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प्रश्नपुस्तिका क्रमांक
Question Booklet No.

O.M.R. Serial No. | | | | | | | | |

प्रश्नपुस्तिका सीरीज
Question Booklet Series
A

M.Sc Industrial Chemistry (First Semester) Examination, February/March-2022

MSIC-104

Physical Chemistry

Time : 1:30 Hours **Maximum Marks-100**

जब तक कहा न जाय, इस प्रश्नपुस्तिका को न खोलें

निर्देश : –

1. परीक्षार्थी अपने अनुक्रमांक, विषय एवं प्रश्नपुस्तिका की सीरीज का विवरण यथास्थान सही– सही भरें, अन्यथा मूल्यांकन में किसी भी प्रकार की विसंगति की दशा में उसकी जिम्मेदारी स्वयं परीक्षार्थी की होगी।
2. **इस प्रश्नपुस्तिका में 100 प्रश्न हैं, जिनमे से केवल 75 प्रश्नों के उत्तर परीक्षार्थियों द्वारा दिये जाने है। प्रत्येक प्रश्न के चार वैकल्पिक उत्तर प्रश्न के नीचे दिये गये हैं। इन चारों में से केवल एक ही उत्तर सही है। जिस उत्तर को आप सही या सबसे उचित समझते हैं, अपने उत्तर पत्रक (O.M.R. ANSWER SHEET)में उसके अक्षर वाले वृत्त को काले या नीले बाल प्वांइट पेन से पूरा भर दें। यदि किसी परीक्षार्थी द्वारा निर्धारित प्रश्नों से अधिक प्रश्नों के उत्तर दिये जाते हैं तो उसके द्वारा हल किये गये प्रथमतः यथा निर्दिष्ट प्रश्नोत्तरों का ही मूल्यांकन किया जायेगा।**
3. प्रत्येक प्रश्न के अंक समान हैं। आप के जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
4. सभी उत्तर केवल ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर ही दिये जाने हैं। उत्तर पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
5. ओ०एम०आर० उत्तर पत्रक **(O.M.R. ANSWER SHEET)** पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाय।
6. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी प्रश्नपुस्तिका बुकलेट एवं ओ०एम०आर० शीट पृथक–पृथक उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें।
7. निगेटिव मार्किंग नहीं है।

महत्वपूर्ण : – **प्रश्नपुस्तिका खोलने पर प्रथमतः जॉच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभॉति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्ष निरीक्षक को दिखाकर उसी सीरीज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।**

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Rough Work / रफ कार्य

1. The rate of reaction usually :
   (A) Decreases with increase in temperature
   (B) Remains unaffected with increase in temperature
   (C) Increases with increase in temperature
   (D) None of these
2. The half life period of a first-order reaction is 10 minutes. The time required for the concentration of the reactant to change from 0.08 M to 0.02 M is :
   (A) 40 Minutes
   (B) 30 Minutes
   (C) 20 Minutes
   (D) 10 Minutes
3. According to the collision theory, the rate of a reaction depends on :
   (A) Total number of molecules
   (B) The number of colliding molecules per ml per unit time
   (C) The average collision of molecules
   (D) None of these
4. The half-life period of a reaction is independent of the initial concentration of the reactants. The reaction is of :
   (A) Third order
   (B) Second order
   (C) Zero order
   (D) First order
5. In a first order reaction, the concentration of reactant decreases from 1.0 M to 0.25 M in 20 minutes. The value of K is :
   (A) 6.932
   (B) .06932
   (C) .6932
   (D) None of these

6. The rate at which a substance reacts is proportional to its :

(A) Concentration in g/litre

(B) Mole fraction

(C) Active mass

(D) None of these

7. According to activated complex theory, the rate of a reaction depended on :

(A) Initial velocity of molecules

(B) Energy of activation of the molecules

(C) The intensity of collision

(D) The velocity of molecules with which they cross the energy barrier

8. The unimolecular reaction is :

(A) $N_2O_5 \rightarrow 2NO_2 + \frac{1}{2}O_2$

(B) $H_2 + Cl_2 \rightarrow 2HCl$

(C) $PCl_3 + Cl_2 \rightarrow PCl_5$

(D) $2HI \rightarrow H_2 + I_2$

9. The specific rate constant of a first order reaction depends on :

(A) Temperature

(B) Concentration of the products

(C) Time

(D) Concentration of the reactants

10. For a chemical change $x \rightarrow y$, it is found that the rate of reaction doubles when the concentration is increased four times. The order in X for this reaction is :

