes

B. About 480 minutes

C. About 45 minutes

D. About 400 minutes

Answer: D

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135. In the sequence of reaction,

$L \xrightarrow{k_1} M \xrightarrow{k_2} N \xrightarrow{k_3} O$

$k_3 > k_2 > k_1$

The rate determining step of the reaction is :

A. $A \rightarrow B$

B. $B \rightarrow C$

C. $c \rightarrow D$

D. $A \rightarrow D$

Answer: A

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136. In the reaction $2A + B \rightarrow$ products the order w.r.t A is found to be one and w.r.t B equal to 2 . Concentration of A is doubled and that of B is halved , the rate of reaction will be

A. double

B. halved

C. remain unaffected

D. four times

Answer: B

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137. The rate constant of a zero order reaction is$0.2molL^{-3}h^{-1}$. If the concentration of the reactant after 30 min is 0.05 mol dm^{-3}, then its initial concentration would be

A. $0.01\text{Mol} \quad dm^{-3}$

B. $0.15\text{Mol}\quad dm^{-3}$

C. $0.25\text{Mol}dm^{-3}$

D. $4.00\text{Mol}dm^{-3}$

Answer: B

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138. A first order reaction has a half - life period of 69 .3 sec at $0.10\text{Mol litre}^{-1}$ reactant concentration then the rate constant will be

A. $10^{-4}\,\text{sec}^{-1}$

B. $10^{-3}\,\text{sec}^{-1}$

C. $10^{-1}\,\text{sec}^{-1}$

D. $6.93 \times 10^{-1}\,\text{sec}^{-1}$

Answer: B

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139. For the equilibrium $2NO_2(g) \Leftrightarrow N_2O_4(g) + 14.6$ Kcal the increase in temperature would

A. Favour formation of N_2O_4

B. Favour decomposition of N_2O_4

C. Not affect the equilibrium

D. stop the reacation

Answer: B

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140. The rate of a first order reaction is $1.8 \times 10^{-3} \text{Mol} \quad L^{-1} \text{Min}^{-1}$. When the initial concentration is $0.3 \text{Mol} \quad L^{-1}$. The rate constant in the units of second is

A. $1 \times 10^{-2} S^{-1}$

B. $1 \times 10^{-4} S^{-1}$

C. $6 \times 10^{-2} S^{-1}$

D. $6 \times 10^{-4} S^{-1}$

Answer: B

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141. For a second order reaction rate at a particular time is X . IF the initial concentration is tripled is tripled the rate will become

A. $3x$

B. $9x^2$

C. $9x$

D. $27x$

Answer: C

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142. An endothermic reaction $A \rightarrow B$ has an activation energy as K KJ Mol^{-1} of A . If energy change of the reaction is Y KJ , the activation of the reverse reaction is

A. $-X$

B. $X - Y$

C. $x + y$

D. $Y - X$

Answer: B

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143. We can represent the decomposition of $N_2O_5(g)$ at a fixed temperature by the following two chemical equations:

(P) $2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g)$,

Activation energy E_a

(Q) $N_2O_5(g) \rightarrow 2NO_2(g) + \frac{1}{2}O_2(g)$,

Activation energy E'_a then:

A. $E_1 > E_2$

B. $E_1 < E_2$

C. $E_1 = 2E_2$

D. $E_1 = E_2$

Answer: D

Watch Video Solution

144. The rate of a chemical reaction doubles for every $10^{\circ}C$ rise in temperature .If the temperature is increased by $60^{\circ}C$ the rate of reaction increases by about

A. 20 times

B. 32 times

C. 64 times

D. 128 times

Answer: C

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145. In a first order reaction, $75\,\%$ of the reactants disappeared in $1.386hr$. What is the rate constant ?

A. $3.6 \times 10^{-3} S^{-1}$

B. $2.8 \times 10^{-4} S^{-1}$

C. $17.2 \times 10^{-3} S^{-1}$

D. $1.8 \times 10^{-3} S^{-1}$

Answer: B

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146. For a first order reaction, the ratio of time for the completion of 99.9% and half of the reaction is

A. 2

B. 3.323

C. 6.656

D. 10

Answer: D

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147. For the reaction, for which the activation energies for forward and backward reactions are same, then:

A. $\Delta H = 0$

B. $\Delta S = 0$

C. the order is zero

D. there is not catayst

Answer: A

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148. the hydrolysis of ethyl acetate was carried out separately with 0.05 MHCI and 0.05 MH_2SO_4 .The rate constants were found to be K_1 and K_2 respectively . Then

A. $K_1 = K_2$

B. $K_1 > K_2$

C. $k_1 < K_2$

D. $k_2 = 2K_2$

Answer: C

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149. the concentration of a reactant in a solution falls (i) from 0.2 to 0.1 M in 2 hrs ,(ii) from 0.2 to 0.05 m in 4 hrs , the order of the hydrolysis of the reactant is

A. zero

B. two

C. one

D. half

Answer: C

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150. A first order reaction takes 100 min for completion of 60 % of reaction ,The time eequired for completion of 90% of the reaction is

A. $150\ \min$

B. $200\min$

C. $220.9\min$

D. $246.6\ \min$

Answer: D

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151. The relationship between half life and initial concentration is given by

A. a^{n-1}

B. $\frac{1}{a^{n-1}}$

C. a^{-n}

D. $\frac{1}{a}$

Answer: B

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152. for the first order reaction the half life period is (if K is rate constant and α in initial concentration)

A. $\frac{ln2}{k}$

B. $\frac{1}{k\alpha}$

C. $\frac{lnk}{2}$

D. $\frac{\log k}{2}$

Answer: A

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153. If a is the initial concentration of the rectant, the half life period of the reaction of n^{th} order is inversely proportional to :

A. a^{n-1}

B. a^n

C. a^{1-n}

D. a^{n+1}

Answer: C

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154. for a first order reaction we have $k = 100\,\text{sec}^{-1}$ .The time for completion of 50% reaction is

A. 1 millisec

B. 4 millisec

C. 7 millisec

D. 10 millisec

Answer: C

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155. The half-life period or a first order reaction is 1 hrs. What is the time in hour taken for $87.5\ \%$ completion of the reaction?

