RAVI MATHS TUITION CENTER, NEAR VILLIVAKKAM RLY STATION, CHENNAI – 82.
WHATSAPP - 8056206308

Chemical Kinetics

12th Standard

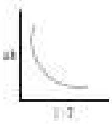
Chemistry

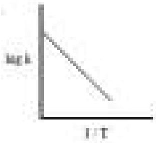
Exam Time : 02:05:00 Hrs　　Total Marks : 125

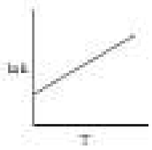
1) For a first order reaction A ⟶ B the rate constant is x min^{-1}. If the initial concentration of A is 0.01M , the concentration of A after one hour is given by the expression.
(a) 001. e^{-x}　(b) $1 \times 10^{-2}(1-e^{-60x})$　(c) $(1\times10^{-2})e^{-60x}$　(d) none of these

2) A zero order reaction X ⟶ XProduct, with an initial concentration 0.02M has a half life of 10 min. if one starts with concentration 0.04M, then the half life is
(a) 10 s (b) 5 min (c) 20 min (d) cannot be predicted using the given information

3) Among the following graphs showing variation of rate constant with temperature (T) for a reaction, the one that exhibits Arrhenius behavior over the entire temperature range is

(a) 

(b) 

(c) 

(d) both (b) and (c)

4) For a first order reaction A ⟶ product with initial concentration x mol L^{-1}, has a half life period of 2.5 hours. For the same reaction with initial concentration $\left(\frac{x}{2}\right)$ mol L-1 the half life is
(a) (2.5 x 2) hours　(b) $\left(\frac{2.5}{2}\right)$ hours　(c) 2.5 hours　(d) Without knowing the rate constant, $t_{1/2}$ cannot be determined from the given data

5) For the reaction, $2NH_3 \longrightarrow N_2 + 3H_2$, if $\frac{-d[NH_3]}{dt}$ $=k_1[NH_3]$, $\frac{d[N_2]}{dt} = k_2[NH_3]$, $\frac{d[H_2]}{dt}$ $=k_3[NH_3]$ then the relation between k_1, k_2 and k_3 is
(a) $k_1=k_2=k_3$　(b) $k_1=3k_2=2k_3$　(c) $1.5k_1=3k_2=k_3$　(d) $2k_1=k_2=3k_3$

6) The decomposition of phosphine (PH3) on tungsten at low pressure is a first order reaction. It is because the (NEET)
(a) rate is proportional to the surface coverage　(b) rate is inversely proportional to the surface coverage　(c) rate is independent of the surface coverage　(d) rate of decomposition is slow

7) For a reaction Rate = kacetone[]32 then unit of rate constant and rate of reaction respectively is
(a) $(mol\ L^{-1}\ S^{-1})$, $(mol^{1/2}L^{1/2}S\text{-}1)$　(b) $(mol^{-1/2}L^{1/2}s^{-1})$, $(mol\ L^{-1}s^{-1})$　(c) $(mol^{1/2}L^{1/2}s^{-1})$, $(molL^{-1}s^{-1})$　(d) $(molLs^{-1})$, $(mol^{1/2}L^{1/2}s)$

8) The addition of a catalyst during a chemical reaction alters which of the following quantities? (NEET)
(a) Enthalpy　(b) Activation energy　(c) Entropy　(d) Internal energy

9) Consider the following statements :
(i) increase in concentration of the reactant increases the rate of a zero order reaction.
(ii) rate constant k is equal to collision frequency A if $E_a = 0$
(iii) rate constant k is equal to collision frequency A if $E_a =0$
(iv) a plot of ln (k) vs T is a straight line.
(v) a plot of ln (k) vs $\left(\frac{1}{T}\right)$ is a straight line with a positive slope.