(A) One

(B) Zero

(C) Half

(D) Two

11. The reaction : A+B+C→ Products is found to obey the rate law, $r = -\frac{d[A]}{dt} = k[A]^2[B]^{1/2}[C]^{1/2}$ the overall order of reaction is :

(A) $\frac{7}{2}$

(B) 3

(C) $\frac{5}{2}$

(D) 1

12. The E_a for the forward reaction is 40 kJ mol^{-1} and that for the reverse reaction is 60 kJ/mol. The reaction is :

(A) Endothermic

(B) Chain reaction

(C) Spontaneous reaction

(D) Exothermic

13. The correct statement is :

(A) Order is always equal to the molecularity of reaction

(B) The $t_{1/2}$ of a first –order reaction is independent of the initial concentration.

(C) The rate constant of a reaction decrease with temperature

(D) The unit of second-order rate constant is mol $dm^{-3}s^{-1}$

14. The $t_{1/2}$ of a reaction is doubled as the initial concentration of the reactant is doubled. The order of the reaction is :

(A) 1

(B) 0

(C) 2

(D) $1\frac{1}{2}$

15. The catalytic efficiency of two distinct enzymes can be compared on the basis of :
    (A) Product formation
    (B) Size of the enzymes
    (C) K_m
    (D) $P^H$of optimum value
16. In Michaelis- Menten Kinetics the rate-determining step is :
    (A) Complex formation step
    (B) The complex dissociation step to produce products
    (C) The product formation step
    (D) All of these
17. Efficiency of a catalyst depends on :
    (A) Optimum temperature
    (B) Absolute temperature
    (C) Room temperature
    (D) Molecular mass
18. Which one is not an example of homogeneous catalyst ?
    (A) Decomposition of $KClO_3$ in the presence of MnO_2
    (B) Formation of SO_3 in chamber process
    (C) Formation of SO_3 in contact process
    (D) Hydrolysis of methyl acetate in the presence of an acid
19. A catalyst is a substance which :
    (A) Shortens time to reach equilibrium
    (B) Supplies energy to the reaction
    (C) Increases the equilibrium concentration of the products
    (D) Changes the equilibrium constant of the reaction
20. Which of the following statement is not correct ?
    (A) A small amount of catalyst is sufficient to catalyse a reaction
    (B) Catalyst action is specific
    (C) The catalyst initiates the reaction
    (D) A catalyst does not alter the equilibrium

21. A _____ remains unchanged in mass and chemical composition at the end of the reaction :

(A) Reactant

(B) Product

(C) Catalyst

(D) Substrate

22. Which reaction is pseudo-unimolecular :

(A) Base catalysed hydrolysis of an ester

(B) $H_2 + Cl_2 \rightarrow 2HCl$

(C) $PCl_3 + Cl_2 \rightarrow PCl_5$

(D) Acid-catalysed hydrolysis of an ester

23. Which of the following is an emulsifier ?

(A) Detergents

(B) Soaps

(C) Both

(D) None

24. Tyndall phenomenon is shown by :

(A) Suspension

(B) Dilute solution

(C) Colloidal solution

(D) True solution

25. The emulsifying agent in milk is :

(A) Lactose

(B) Fat

(C) Casein

(D) Lactic acid

26. The minimum concentration of an electrolyte required to cause coagulation of a sol is called :
    (A) Gold number
    (B) Coagulation number
    (C) Flocculation
    (D) None of the above
27. Stability of lyophilic sol is due to :
    (A) Electric charge only
    (B) Brownian motion
    (C) Both Brownian motion and charge
    (D) Particle size
28. Gold number is a measure of :
    (A) Amount of gold required to break the colloid
    (B) Amount of gold required to protect the colloid
    (C) Amount of gold present in colloidal solution
    (D) The protection action of the colloid
29. The sky looks blue due to :
    (A) Reflection
    (B) Transmission
    (C) Scattering
    (D) Dispersion effect
30. Which method is used to destroy a sol ?
    (A) Addition of electrolyte
    (B) Condensation
    (C) Diffusion
    (D) Dialysis
31. Migration of colloidal particles under the in fluence of electric field is called :
    (A) Cataphoresis
    (B) Dialysis
    (C) Brownian movement
    (D) None of these