A. 1 hours

B. 2 hours

C. 3 hours

D. 4 hours

Answer: C

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156. A first order reaction is 50 % completed in 30 minutes . The rate constant of the reaction is

A. 2.31min^{-1}

B. $2.31 \times 10^{2} \text{min}^{-1}$

C. $2.31 \times 10^{2} \mathrm{min}^{-1}$

D. $2.31 \times 10^{-1} \mathrm{min}^{-1}$

Answer: C

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157. The reaction $L \rightarrow$ M is started with 10 g of L .A After 30 and 90 minute , 5g and 1.25 g of L are left respectively . The order of reaction is

A. 0

B. 2

C. 1

D. 3

Answer: C

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Watch Video Solution

158. The rate of reaction , $A + B + C \rightarrow$ product is given by : rate $= K[A]^{1/2}[B]^{1/3}$ [C] . The order of the reaction is _____.

A. 1

B. 3

C. $\frac{5}{6}$

D. $\frac{11}{6}$

Answer: D

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159. Which of the following theory is not related to the chemical kinetics?

A. Collision theory

B. Absolute reaction rate theory

C. VSEPR theory

D. Transition state theory

Answer: C

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160. Collision frequency is

A. The number of collision per second of the reaction mixute

B. the number of collision per unit area of the reaction mixture

C. the number of collision per second per unit volume of the reaction mixture

D. the number of collision per unit volume of the reaction mixture

Answer: C

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161. Consider the reaction $2NO_{(g)} + O_{2(g)} \rightarrow 2NO_{2(g)}$.

if $\frac{d[NO_2]}{dt} = 0.052M/s$ then $-\frac{d[O_2]}{dt}$ will be

A. $0.052M/s$

B. $0.114M/s$

C. $0.026M/s$

D. $-0.026M/s$

Answer: C

Watch Video Solution

162. The rate of the first reaction $A \rightarrow$ products is $0.01M/s$, when reactant conentration concentration is 0.2 M. The rate constant for the raction will be

A. $0.05s^{-1}$

B. 0.05min^{-1}

C. $0.1S^{-1}$

D. $0.01S^{-1}$

Answer: A

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163. The slope of a graph l n $[A_t]$ versus t for a first order reaction is $-2.5 \times 10^{-3}s^{-1}$. The rate constant for the reaction will be

A. $5.76 \times 10^{-3}s^{-1}$

B. $1.086 \times 10^{-3}s^{-1}$

C. $-2.5 \times 10^{-3}s^{-1}$

D. $2.5 \times 10^{-3}s^{-1}$

Answer: A

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164. $A + 2B \rightarrow C + D$ for a reaction from following data correct rate law =

	Mole (A)	Litre^{-1} (B)	mole litre^{-1} min^{-1}
1	0.1	0.1	6.0×10^{-3}
2	0.3	0.2	7.2×10^{-2}
3	0.3	0.4	2.88×10^{-1}
4	0.4	0.1	2.4×10^{-2}

A. $\text{Rate} = K[A]^2[B]$

B. $\text{rate} = k[A]^2[B]^2$

C. $\text{Rate} = K[A][B]^2$

D. $\text{Rate} = K[A][B]$

Answer: C

Watch Video Solution

165. when concentration of reactant is incresed eighteen times the rate becomes two times , the rate of reaction is

A. 1

B. $\frac{1}{2}$

C. $\frac{1}{3}$

D. $\frac{1}{4}$

Answer: C

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166. The rate constant of a reaction has same dimensions as rate of reaction The reaction is of

A. third order

B. second order

C. first order

D. zero order

Answer: D

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167. The rate constant of reaction is $5 \times 10^{-2} \text{litre}^{3} \text{mole}^{-3} \text{min}^{-1}$ the order of reaction is

A. 1

B. 2

C. 3

D. 4

Answer: D

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168. For the first order reaction with half life is 150 seconds , the time for the concentration of the reactant to fall from m/ 10 to m/100 will be approximately

A. 600 s

B. 900s

C. 500s

D. 1500s

Answer: C

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169. For an exothermic reaction an activation energy of 70 KJ mole^{-1} and the enthalpy change of reaction is 30 KJ mole^{-1} . The

order of the reaction is

A. $70KJmole^{-1}$

B. $30KJmole^{-1}$

C. $40KJmole^{-1}$

D. $100KJmole^{-1}$

Answer: D

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170. For rate of reaction $A+B+C\rightarrow$ products is given by $r=k[A][B]^{0}[C]$, if A is taken in large excess , the order of the reaction would be

A. 0

B. 1

C. 2

D. nil

Answer: B

Watch Video Solution

171. for a raction ,$I^- + OCI^- \rightarrow IO^- + Cl^-$ in an aqueous medium , the rate of reaction is given by

$$\frac{d[IO]^-}{dt} = k\frac{[I^-][OCI^-]}{[OH^-]}$$

the overall order of reaction is

A. -1

B. 0

C. 1

D. 2

Answer: C

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172. Dependance of rate on concentration is expressed by

A. Rate law

B. order of reaction

C. Molecularity

D. Law of mass action

Answer: A

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173. unit of rate is

A. $Moldm^{-3}$

B. $moldm^{3}$

C. $\frac{Moldm^{-3}}{\sec}$

D. $\frac{Moldm^{3}}{\sec}$

Answer: C

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174. For which order reaction, the unit of rate constant is time^{-1} ?

A. Zero order

B. first order

C. Second order

D. thrid order

Answer: B

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175. Which is a correct integrated rate equation?

A. $k = -2.303 \log_{10} \frac{a}{(a-x)}$

B. $K = -\frac{2.303}{t} \log_{10} \frac{(a-x)}{a}$

C. $k = \frac{1}{t} \log_{10} \frac{a}{(a-x)}$

D. $k = -2.303 \log_{10} \frac{[A]_0}{[At]}$

Answer: B

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176. The first order integrated rate equation is

A. $k = t_{l_n} \frac{a}{a-x}$

B. $k = \frac{1}{l} l_n \frac{a-x}{a}$

C. $k = \frac{1}{t} l_n \frac{a}{a-x}$

D. $k = t l_n \frac{a-x}{a}$

Answer: C

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177. The unit of the rate constant for first order reaction is

A. mol / lit

B. (mol / lit) time^{-1}

C. time^{-1}

D. (mol/lit) time

Answer: C

Watch Video Solution

178. for first order reaction

A. $-k = \frac{2.303}{t}\log\frac{(a-x)}{a}$

B. $\lambda = \frac{2.303}{t}\log\frac{N_t}{N_0}$

C. $-K = \frac{2.303}{t}\log\frac{a}{a-x}$

D. $\lambda = 2.303t\log\frac{a}{a-x}$

Answer: A

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179. Number of reactant molecules taking part in a reaction is

A. Order of reaction

B. Molecularity of the reaction

C. Rate of reaction

D. Conplex reaction

Answer: B

Watch Video Solution

180. Rate of a reaction

A. increases with increase in temperature

B. decreases with increase in temperature

C. does not depend on temperature

D. does not depend on concentration

Answer: A

View Text Solution

181. A chemical reaction is the result of

A. oxidation

B. reduction

C. effecitive collisions

D. activation state

Answer: C

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182. Which of the following is a first order reaction ?