Correct statements are
(a) (ii) only　(b) (ii) and (iv)　(c) (ii) and (v)　(d) (i), (ii) and (v)

10) In a reversible reaction, the enthalpy change and the activation energy in the forward direction are respectively −x kJ mo^{l-4} and kJ mol^{-1} Therefore , the energy of activation in the backward direction is
(a) (y-x)kJ $mol\text{-}^{1}$　(b) (x+y)J mol^{-1}　(c) (x-y)KJ mol^{-1}　(d) $(x+y)X10^3Jmol^{-1}$

11) What is the activation energy for a reaction if its rate doubles when the temperature is raised from 200K to 400K? (R = 8.314 JK-1mol^{-1})
(a) 234.65 kJ mol^{-1} K^{-1}　(b) 434.65 kJ mol^{-1} K^{-1}　(c) 434.65 J mol^{-1} K^{-1}　(d) 334.65 J mol^{-1} K^{-1}

12) For a first order reaction, the rate constant is 6.909 min^{-1}.the time taken for 75% conversion in minutes is
(a) $\left(\frac{3}{2}\right) log^2$　(b) $\left(\frac{2}{3}\right) log2$　(c) $\left(\frac{3}{2}\right) log\left(\frac{3}{4}\right)$　(d) $\left(\frac{2}{3}\right) log\left(\frac{4}{3}\right)$

13) In a first order reaction $x \longrightarrow y$ if k is the rate constant and the initial concentration of the reactant x is 0.1M, then, the half life is

(a) $\left(\frac{log2}{k}\right)$ (b) $\left(\frac{0.693}{(0.1)k}\right)$ (c) $\left(\frac{In2}{k}\right)$ (d) none of these

14) Predict the rate law of the following reaction based on the data given below

$2A + B \longrightarrow C + 3D$

Reaction number	**[A] (min)**	**[B] (min)**	**Initial rate (M s^{-1})**
1	0.1	0.1	x
2	0.2	0.1	2x
3	0.1	0.2	4x
4	0.2	0.2	8x

(a) rate=k$[A]^2[B]$ (b) rate=k$[A][B]^2$ (c) rate=k[A][B] (d) rate=k$[A]^{1/2}[B]^{1/2}$

15) **Assertion:** rate of reaction doubles when the concentration of the reactant is doubles if it is a first order reaction.

Reason: rate constant also doubles

(a) Both assertion and reason are true and reason is the correct explanation of assertion. (b) Both assertion and reason are true but reason is not the correct explanation of assertion. (c) Assertion is true but reason is false (d) Both assertion and reason are false.

16) The rate constant of a reaction is 5.8X10^{-2}. The order of the reaction is

(a) First order (b) zero order (c) Second order (d) Third order

17) For the reaction $N_2O_5\,(g) \longrightarrow 2NO_2\,(g) + \frac{1}{2}O_2\,(g)$ value of rate of disappearance of $N_2O_5$is given as 6.5X10-^{2} mol$L^{-1}s^{-1}$ The rate of formation of NO_2 and O_2 is given respectively as

(a) (3.25X10^{-2} mol $L^{-1}S^{-1}$) and (1.3 X 10^{-2} mol $L^{-1}s^{-1}$) (b) (1.3X10^{-2} mol $L^{-1}s^{-1}$) and (3.25 X10^{-2} mol $L^{-1}s^{-1}$) (c) (1.3X10^{-1} mol $L^{-1}s^{-1}$) and (3.25 X10-2 mol $L^{-1}s^{-1}$) (d) None of these

18) During the decomposition of H_2O_2 to give dioxygen, 48 g O_2 is formed per minute at certain point of time. The rate of formation of water at this point is

(a) 0.75 mol min^{-1} (b) 1.5 mol min^{-1} (c) 2.25 mol min^{-1} (d) 3.0 mol min^{-1}

19) If the initial concentration of the reactant is doubled, the time for half reaction is also doubled. Then the order of the reaction is

(a) Zero (b) one (c) Fraction (d) none

20) In a homogeneous reaction $A \longrightarrow B + C + D$ the initial pressure was P_0 and after time t it was P. expression for rate constant in terms of P_0, P and t will be

(a) $k = \left(\frac{2.303}{t}\right) log \left(\frac{2P_0}{3P_0 - P}\right)$ (b) $k = \left(\frac{2.303}{t}\right) log \left(\frac{2P_0}{P_0 - P}\right)$ (c) $k = \left(\frac{2.303}{t}\right.$

21) If 75% of a first order reaction was completed in 60 minutes , 50% of the same reaction under the same conditions would be completed in

(a) 20 minutes (b) 30 minutes (c) 35 minutes (d) 75 minutes

22) The half life period of a radioactive element is 140 days. After 560 days , 1 g of element will be reduced to

(a) $\left(\frac{1}{2}\right) g$ (b) $\left(\frac{1}{4}\right) g$ (c) $\left(\frac{1}{8}\right) g$ (d) $\left(\frac{1}{16}\right) g$

23) The correct difference between first and second order reactions is that (NEET)

(a) A first order reaction can be catalysed; a second order reaction cannot be catalysed. (b) The half life of a first order reaction does not depend on [A0]; the half life of a second order reaction does depend on [A0]. (c) The rate of a first order reaction does not depend on reactant concentrations; the rate of a second order reaction does depend on reactant concentrations. (d) The rate of a first order reaction does depend on reactant concentrations; the rate of a second order reaction does not depend on reactant concentrations.