A. $NH_4NO_2 \rightarrow N_2 + 2H_2O$

B. $2HI \Leftrightarrow H_2 + I_2$

C. $2NO_2 \Leftrightarrow 2NO + O_2$

D. $2NO + O_2 \Leftrightarrow 2NO_2$

Answer: A

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183. the Order of reaction can be deduced from

A. chemical Equation

B. Experiments

C. Rate constant

D. thermochenical Equation

Answer: B

Watch Video Solution

184. For producing effective collisions, the colliding molecules must have

A. minimum potential energy

B. sufficient kinetic enrgy

C. sufficient potential energy

D. Maximum energy of activation

Answer: B

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185. The rate of the first-order reaction $X \rightarrow$ products is $7.5 \times 10^{-4} molL^{-1}\min^{-1}$. What will be value of rate constant when the concentration of X is $0.5 molL^{-1}$?

A. 8×10^{-4}

B. 1.5×10^{-3}

C. 2.5×10^{-5}

D. 3.75×10^{-4}

Answer: B

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186. The reaction $L \rightarrow$ M is started with 10 g of L .A After 30 and 90 minute , 5g and 1.25 g of L are left respectively . The order of reaction is

A. 0

B. 2

C. 1

D. 3

Answer: C

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187. For the reaction between A and B

$A + B \rightarrow$ product

the following rate data were obtained .

Expt.	Initial Conc. (mol/dm^3)		Rate
	[A]	[B]	
1	0.1	0.2	1.2×10^{-2}
2	0.3	0.2	3.6×10^{-2}
3	0.1	0.4	4.8×10^{-2}

the reaction is

A. Zero order

B. first order

C. second order

D. third order

Answer: D

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188. the half life of the first order reaction is 346.5 sec the rate constant for the reaction is

A. $2 \times 10^{-3} \sec^{-1}$

B. $5 \times 10^{2} \sec^{-1}$

C. $2.4 \times 10^{2} \sec^{-1}$

D. $1.44 \times 10^{-3} \sec^{-1}$

Answer: A

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189. Initial concentration of reactant of Zero order reaction is 0.04 M, rate constant of the reaction is $1.2 \times 10^{-3} moldm^{-3} \sec^{-1}$. Hence the half life time is

A. 57.75sec

B. $16.66 \sec$

C. $33.33 \sec$

D. $5.77 \sec$

Answer: B

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190. In accordance to Arrhenius equation, the plot of log k against $\frac{1}{T}$ is a straight line. The slope of the line is equal to

A. $-\frac{E_a}{R}$

B. $-\frac{E_a}{2.303}$

C. $-\frac{E_a}{2.303R}$

D. $-\frac{2.303}{E_aR}$

Answer: C

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191. The activation energy of a reaction is zero. The rate constant of the reaction

A. increases with increaes in temperature

B. decreases with increases in temperature

C. increases with decrease in temperature

D. is almost independent of temperature

Answer: D

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192. For firt order reaction, fraction fo colllisions with proper orientation of colloiding molecules is 1×10^{-2}, collision frequency is 2×10^{4} and fraction of successive collisions is 0.5×10^{3}, then the rate constant for the reaction is

A. $2.5 \times 10^{-4} \sec^{-1}$

B. $1 \times 10^{5} \sec^{-1}$

C. $1 \times 10^{-9} \text{mol } dm^{-3}$

D. $1 \times 10^{5} moldm^{3} \sec^{-1}$

Answer: B

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193. Arrhenius equation is

A. $A = ke^{-E_a / RT}$

B. $K = Ae^{Ea / RT}$

C. $\frac{A}{K} = e^{E_a / RT}$

D. $K = Ae^{-RT / E_a}$

Answer: C

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194. In Arrhenius equation , $K = Ae^{-E_a/RT}$. The A is

A. fraction of collision

B. frequency factor

C. collision frequency

D. Collision factor

Answer: B

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195. For the reaction $A + B \rightarrow$ product

$[A] = [B] = 1$ M the rate of reaction is 2×10^{-2}mol $dm^{-3} \sec^{-1}$, then the rate of reaction at the time of 90 % of each of the reactants are converted into product is `

A. $1.8 \times 10^{-2} moldm^{-3} \sec^{-1}$

B. $2 \times 10^{-4} moldm^{-3} \sec^{-1}$

C. $1.62 \times 10^{-4} moldm^{-3} \sec^{-1}$

D. $4.05 \times 10^{-1} moldm^{-3} \sec^{-1}$

Answer: B

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196. The intergrated rate equation is $Rt = \log, C_0 - \log C_t$. The straight line graph is obtained by plotting:

A. time vs log C_t

B. $\frac{1}{\text{time}} vs C_t$

C. time vs C_t

D. $\frac{1}{\text{time}} vs \frac{1}{C_t}$

Answer: A

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197. In respect of the equation $k = Ae^{-Ea/RT}$ in chemical kinetics, which one of the following statements is correct?

A. A is adsorption factor

B. E_a is energy of activation

C. R is Rydberg's constant

D. K is equilibrium constant

Answer: B

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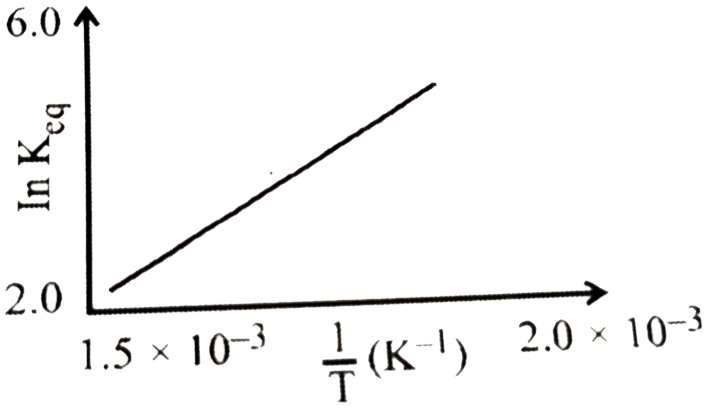
198. A schematic plot of In K_{eq} versus inverse of temperature for a reaction is shown below .



The reaction must be

A. exothermic

B. endothermic

C. one with negligble enthalpy change

D. highly spontaneous at ordinary temperature

Answer: A

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199. For a reaction $\frac{1}{2}A \rightarrow 2B$, rate of disappearance of $'A'$ is related to the rate of apperance of $'B'$ by the expression:

A. $-\frac{d[A]}{dt} = \frac{1}{2}\frac{d[B]}{dt}$

B. $-\frac{d[A]}{dt} = \frac{1}{4}\frac{d[B]}{dt}$

C. $-\frac{d[A]}{dt} = \frac{d[B]}{dt}$

D. $-\frac{d[A]}{dt} = 4\frac{d[B]}{dt}$

Answer: B

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200. The time for half-life period of a certain reaction, $A \rightarrow$ products is $1h$. When the initial concentration of the reactant $'A'$ is $2.0 \text{mol} L^{-1}$, how much time does it take for its concentration to come from 0.50 to $0.25 \text{mol} L^{-1}$, if it is zero order reaction ?

A. 4h

B. $0.5h$

C. $0.25h$

D. $1h$

Answer: C

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201. Consider the reaction,

$Cl_2(aq) + H_2S(aq) \rightarrow S(s) + 2H^+(aq) + 2Cl^-(aq)$

The rate equation for this reaction is,

Rate $= k[Cl_2][H_2S]$

Which of these mechanisms is/are consistent with this rate equation ?

(I) $Cl_2 + H_2S \rightarrow H^+ + Cl^- + Cl^+ + HS^-$ (slow)

$Cl^+ + HS^- \rightarrow H^+ + Cl^- + S$ (fast)

(II) $H_2S \Leftrightarrow H^+ + HS^-$ (fast equilibrium)

$Cl^+ + HS^- \rightarrow 2Cl^- + H^+ + S$ (slow)

A. B only

B. Both A and B

C. Neither A nor B

D. A only

Answer: D

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202. The rate of a chemical reaction doubles for every $10^\circ C$ rise of temperature. If the temperature is raised by $50^\circ C$, the rate of the reaction increases by about

A. 24 times

B. 32 times

C. 64 times

D. 10 times

Answer: B

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203. For a first order reaction , $A \rightarrow$ Products, the concentrations of A changes from 0.1 M to 0.025 M in 40 minutes. The rate of reaction when the concentration of A is 0.01 M is:

A. $1.73 \times 10^{-5} m / \text{ min}$

B. $3.47 \times 10^{-4} M / \text{ min}$

C. $3.47 \times 10^{-5} \frac{M}{\text{min}}$

D. $1.83 \times 10^{-4} M / \text{ min}$

Answer: B

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204. The specific rate constant of a first order reaction depends on the

A. concentration of the reactant

B. concentration of product

C. time

D. temperature

Answer: D

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205. Which one of the following is wrongly matched ?

A. saponification of $CH_3COOC_2H_5$ - second order reaction

B. Hydrolysis of CH_3COOCH_3 - pseudounimolecular reaction

C. Decompostion of H_2O_2 - first order reaction

D. Combination of H_2 and Br_2 to give HBr - zero order reaction

Answer: D

View Text Solution

206. Conisder the chemical reaction

$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

The rate of this reaction can be expressed in terms of time derivatives of the concentration of $N_2(g)$, $H_2(g)$, or $NH_3(g)$. Identify the correct relationship among the rate expresisons.

A. $\text{rate} = -d[N_2]/dt = -1/3d[H_2]/dt = 1/2d[NH_3]/dt$

B. $\text{rate} = -d[N_2]/dt = -3d[H_2]/dt = 2d[NH_3]/dt$

C. $\text{Rate} = d[N_2]/dt = -3/3d[H_2]/dt = 1/2d[NH_3]/dt$

D. $\text{rate} = d[N_2]/dt = -d[H_2]/dt1/2s[NH_3]/dt$

Answer: A

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207. In a first order reaction, the concentration of the reactant decreases form 800mol dm^{-3} to 50mol dm^{-3} in $2 \times 10^4 s$. The rate constant of the reaction (in s^{-1}) is

A. 2×10^4

B. 3.45×10^{-5}

C. 1.386×10^{-4}

D. 2×10^{-4}

Answer: C

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208. The reaction $X \rightarrow Y$ (Product) follows first order kinetics. In 40 minutes, the concentration of X changes from 0.1M to 0.025 M , then rate of reaction when concentration of X is 0.01M is :

A. $1.73 \times 10^{-4} M \text{ min}^{-1}$

B. $3.47 \times 10^{-5} M \text{ min}^{-1}$

C. $3.47 \times 10^{-4} M \text{ min}^{-1}$

D. $1.73 \times 10^{-5} M \text{ min}^{-1}$

Answer: C

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209. The following data were obtained during the first order thermal decomposition of SO_2Cl_2 at a constant volume

$SO_2Cl_2(g) \rightarrow SO_2(g) + Cl_2(g)$

$SO_2Cl_2(g) \longrightarrow SO_2(g) + Cl_2(g)$

Experiment	Time/s^{-1}	Total pressure/atm
1	0	0.5
2	100	0.6

Calculate the rate of the reaction when total pressure is 0.65 atm

A. $0.35 atm S^{-1}$

B. $2.235 \times 10^{-3} atm S^{-1}$

C. $7.8 \times 10^{-4} atm s^{-1}$

D. $1.55 \times 10^{-4} atm S^{-1}$

Answer: C

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210. For a first order reaction $A \to P$, the temperature (T) dependent rate constant (k) was found to follow the equation

$\log k = -2000(1/T) + 6.0$. The pre-exponential factor A and the activation energy E_a, respective, are

A. $1.0 \times 10^6 S^{-1}$ and $9.2 KJmol^{-1}$

B. $6.0 \times 10^6 S^{-1}$ and $16.6 KJmol^{-1}$

C. $1.0 \times 10^6 S^{-1}$ and $16.6 KJmol^{-1}$

D. $1.0 \times 10^6 S^{-1}$ and $38.3 KJmol^{-1}$

Answer: D

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211. For a reaction $x + y \rightarrow z$ data is as follows :

Expt.	[x]	[y]	Rate $\times 10^{-1}$ m/s
1	1 M	1 M	0.25
2	2 M	1 M	0.50
3	1 M	2 M	0.25
4	1 M	3 M	0.25

which one is the rate law equation ?