24) After 2 hours, a radioactive substance becomes $\left(\frac{1}{16}\right)^{th}$ of original amount Then the half life (in min) is

(a) 60 minutes (b) 120 minutes (c) 30 minutes (d) 15 minutes

25)  This reaction follows first order kinetics. The rate constant at particular temperature is 2.303X10^{-2} hour^{-1} The initial concentration of cyclopropane is 0.25 M. What will be the concentration of cyclopropane after 1806 minutes? (log 2 = 0.3010)

(a) 0.125 M (b) 0.215 M (c) 0.25 X 2.303 M (d) 0.05 M

26) $2N_2O_5 \longrightarrow NO_2 + O_2, \frac{d[N_2O_5]}{dt} = k_1[N_2O_5], \frac{d[NO_2]}{dt} = k_2[N_2O_5]$ and $\frac{dO_2}{dt} = k_3[N_2O_5]$, the relation between k_1, k_2 and k_3 is

(a) $2k_1 = 4k_2 = k_3$ (b) $k_1 = k_2 = k_3$ (c) $2k_1 = k_2 = 4k_3$ (d) $2k_1 = k_2 = k_3$

27) What would be the rate of disappearance of oxygen, if the rate of formation of nitric oxide (NO) is 3.6 xl0^{-3}mol L^{-1} s^{-1}?

(a) 4 x10^{-3}mol L^{-1}s^{-1} (b) 4 x10^{-3}mol^{-1} L^{-1}s^{-1} (c) 4.5 x 10^{-3}mol L^{-1}s^{-1} (d) 4.5 x 10^{-3}mol^{-1} L^{-1}s^{-1}

28) For a reaction, $2A + B \longrightarrow 3C$, The rate of appearance of C at time 't' is 1.2 x 10^{-4} mol L^{-1}s^{-1}. Identify the rate of reaction.

(a) 4 x10^{-5}mol L^{-1}s^{-1} (b) 4.5 x 10^{-1}mol L^{-1}s^{-1} (c) 3.6 x 10^{-4} mol L^{-1}s^{-1} (d) None of these

29) For the reaction, $2N_2O_5 \longrightarrow 4 NO_2+O_2$, select the correct statement.

(a) Rate of formation of O_2 is same as rate of formation of NO_2
(b) Rate of disappearance of N_2O_5 is two times the rate of formation of NO_2.
(c) Rate of formation of O_2 is 0.5 times rate of disappearance of N_2O_5
(d) Rate of formation of NO_2 is equal to rate of disappearance of N_2O_5

30) In pseudo-order reactions

(a) The actual order of reaction is different from that expected using rate law expression
(b) The concentration of at least one reactant is taken in large excess.
(c) The concentration of reactant taken in excess may be taken as constant of
(d) All these

31) The depletion of ozone involves the following steps:

Step 1: $O_2 + O \underset{k_2}{\overset{k_1}{\rightleftharpoons}} O_3$ (fast)

Step 2: $O_3 + O \xrightarrow{k} 2O_2$ (slow)

The predicted order of the reaction will be

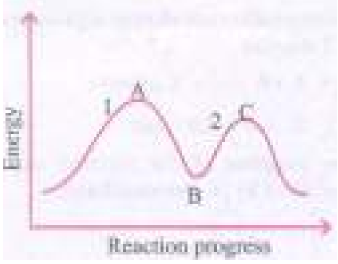
(a) I (b) II (c) III (d) Zero

32) What would be the activation energy of a reaction when the temperature is increased from 27°C to 37°C?

(a) 534 kJ mol^{-1} (b) 53.4 kJ mol^{-1} (c) 5.34 kJ mol^{-1} (d) None of these

33) $A+B \longrightarrow C$; ΔH = 60 kJ mol^{-1} Ea_f = 150 kJ. What is the activation energy of the backward reaction?