A. Rate $= k[x][y]$

B. rate $= k\left[x^0\right][y]$

C. Rate $= k[x][y]^2$

D. Rate $= k[x][y]^0$

Answer: D

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212. For a reaction ,$A + B \rightarrow C$ data is as follows :

Expt.	[A]	[B]	Rate
1	0.03	0.02	0.2
2	0.06	0.04	1.6
3	0.03	0.04	0.2
4	0.06	0.02	1.6

the rate law for the reaction is

A. Rate $= K[B]^3$

B. Rate $= [A]^2[B]$

C. Rate $= k[A]^3$

D. Rate $= [A][B]^2$

Answer: C

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213. The reaction ,

$2N_2O_5 \rightarrow 4NO_2 + O_2(g)$ if first order with respect to `

A. P_{NO_2} vs time

B. $\log_{10} P_{N_2O_5}$ vs time with a positive slope

C. $P_{N_2O_5}$ vs time

D. $\log_{10} P_{N_2O_5}$ vs time with a negative slope

Answer: D

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214. A first order reaction is one-fifth completed in 40 minutes. The time reuired for its $100\ \%$ completion is :

A. 50 minutes

B. 100 minutes

C. 200 minutes

D. infinite

Answer: D

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215. Half life of a first order reaction is 2 hours , what time is required for 90% of the reactant to be consumed ?

A. 199 minutes

B. 398 minutes

C. 598 minutes

D. 798 minutes

Answer: B

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216. Rate of a general reaction A + B $\rightarrow$ products can be expressed as follows on the basis of collision theory.

Rate $= Z_{AB}e^{-E_a/RT}$

Which of the following statements is not correct for the above expression?

A. Z is collision frequency and is equal to number of collision per second per unit volume of the reaction mixture

B. $e^{E_a/RT}$ is the fracation of molecules with kinetic energy equal to or greater than E_a

C. E_a is activation energy of the reaction

D. All the molecules which colloide with one other are effective collisions

Answer: D

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217. For the reaction $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$, if the rate of disappearance of NH_3 is 3.6×10^{-3} mol $L^{-1}s^{-1}$, what is the rate of formation of H_2O

A. $5.4 \times 10^{-3} molL^{-1}s^{-1}$

B. $3.6 \times 10^{-3} molL^{-1}s^{-1}$

C.

D.

Answer: A

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218. For the reaction $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$, if the rate of disappearance of NH_3 is 3.6×10^{-3} mol $L^{-1}s^{-1}$, what is the rate of formation of H_2O

A. zero $molL^{-1}S^{-1}$

B. First $molL^{-1}S^{-1}$

C. first S^{-1}

D. Zero $Lmol^{-1}S^{-1}$

Answer: A

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219. The rate of a gaseous reaction is given by the expresison $k[A]^2[B]^3$. The volume of the reaction vessel is suddenly reduced to one-half of the initial volume. The reaction rate relative to the original rate will be

A. $\frac{1}{8}a$

B. $\frac{1}{2}a$

C. $2a$

D. $32a$

Answer: D

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220. For a reaction $P + Q \rightarrow 2R + S$ which of the following statement is correct ?

A. Rate of disappearance of P = Rate of appearance of S

B. Rate of disappearance of $Q = 2 \times$ Rate of appearance of R

C. Rate of disppearance of P =Rate of appearance of Q

D. Rate of disapperance of $Q = \frac{1}{2} \times$ rate of apperance of R

Answer: B

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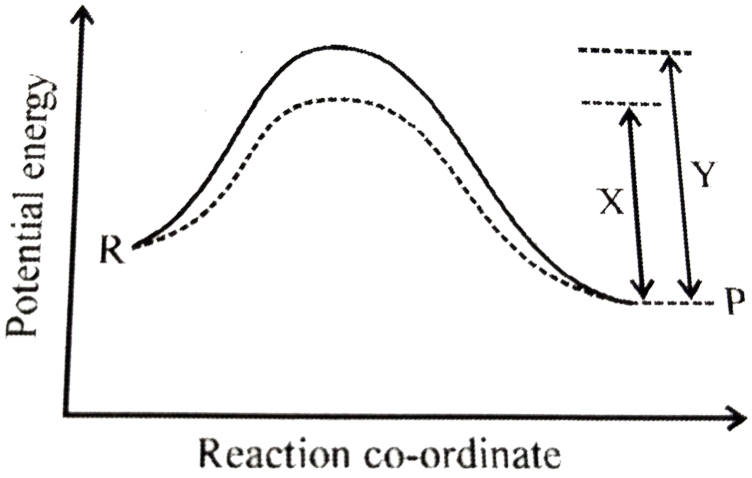
221. The graph of the effect of catalyst on activation energy is given below :



Fill up the blanks x and Y with appropriate statements.

A. X= energy of activation without catalyst

Y = energy of activation with catalyst

B. X= path of reaction with catalyst ,

Y= path of reaction without catalyst

C. X= energy of activation with catalyst ,

Y= energy of activation with out catalyst

D. X=Energy of endothermic reaction

Y= energy of exothermic reaction

Answer: C

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222. The possible mechanism for the reaction

$2NO + 2H_2 \rightarrow N_2 + 2H_2O$ is

i) $2NO < \Rightarrow N_2O_2$

ii) $N_2O_2 + H_2 \xrightarrow{\text{slow}} N_2O + H_2O$

iii) $N_2O + H_2O \xrightarrow{\text{fast}} N_2 + H_2O$

a) What is rate law for the reaction?

b) What is the order of the reaction?

A. Rate $=[N_2O_2]$, order $= 1$

B. Rate $= [N_2O_2][H_2][H_2]$order $= 2$

C. Rate $= [N_2O_2]^2$, order $= 2$

D. Rate $= [N_2O_2]^2$, order $= 3$

Answer: B

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223. For the reaction $A + B \rightarrow$ product , what will be the order or reaction with respect to A and B?