(a) 210 kJ (b) 105 kJ (c) 90 kJ (d) 145 kJ

34) 

(a) It is a 2 steps reaction, step 1 is slower than step 2
(b) It is a 2 steps reaction, step 2 is slower than step 1.
(c) Single step reaction where B is a activated complex
(d) Single step reaction in which B is a reaction intermediate.

35) The Unit of rate constant and rate of reaction are same for

(a) First order (b) second order (c) Third order (d) zero order

36) Which of the following does not affect the rate of reaction?

(a) Amount of the reactant taken (b) Physical state of the reactant (c) ΔH of reaction (d) Size of vessel

37) Which of the following statement is not correct?

(a) Molecularity of a reaction cannot be fractional
(b) Molecularity of a reaction cannot be more than three
(c) Molecularity of a reaction can be zero
(d) Molecularity is assigned for each elementary step of mechanism.

38) Which order reaction obeys the expression $t_{\frac{1}{2}} \alpha \frac{1}{[A]}$?

(a) First (b) Second (c) Third (d) Zero

39) For an exothermic chemical process occurring in 2 steps as

(i) $A + B \longrightarrow X$ (slow) ;

(ii) X ⟶ AB (fast)

The progress of the reaction can be best described by (x- intermediate).

(a) 

(b) 

(c) 

(d) None of these

40) The graph between. the log K verrus $\frac{1}{T}$ is a straight line. The slope of the line is

(a) $\frac{-2.303R}{Ea}$ (b) $\frac{Ea}{2.303R}$ (c) $\frac{2.303R}{Ea}$ (d) $\frac{Ea}{2.303R}$

41) Nitric oxide (NO) reacts wtih oxygen to produce nitrogen dioxide

$2NO_{(g)} + O_{2(g)} \longrightarrow 2NO_{2(g)}$

If the mechanism of reaction is

$NO + O_2 \overset{K}{\rightleftharpoons} NO_3$ (fast)

$NO_3 + NO \overset{K_1}{\rightleftharpoons} NO_2 + NO_2$ (slow)

(a) Rate = K' [NO] $[O_2]$ (b) Rate = K' [NO] $[O_2]_2$ (c) Rate = K' $[NO]^2$ $[O_2]$ (d) Rate = K' $[NO]^3$ $[O_2]$

42) The addition of a catalyst during a chemical reaction alters which of the following quantities?

(a) Activation energy (b) Entropy (c) Internal energy (d) Enthalpy

43) A reaction having equal activation energies for forward and reverse reactions has

(a) $\Delta G = 0$ (b) $\Delta H = 0$ (c) $\Delta H = \Delta G = \Delta S = 0$ (d) $\Delta S = 0$

44) The given reaction

$2\ FeCl_3 + SnCl_2 \longrightarrow 2FeCl_2 + SnCl_4$ is an example of

(a) I order (b) II order (c) III order (d) None of these

45) Enzymes increase the rate of reactions.

(a) By lowering activation energy (b) By increasing activation energy (c) By changing equilibrium constant (d) By forming enzyme substrate complex

46) Activation energy of a chemical reaction can be determined by

(a) Evaluating rate constants at two different temperatures (b) Evaluating velocities of reaction at two different temperatures (c) Evaluating rate constant at standard temperature (d) Changing concentration of reactants

47) 2A ⟶ B + C. It would be a zero order reaction when

(a) The rate of reaction is proportional to square of cone. of A (b) The rate of reaction remains same at any conc.of A. (c) The rate of remains unchanged at any cone. of B and C (d) The rate of reaction doubles if cone. of B is increased to double.

48) What will be the rate constant of a I order reaction if its half life is given to be 20 min?

(a) 13.86 min^{-1} (b) 28.86 min^{-1} (c) 3.47×10^{-2} min^{-1} (d) None of these

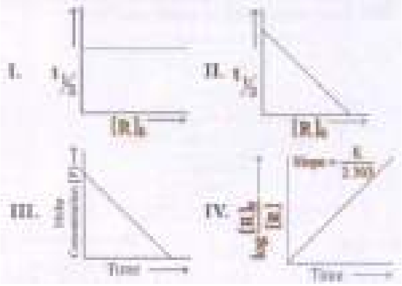
49) How much time will be taken for 20 gm to reduce 5 g? [R = $2 \times 10^{-3} s^{-1}$ (I order reaction)]

(a) 693.1 s (b) 693.1 s^{-1} (c) 6.931 s (d) 6.931 s^{-1}

50) For the following reaction, identify the order of reaction and dimension of the rate constant.