Exp.	[A] ($mol\ L^{-1}$)	[B] ($mol^{-1}\ L^{-1}$)	Initial Rate ($mol\ L^{-1}\ s^{-1}$)
1.	2.5×10^{-4}	3×10^{-5}	5×10^{-4}
2.	5×10^{-4}	6×10^{-5}	4×10^{-3}
3.	1×10^{-3}	6×10^{-5}	1.6×10^{-2}

A. 1 With respect to A and 2 with respect to B

B. 2 with respect to A and 1 with resoect to B

C. 1 with respect to A and 1 with respect to B

D. 2 with respect to A and 2 with respect toB

Answer: B

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224. Fill in the blanks by choosing the correct option .

order of the reaction is the $\underline{x}$ of the powers to which concentration terms are raised in expermentally determined rate equation . The unit of first order rate constant is $\underline{Y}$ the unit of first order rate constant when concentration is measured in terms of pressure and time in muutes is $\underline{Z}$

A. $X \rightarrow$ product $, Y \rightarrow molL^{-1}$ time $^{-1}, Z \rightarrow atm \overset{-1}{\min}$

B. $X \rightarrow$ sum $, Y \rightarrow mol^{-1}, Z \rightarrow atm \overset{-1}{\min}$

C. $x \rightarrow$ product $, Y \rightarrow Lmol^{-1}, Z \rightarrow atm \overset{-1}{\min}$

D. $x \rightarrow$ sum $, Y \rightarrow \text{time}^{-1}, Z \rightarrow \overset{-1}{\min}$

Answer: D

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225. Fill in the blanks in the following table for the reaction $X + Y \rightarrow Z$, the reaction is of first order w.r.t X and zero order w,r,t Y

Exp.	[X] (mol L^{-1})	[Y] (mol L^{-1})	Initial Rate (mol L^{-1} s^{-1})
1.	0.1	0.1	2×10^{-2}
2.	(A)	0.2	4×10^{-2}
3.	0.4	0.4	(B)
4.	(C)	0.2	2×10^{-2}

A. $A = 0.2molL^{-1}, B = 8 \times 10^{-2}molL^{-1}S^{-1}, C = 0.1molL^{-1}$

B. $A = 0.4molL^{-1}, B = 4 \times 10^{-2}molL^{-1}S^{-1}, C = 0.2molL^{-1}$

C.

$A = 0.2molL^{-1}, B = 2 \times 10^{-2}molL^{-1}S^{-1}, C = 0.4MolL^{-1}$

D.

$A = 0.4molL^{-1}, B = 2 \times 10^{\cdot} - 2)molL^{-1}S^{-1}, C = 0.4molL^{-1}$

Answer: A

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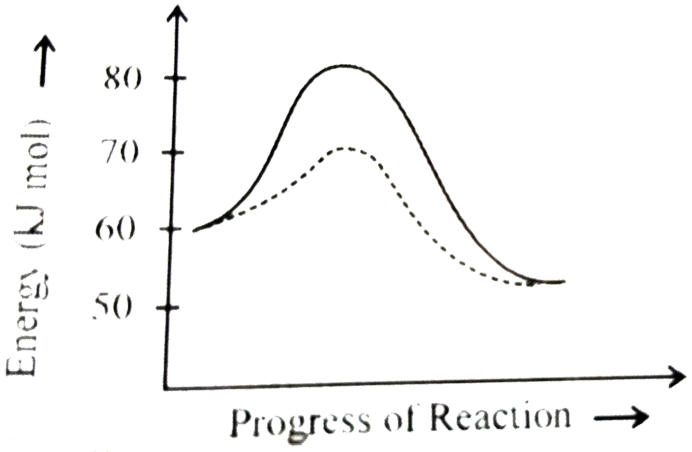
226. For a reaction $A_2 + B_2 \Leftrightarrow 2AB$ the figure shows the path of the reaction in absence and presence of a catalyst what will be the energy of activation for forward (E_f) and backward (E_b) reaction in presence of a catalyst and ΔH for the reaction gt the dotted curve is the path of reaction in presence of a catalyst .



A. $E_F = 60KJ/mol, E_b = 70KJ/mol, \Delta H = 20KJ/Mol$

B. $E_f = 20KJ/mol, E_b = 20KJ/mol, \Delta H = 50KJ/mol$

C. $E_f = 70KJ/mol, E_b = 20KJ/mol, \Delta H = -10KJ/mol$

D. $E_f = 10KJ/mol, E_b = 0KJ/Mol, \Delta H = -10KJ/mol$

Answer: D

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227. The minus sign in rate $= -\frac{d[A]}{dt}$ indicates the _____ in concentration of the _____ with time. The rate of a reaction is always _____quantity. The rate of reaction increases with _____in concentration of reactants. The blanks in the question corresponds to

A. decrease, products ,postive,increse

B. increase, reactants m negative , decrease

C. decrease , reactants , positive , increase

D. increase , products ,positive , increase

Answer: C

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228. fill up the following with suitable terms

(i) Activation energy = Threshold energy - _____

(ii) Half-life period of zero order reaction =____

(iii) Average rate of reaction = ___

(iv) Instantaneous rate of reaction

A. (i) potential energy $(ii)\ \frac{0.693}{k}$ $(iii)\ \frac{dx}{dt}$ $(iv)\ \frac{\Delta[A]}{\Delta t}$

B. (i) Energy of reactants $(ii)\ \frac{1}{k}$ $(iii)\ \frac{\Delta[A]}{\Delta t}$ $(iv)\ \frac{dx}{dt}$

C. (i) Energy of reaction $(ii)\ \frac{\log k}{t}$ $(iii)\ \frac{\Delta[A]}{\Delta t}$ $(iv)\ \frac{dx}{dt}$

D. (i) Average kinetic energy of reactants $(ii)\ \frac{a}{2k}$ $(iii)\ \frac{\Delta[A]}{\Delta t}$ $(iv)\ \frac{dx}{dt}$

Answer: D

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229. The reaction takes place in two steps as

$(i) NO_2Cl_{(g)} \xrightarrow{K_1} NO_{2(g)} + Cl_{(g)}$

$(ii) NO_2Cl_{(g)} + Cl_{(g)} \xrightarrow{K_2} NO_{2(g)} + Cl_{2(g)}$

Identify the reaction intermediate .

A. $NO_2Cl_{(g)}$

B. $NO_{2(g)}$

C. $Cl_{2(g)}$

D. $Cl_{(g)}$

Answer: D

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230. The rate constant and half - life of a first order reaction are related to each other as ____.

A. $t_{1/2} = \frac{0.693}{K}$

B. $t_{1/2} = 0.693K$

C. $K = 0.693t_{1/2}$

D. $kt_{1/2} = \frac{1}{0.693}$

Answer: A

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231. Average rate of reaction for the following reaction, $2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$ is written as

A. $\frac{\Delta[SO_2]}{\Delta t}$

B. $-\frac{\Delta[O_2]}{\Delta t}$

C. $\frac{1}{2}\frac{Detla[SO_2]}{\Delta t}$

D. $\frac{\Delta[SO_3]}{\Delta t}$

Answer: B

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232. Give one example of pseudo first order reaction.