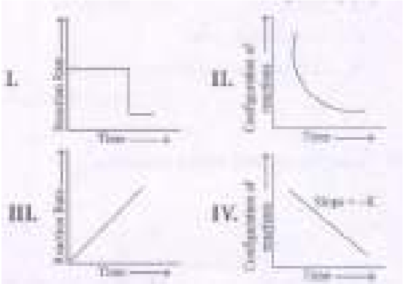
$H_2O_{2(aq)} + 3I^-_{(aq)} + 2H^+ \longrightarrow 2H_2O_{(1)} + I_3^-$; Rate = $k[H_2O_2]\ [I]^-$

(a) 2, L mol^{-1} s^{-1} (b) 1. s^{-1} (c) $\frac{3}{2}$, $L^{1/2}$ $mol^{-1/2}$ s^{-1} (d) None of these

51) 

Which of the above graphs is correct for first order reactions?

(a) I, II (b) II, III (c) I, IV (d) I, III

52) 

Which of the above graphs is correct for zero order reactions?
(a) I, II (b) I, III (c) I, IV (d) II, III

53) During decomposition of an activated complex
(a) energy is always released (b) energy is always absorbed (c) energy does not change (d) products may be formed.

54) A first order reaction is 50% completed in 1.26 x 10^{14}. How much time would is take for 100% completion?
(a) 1.26 X 10^{15} s (b) 2.52 X 10^{14} s (c) 2.52 X 10^{28} s (d) Infinite

55) Concentration is expressed in?
(a) $\frac{number\ of\ moles/litre}{time\ in\ sec}$ (b) $\frac{time\ in\ sec}{number\ of\ moles/litre}$ (c) $\frac{number\ of\ moles/litre}{volume}$ (d) $\frac{volume}{number\ of\ moles/litre}$

56) During a chemical reaction, the concentration of reaction
(a) increases (b) decreases (c) remains constant (d) first increases and then decreases

57) For the second order reaction $t_{\frac{1}{2}} \alpha$
(a) $\frac{1}{a^2}$ (b) $\frac{1}{a}$ (c) Constant (d) a

58) The unit of zero order rate constant is
(a) litre mol^{-1} sec^{-1} (b) mol $litre^{-1}$ sec^{-1} (c) sec^{-1} (d) $litre^2$ sec^{-1}

59) The excess energy which a molecule must possess to become active is known as
(a) kinetic energy (b) threshold energy (c) potential energy (d) activation energy

60) Arrhenius equation is
(a) $k = Ae^{-1/RT}$ (b) $k = Ae^{RT/E_a}$ (c) $k = Ae^{-E_a/RT}$ (d) $k = Ae^{E_a/RT}$

61) The term A in Arrhenius equation is called as
(a) Probability factor (b) Activation energy (c) Collision factor (d) Frequency factor

62) The half life period of a first order reaction is 10 minutes. Then its rate constant is
(a) 6.93X 10^2 min^{-1} (b) 0.693X 10^{-2} min^{-1} (c) 6.932X 10^{-2} min^{-1} (d) 69.3X 10^{-1} min^{-1}

63) For a reaction: aA ⟶ bB, the rate of reaction is doubled when the concentration of A is increased by four times. The rate of reaction is equal to
(a) $k[A]^a$ (b) $k[A]^{\frac{1}{2}}$ (c) $k[A]^{\frac{1}{a}}$ (d) K[A]

64) Compound A reacts by first order kineties. At 25°C, the rate constant of the reaction is 0.60 see:'. What is the half life of A?
(a) 1.15 sec (b) 0.4158 sec (c) 0.093 sec (d) 1.29 sec

65) Pick out the odd one.