A. inversion of cane sugar

B. Decomposition of H_2O_2

C. Conversion of cycopropane to propene

D. Decompostion of N_2O_5

Answer: A

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233. Which among the following equations represents arrhenius equation ?

A. $k = Ae^{E_a / RT}$

B. $k = A \cdot e^{RT / E_a}$

C. $K = \frac{A}{e^{E_a / RT}}$

D. $k = \frac{A}{e^{RT / E + (a)}}$

Answer: C

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234. The rate constant for a first order reaction is $7.0 \times 10^{-4} s^{-1}$. If initial concentration of reactant is 0.080 M, what is the half life of reaction ?

A. 990S

B. $79.2S$

C. $12375S$

D. $10.10 \times 10^{-4} S$

Answer: A

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Test Your Grasp

1. Chemical kinetics, a branch of physical chemistry, deals with :

A. heat changes in a reaction

B. physical changes in a reaction

C. rates of reactions

D. structure of a molecules

Answer: C

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2. The rate of chemical reaction

A. increase as the reaction proceeds

B. decreases as the reaction prodceeds

C. may increase or decrease during the reaction

D. reamains constant as the reaction proceeds

Answer: B

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3. For the hypothetical reaction $2A \rightarrow 3C$, the reaction rate r in terms of the rate of change of the concentration is given by

A. $r = -\frac{d[A]}{dt}$

B. $= -\frac{1}{2}\frac{d[A]}{dt}$

C. $r = -\frac{1}{3}\frac{d[A]}{dt}$

D. $r = \frac{d[A]}{dt}$

Answer: B

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4. The term $-dx/dt$ in the rate expresison refers to the

A. instantaneous rate of reaction

B. average rate of reaction

C. increasing in the concentration of reactants

D. comcentration of reactants

Answer: A

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5. In general, with every $10^{\circ} C$ rise in temperature, the rate of reaction becomes appproximately.....

A. ten times

B. double

C. half

D. one tenth

Answer: B

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6. The activation energy of a reaction is zero. The rate constant of the reaction

A. increases with increase in temperature

B. decreases with decrease of temperature

C. decreases with increase of temperature

D. is nearly independent of temperature

Answer: D

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7. The activation energy for a hypothetical reaction $A \to X$ is $12.49 kcal mol^{-1}$. If temperature is raised to 305 form $295K$, the reaction rate increased by $0.002 kcal L^{-1} mol^{-1}$ is almost equal to

A. 0.6

B. 1

C. 0.5

D. 0.2

Answer: B

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8. The rate constant of a reaction depends on

A. initial concentration of the reactants

B. time of reaction

C. temperature

D. extent of reaction

Answer: C

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9. Rate expression of a chemical change is $-\frac{dx}{dt} = k[A]^2[B]^1[C]^0$

The order of reaction is :

A. 3

B. 2

C. 1

D. zero

Answer: A

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10. If the rate of reaction between A and B is given by rate $= k[A][B]^2$, then the reaction is :

A. first order in A

B. second order in B

C. third order overall

D. all are correct

Answer: D

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11. The rate law for the reaction

$RCl + NaOH(aq) \rightarrow ROH + NaCl$ is given by

Rate $= k[RCl]$. The rate of the reaction will be

A. unaffected by increaing temperature of the reaction

B. doubled on doubling the concentration of NaOH

C. Halved on reducing the concentration of NAOH to one half

D. halved on reducing the concentration of RCI to one half

Answer: D

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12. A zero order reactio is one:

A. in which reactants do not react

B. in which one of the reactants is in large excess

C. whose rate increases with time

D. whose rate is uniform and not affected by time

Answer: D

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13. For which of the following reactions, the units of rate constant and rate of reaction are same?

A. first order reacation

B. zero order reaction

C. second order reaction

D. Fractional order reaction

Answer: B

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14. For a zero order reaction :

A. $t_{1/2} \propto a$

B. $t_{1/2} \propto t/a$

C. $t_{1/2} \propto a^2$

D. $t_{1/2} \propto 1/a^2$

Answer: A

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15. If the concentration is expressed in moles per liter, the unit of the rate constant for a first-order reaction is

A. $molL^{-1}\sec^{-1}$

B. $\sec^{-1}$

C. $MolL^{-1}$

D. mol^{-1}

Answer: B

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16. Which one of the following formula represents a first-order reaction?

A. $k = \frac{2.303}{t}\log_{10}\frac{[A]_t}{[A]_0}$

B. $k = \frac{1}{t}.\frac{x}{a(a-x)}$

C. $k = \frac{2.303}{t}\log_{10}\frac{a}{A-x}$

D. $k = \frac{2.303}{t}\log_{10}\frac{a}{x}$

Answer: C

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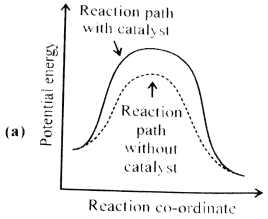
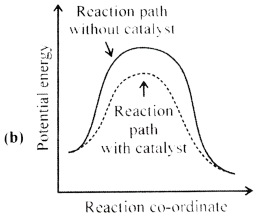
17. Which of the following is correct plot for effect of catalyst on activation energy.

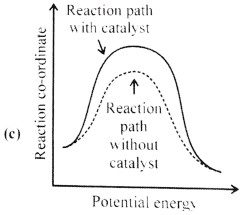
A.



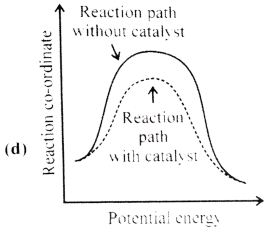
B.



C.



D.



Answer: B

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18. The specific rate constant of a first order reaction depends on the

A. concentration of the reactants

B. concentration of the products

C. time

D. temperature

Answer:

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19. The inversion of cane sugar is represented by

$C_{12}H_{22}O_{11} + H_2O \rightarrow C_6H_{12}O_6 + C_6H_{12}O_6$

It is a reaction of

A. second order

B. unimolcular

C. pseudo unimolecular

D. zero order

Answer: C

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20. Which of the following statement regarding the molecularity of a reaction is wrong ?