(a) ${}_{92}U^{238} \longrightarrow {}_{90}Th^{234} + {}_{2}He^{4}$ (b) $SO_2Cl_2 \longrightarrow SO_2 + Cl_2$ (c) $CH_3COOCH_3 + H_2O \xrightarrow{H^+} CH_3COOH + CH_3OH$ (d) $C_{12}H_{22}O_{11} + H_2O \xrightarrow{H^+} C_6H_{12}O_6 + C_6H_{12}O_6$

66) If the initial concentration of the reactants is doubled, then rate
(a) remains constant (b) doubled (c) is reduced to half of its value (d) is increased by four times of initial rate

67) The rate of a reaction is expressed as $k[A]_2[B]^1$, the reaction is said to be
(a) second order with respect to A (b) first order with respect to B (c) overall order of the reaction is third order (d) all the above

68) Which one of the following is an example of pseudo first order reaction?
(a) Acid hydrolysis of ester (b) Decomposition of HI (c) Synthesis of NH_3 (d) All radioactive transformations

69) The rate constant of a first order reaction is 2.0 x 10^{-6} s^{-1}. The initial concentration of the reactant is 0.10 mol dm^{-3} . What is the I value of the initial rate?
(a) 2.0 x 10^{-7} mol dm^{-3} s^{-1} (b) 2.0 x 10^{-6} mol dm^{-3} s^{-1} (c) 2.0 x 10^{-5} mol dm^{-3} s^{-1} (d) 2.0 x 10^7 mol dm^{-3} s^{-1}

70) If the activation energy is high) then the rate of the reaction is
(a) high (b) moderate (c) low (d) cannot be predicted

71) Pick out the effect of catalyst on activation energy?
(a) Catalyst lowers the (b) Catalyst provides alternate (c) Both (a) (d) None of

activation energy path to the reaction and (b) these

72) In Arrhenius equation, if EA is positive and $T_2 > T_1$, then ____________
(a) $k_1 = k_2$ (b) $k_2 < k_1$ (c) $k_1 = \frac{1}{k_2}$ (d) $k_2 > k_1$

73) For the reaction A ⟶ 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 = $[A]^n$. The value of n is ____________
(a) 1 (b) 2 (c) 0 (d) 3

74) In the graph showing Maxwell, Boltzmann distribution of energy ______________
(a) area under the curve must not change with increase in temperature.
(b) area under the curve increases in temperature.
(c) area under the curve decreases with increase in temperature.
(d) None of these above

75) For a complex reaction ______________
(a) Order of overall reaction is same as molecularity of the slowest step.
(b) Order of overall reaction is less than the molecularity of the slowest step.
(c) Order of overall reaction is greater than molecularity of the slowest step.
(d) None of these above.

76) In any unimolecular reaction ______________
(a) Only two reacting species is involved in the rate determining step.
(b) The order and the molecularity of slowest step are equal to one.
(c) The molecularity of the reaction is one and order is zero.
(d) Both molecularity and order of the reaction are one.

77) Rate law cannot be determined from balanced chemical equation if ____________
(a) Reverse reactions is not involved
(b) It is an elementary reaction
(c) It is a sequence of elementary reactions
(d) All of the reactants is in excess. Rate law can be determined from balanced chemical equation if it is an elementary reaction.

78) The value of rate constant of a pseudo first order reaction_______________
(a) Independent on the concentration of reactants present in small amount
(b) Depends on the concentration of reactants present in excess
(c) Independent of the concentration of reactants
(d) Depends only on temperature.

79) $CH_3COOCH_3 + H_2 OH \xrightarrow{H^+} CH_3 COOH + CH_3 OH$ is an example of ____________ order reaction.
(a) first (b) zero (c) third (d) pseudo

80) When the E_a of a reaction zero then the rate constant of the reaction is equal to __________
(a) 2.303 K (b) $\frac{K}{2.303}$ (c) $\left(t_{\frac{1}{2}}\right)$ (d) A

81) By the order of reaction we mean ______________
(a) the sum of powers to which the concentration terms are raised in the rate equation
(b) the number of reactants take part in the reaction
(c) the number of concentration terms in the velocity equation for the reaction
(d) the least number of product molecule needed for the reaction

82) The oxidation of potassium iodide by potassium persulphate as per the rate law, rate $k[K_2S_2O_8]$ [K1]. The order with respect to potassium iodide is, __________
(a) two (b) one (c) three (d) four

83) If the rate law for a reaction A + B ⟶ is $C\frac{d[A]}{dt} \times \frac{1}{2}$ = k $[A]^n$ $[B]^m$ then the order of a reaction is ______________
(a) n (b) m (c) n + m (d) m - n

84) For a reaction 2A + B ⟶ 3C, express the rate of reaction in terms of formation of the product _____________
(a) $\frac{1}{2}\frac{d[A]}{dt}$ (b) $\frac{-1}{3}\frac{d[C]}{dt}$ (c) $\frac{1}{3}\frac{d[C]}{dt}$ (d) $\frac{-1}{2}\frac{d[B]}{dt}$

85) Energy of activation of a reactant is reduced by ___________
(a) reduced pressure (b) increased pressure (c) reduced temperature (d) increased temperature

86) Activation energy is equal to _____________
(a) Threshold energy + Energy of colloding molecules
(b) Threshold energy
(c) Threshold energy x Energy of colloiding molecules
(d) Threshold energy - Energy of colloiding molecules

87) For the reaction $N_{2(g)} + 3H_{2(g)} \longrightarrow 2NH_{3(g)}$ the rate of the reaction in terms of ammonia is __________________
(a) $+\frac{1}{2}\frac{-d[NH_3]}{dt}$ (b) $-\frac{1}{2}\frac{d[NH_3]}{dt}$ (c) $\frac{-d[NH_3]}{dt}$ (d) $\frac{+d[NH_3]}{dt}$

88) The magnitude of order of a reaction may be _____________

(a) fractional (b) zero (c) integral values (d) all of these

89) For a reaction, E_a = 0 and k = 4.2 x l0^5 sec^{-1} at 300 K, the value of kat 310 Kwill be ______________

(a) 4.2 x 10^5 sec^{-1} (b) 8.4 x 10^5 sec^{-1} (c) 8.4 x 10^5 sec^{-1} (d) unpredictable

90) For an elementary reaction, its order is never ___________ since it is a ______________ step process.

(a) integral, single (b) fractional, single (c) zero, one (d) fractional, zero

91) In the acid hydrolysis of an ester, what is the time taken for complete hydrolysis?

(a) 8 hours (b) 45 minutes (c) both (a) and (b) (d) None

92) $CH_3COOCH_3 + H_2O \xrightarrow{H^+} CH_3COOH + CH_3OH$ is an example of _______ order reaction.

(a) first (b) zero (c) third (d) pseudo

93) The minimum energy that all colliding molecules must possess so as to make the collisions more effective and successful is_____________

(a) activation energy (b) colliding energy (c) threshold energy (d) kinetic energy

94) For a general reaction aA + bB ⟶Products, the rate of the reaction is equal to_____________.

(a) $k[A]^p\,[B]^q$ (b) k [A] [B] (c) k (d) $\frac{1}{k}$

95) The time required for 50%completion of the reaction is known as ___________

(a) Average life period (b) Half-life period (c) Rate (d) None of these

96) In a second order reaction, if one of the concentration is excess, the order of the reaction is _______________ order reaction.

(a) first (b) pseudo first (c) third (d) zero

97) The half-life period of a first order reaction is 69.3 seconds. Its rate constant is _______________.

(a) 10^{-2} s^{-1} (b) 10^{-4} s^{-1} (c) 10 s^{-1} (d) 10^2 s^{-1}

98) If [A] is the concentration of A at any time t and [A_o]is the concentration at t = 0, then for the first order reaction, the rate equation can be written as _________

(a) $k = \frac{2.303}{t}\log\left[\frac{A}{A_0}\right]$ (b) $k_t = 2.303\log\left[\frac{A_0}{[A]}\right]$ (c) $k = 2.303\log\left[\frac{A_0}{[A_0]-[A]}\right]$ (d) $k = \frac{2.303}{t}\log$

99) All radioactive transformations follow________ order kinetics.

(a) zero (b) first (c) second (d) third

100) Activation energy of a reactant is reduced by _________________

(a) increased temperature (b) reduced temperature (c) increased pressure (d) reduced pressure

Match the following

101) Arrhenius	(1) pseudo first order
102) $N_2O_{5(g)} \longrightarrow 2NO_{2(g)} + \frac{1}{2}\ O_{2(g)}$	(2) 1
103) $CH_3COCH_3 + I_2 \xrightarrow{H} ICH_2\,COCH_3 + HI$	(3) $k = Ae^{-\left(\frac{Ea}{RT}\right)}$
104) $2HI \longrightarrow H_2I_2$	(4) 0
105) $CH_3COOCH_{3(aq)} + H_2O \xrightarrow{H} CH_3COOH_{(aq)} + CH_3OH_{(aq)}$	(5) 2
106) Pseudo first order reaction	(6) involves at least two reactants

Assertion and reason

107) Assertion: If temperature does not affect the rate of reaction, Ea = 0.