A. It may be either shole number of fracctional

B. it is calculated from the reaction mechanism

C. it depends on the rate determining step

D. it is number of molecules of reactants taking part in a single step chemical reaction

Answer: A

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21. Molecularity of the reaction :

A. is always a whole number

B. is never a whole number

C. can have a fractional value

D. can be zero

Answer: A

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22. A plot of log (a-x) against time 't' is a straight line. This indicates that the reaction is of :

A. zero order

B. first order

C. second order

D. third order

Answer: B

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23. If initial concentration is doubled, the time for half-reaction is also doubled, the order of reaction is

A. zero

B. first

C. second

D. third

Answer: A

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24. In pseudo-unimolecular reactions :

A. one of the reactants is present in large excess

B. both the reactants have same concentration

C. both the reactants are present in low concentration

D. one of the reactants is less reactive

Answer: A

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25. The rate of the reaction

$CCl_3CHO + NO \rightarrow CHC_3 + NO + CO$ is given by Rate

$= K[CCl_3CHO][NO]$. If concentration is expressed in moles/litre, the units of K are

A. $Mol^2L^2S^{-1}$

B. $molL^{-1}s^{-1}$

C. $Lmol^{-1}S^{-1}$

D. S^{-1}

Answer: C

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26. The rate of reaction can be increased in general by all the following factors except

A. by increasing the temperature

B. using a suitable catalyst

C. by increasing the concentration of reactants

D. by an increase in activation energy

Answer: D

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27. Radioactive disintegration is a ..... order reaction.

A. zero order reaction

B. first order reacation

C. second order reaction

D. third order reaction

Answer: B

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28. The overall rate of a reaction is governed by :

A. the rate of the fastest is governed by

B. the rate of the slowest intermediate step

C. the sum total of the rates of all the intermediate steps

D. the average of the rates of all the intermidiates steps

Answer: B

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29. The rate constant of a reaction does not depend upon:

A. temperature

B. activation energy

C. calalyst

D. concentration of reactants and products

Answer: D

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30. For first order reaction, the half life is independent of :

A. initial concentration

B. cube root of initial concentration

C. first power of initial concentration

D. square root of final concentration

Answer: A

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31. Unit of rate of reaction is

A. $moldm^{-3}time^{-1}$

B. $mol^{-1}dm^{3}time^{-1}$

C. $moldm^{-3}$time

D. $mol^{-1}dm^{-1}time^{-1}$

Answer: A

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32. Half life $\left(t_{\frac{1}{2}}\right)$ of first order reaction is

A. dependent of concentration

B. independent of concentration

C. dependent of time

D. dependent of molecularity

Answer: B

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33. Unit of first order rate constant is

A. $moldm^{-3}\text{time}^{-1}$

B. $dm^{-3}mol^{-1}\text{time}^{-1}$

C. time^{-1}

D. $mol, dm^3, \text{time}^{-1}$

Answer: C

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34. order of reaction is

A. never zero

B. never fractional

C. always equal to number of molecules taking part in reaction

D. an experimentally determined quantity

Answer: D

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35. Rate constant does not depend upon unit of concentration for reaction whose order is

A. zero

B. first

C. fractional

D. infinite

Answer: B

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36. The rate of a chemical reaction can be expressed in terms of

A. rate of consumption of catalyst

B. rate of consumption of reactants only

C. rate of consumption of reactants and formation of products both

D. rate of formation of products only

Answer: C

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37. Unit of rate of a reaction is

A. $Lmol^{-1}t^{-1}$

B. $moldm^{-3}t^{-1}$

C. Ms

D. $M^{-1}S^{-1}$

Answer: B

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38. In the reaction $A + 3B \rightarrow 2C,$ the rate of formation of C is

A. the same as rate of concentration of A

B. the same as the rate consumption of B

C. twice the rate of consumption of A

D. 3/2 times the rate of consumption of B

Answer: C

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39. The instantaneous rate of reaction $2A + B \rightarrow C + 3D$ is given by

A. $\frac{dA}{dt}$

B. $\frac{1}{2}\frac{d[A]}{dt}$

C. $\frac{d[B]}{dt}$

D. $\frac{1}{3}\frac{d[D]}{dt}$

Answer: D

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40. A reaction of first order with respect to reactant A and second order with respect to reactant B. the rate law for the reaction is given by

A. $\text{Rate} = k[A][B]^2$

B. Rate $= [A][B]^2$

C. Rate $= [A]^2[B]$

D. Rate $= k[A]^0[B]^2$

Answer: A

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41. Molecularity of an elementary reaction

A. may be zero

B. is always integral

C. may be semi - integral

D. may be integral fractional or zero

Answer: B

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42. The unit of rate constant for first order reaction is

A. $\min^{-2}$

B. s

C. s^{-1}

D. $\min$

Answer: C

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43. the integrated rate equation for first order reaction $A \rightarrow$ products is given by

A. $l = \frac{2.303}{t} ln \frac{[A_0]}{[A_t]}$

B. $k = -\frac{1}{t} ln \frac{[A_t]}{[A_0]}$

C. $k = \frac{2.303}{t} \log_{10} \frac{[A_t]}{[A_0]}$

D. $k = \frac{1}{t} ln \frac{[A_t]}{[A_0]}$

Answer: B

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44. The half life of a first order reaction is 30 min and the initial concentration of the reactant is 0.1 M . If the initial concentration of reactant is doubled ,then the half life of the reaction will be

A. 1800S

B. 60 min

C. 15 min

D. 900s

Answer: A

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45. The slope of the straight line obtained by plotting rate versus concentration of reactant in a first order reaction is

A. $-k$

B. $\frac{-k}{2.303}$

C. $\frac{k}{2.303}$

D. k

Answer: D

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46. The rate expression for a reaction is

Rate $= K[A][B]^2$

unit for rate constant K is

A. $moldm^{-3}\sec^{-1}$

B. $\left(dm^3 mol^{-1}\right)^2 \sec^{-1}$

C. $\left(dm^3 mol^{-1} \sec^{-1}\right)^2$

D. $dm^3 mol^{-1} \sec^{-1}$

Answer: B

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47. For the reaction , the concentration of the reactant was reduced from 0.1 M to 0.05 M in 6 hrs . And from 0.05 M to 0.025 in 12 hrs. the order of reaction is

A. zero

B. first

C. second

D. third

Answer: B

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48. the velocity of a reaction with molar concentration of each of the reactants is unity is called

A. Rate constant

B. specific reaction rate

C. Rate of reaction

D. Both (a) and (b)

Answer: D

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49. The unit of rate constant and rate of a reaction are same for

A. zero order

B. first order

C. second order

D. none of these

Answer: A

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50. The activation energy of a reaction can be determined by

A. Changing concentration of reactants

B. knowing rate constant at two different temperature

C. knowing rate at 298 K

D. knowing concentration of reactants at 298 K

Answer: B

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