Reason: Lesser the activation energy, slower will be the reaction

a) Both assertion and reason are true and the reason is the correct explanation of the assertion.

b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.

c) Assertion is true but reason is false.

d) Both assertion and reason are false.

108) Assertion: A positive catalyst increases the rate of reaction.

Reason: A positive catalyst alters reaction mechanism and decreases activation energy.

a) Both assertion and reason are true and the reason is the correct explanation of the assertion.

b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.

c) Assertion is true but reason is false.

d) Both assertion and reason are false.

109) Assertion: Order and molecularity of a reaction are always equal.
Reason: Complex reactions takes place in steps and fastest step determine the molecularity of reaction
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

110) Assertion: Hydrolysis of ester in acidic medium follows pseudo first order kinetics.
Reason: Hydrolysis of ester is independent of the concentration of acid used
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

111) Assertion: In presence of positve catalyst, activation energy & threshold energy decreases.
Reason: Minimum energy required to permit a reaction is known as threshold energy.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

112) Assertion: Rate constant determined from Arrhenius equation are fairly, accurate for simple as well as complex molecule.
Reason: Reactant molecules undergo chemical change irrespective of their orientation during collision.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

113) Assertion: All collision of reactant molecule lead to product formation.
Reason: Product formation is independent of orientation of the reactant molecules.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

114) Assertion: The enthalpy of reaction remains constant in the presence of a catalyst.
Reason: A catalyst participating in the reaction forms a different activated complex and lowers down the activation energy of reactant and product remains the same.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

115) Assertion: Order and molecularity are same.
Reason: Order is determined experimentally and molecularity is the sum of the stoichiometric coefficient of rate determining elementary step.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

116) Assertion: Order of the reaction zero or fractional.
Reason: We cannot determine order from balanced chemical equation.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

117) Assertion: Rate constant of zero order reaction has same units as the rate of reaction.
Reason: Rate constant of zero order reaction does not depend upon unit of concentration.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

118) Assertion: The order of reaction can have fractional value.
Reason: Order cannot be determined from a stiochiometrically balance equation.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

119) Assertion: A catalyst is a substance which alters the rate of a reaction. Reason: In the presence of catalyst the energy of activation is increased.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

120) Assertion: Hydrolysis of methyl acetate by HCl is a pseudo first order reaction.
Reason: HCl is used as catalyst in the above reaction.
a) Both assertion and reason are true and the reason is the correct explanation of the assertion.
b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but reason is false.
d) Both assertion and reason are false.

Find the wrong statement

121) Mark the incorrect statements.
a) Catalyst provides an alternative pathway, to reaction mechanism.
b) Catalyst raises the activation energy.
c) Catalyst lowers the activation energy.
d) Catalyst not alters enthalpy change of the reaction.

122) Consider the following statements and identify the incorrect statement(s).
(i) Decomposition of H_2O_2 is an II order reaction
(ii) $t_{1/u}$ is independent of initial concentration of a reaction.
(iii) Fractional order reactions are observed depending on their rates.
(iv) Rate = k $[A]^p$ $[B]^q$; p + q = order.
a) only (ii)
b) both (ii) and (iii)
c) only (i)
d) None of these

123) a) The rate of a reaction increase with increasing temperature.
b) The rate of a reaction increases with the increase in the concentration of the reactants
c) Gas phase reactions are slower than reactions involving solid reactants
d) The rate of a reaction is affected by the surface area of the reactant.

124) About "Collision theory"
a) Collision theory used to predict the rates of chemical reactions for gases.

b) This theory is based on the kinetic theory of gases
c) Chemical reactions occur as a result of collision between the reacting molecules
d) Decrease in concentration of the reactant brings about more collisions.

125) a) Rate of a reaction depends on the initial concentration of reactants
b) Rate constant of a reaction does not depend on the initial concentration of reactants
c) Concentration and surface area decreases the number of collision
d) The molecularity of a reaction is the no. of molecules or ions that participate in the rate determining step.

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