32. The potential difference between fixed charge layer and diffused layer with opposite charge is called :

(A) Zeta potential

(B) Electrode potential

(C) Colloidal potential

(D) None

33. The process in which the charge over colloidal particles is neutralized in the precipitation of the colloidal particles is called :

(A) Coagulation

(B) Diffusion

(C) electrolysis

(D) Dialysis

34. Colloidal solution in which the dispersed phase as well as the dispersion medium are liquid are called :

(A) Aerosol

(B) Emulsion

(C) True solution

(D) Gel

35. Strong electrolytes which give a normal solution at low concentration but show colloidal nature at higher concentration, is known as :

(A) Micelles

(B) True solution

(C) Sols

(D) None

36. The process of breaking emulsion to yield the constituent liquids is called :

(A) Emulsification

(B) Demulsification

(C) Condensation

(D) Coagulation

37. Kinetic activity of colloidal particles in dispersion medium is called :

(A) Cataphoresis

(B) Electro-osmosis

(C) Brownian movement

(D) None

38. The process of bringing a precipitated substance back into the colloidal state is known as :

(A) Peptization

(B) Osmosis

(C) Diffusion

(D) Dialysis

39. What is the effect of enzymes on the rate of biochemical reactions ?

(A) The rate increases

(B) It does not change

(C) The rate decreases

(D) Either (B) or (C)

40. At the end of the chemical reaction the catalyst remains :

(A) Unchanged in quantity but changed in composition

(B) Unchanged in composition but change in quantity

(C) Change in quantity and composition

(D) Unchanged in quantity and composition

41. Smoke is a colloidal solution of _____ carbon particles in the air (aerosol) :

(A) Positively charged

(B) Negatively charged

(C) Neutral

(D) None

42. If E_a of a reaction is zero, k is equal to :

(A) Zero

(B) The frequency factor

(C) (The frequency factor)$^{-1}$

(D) Infinity

43. The $t_{1/2}$ for a first–order reaction is 20 sec. The time required for 99.9% decomposition is :

(A) 400 sec

(B) 30 min

(C) 40 sec

(D) 199.9 sec

44. The pH of an aqueous solution is 4. its $[OH^-]$ is :

(A) 10^{-4}

(B) 10^{-10}

(C) 10^{-9}

(D) 10^{-12}

45. The cell potential becomes equal to E^o When :

(A) Equilibrium constant is 100

(B) Equilibrium constant is 10

(C) Equilibrium constant is 1

(D) Equilibrium constant is 10^{-1}

46. For the redox couple, Zn^{2+}(aq)/ Zn (s) and $Cu^{2+}(aq)/CuCs$) the reduction potentials are -0.76V and +0.34V respectively. if the couples are combined, as written above then :

(A) Zn is oxidized and Cu^{2+} is reduced

(B) Zn^{2+} is reduced and Cu is oxidized

(C) None of these

(D) Zn^{2+} and $Cu^{2+}$are reduced

47. For the overall cell reaction $H_2PO_3(aq) + 7H^+$(aq) $+7e^- \rightarrow PH_3(g) + 3H_2\ O(l)$, if pH is increased, then the cell potential :

(A) Remains constant

(B) Increases

(C) Decreases

(D) None of these

48. Kohlrausch's law can be used to determine :

(A) Solubility of a sparingly soluble salt

(B) Absolute ionic mobility

(C) λ_∞ for weak electrolyte

(D) All of these

49. On passing electrical current through an dectrolyte solution the cations :

(A) Move with different speed as compared to that of anions

(B) Move towards cathode with speed equal to that of anions towards anode

(C) Move with slower speed with that of anions

(D) Move with faster speed with that of anions

50. The postulates of Debye-Huckel theory is/are true for :

(A) Decrease in equivalent conductance with increase in concentration is due to fall in mobilities of ions due to their inter ionic effect

(B) The strong electrolyte is completely ionized at all dilution.

(C) The oppositely charged ions are completely distributed in the solution but the cations tend to be found in the vicinity of anions and vice versa

(D) All of the above

51. During titration of a weak acid against a weak base, there is a sharp increase in _____ at the end point :

(A) Specific conductance

(B) Equivalent conductance

(C) Conductivity

(D) None of these

52. If λ_∞ is the equivalent conductance at infinite dilution and λ_v is the equivalent conductance of the electrolyte at given dilution, the degree of dissociation is given by :

(A) $\alpha = \lambda_v - \lambda_\infty$

(B) $\alpha = \lambda_\infty - \lambda_v$

(C) $\alpha = \frac{\lambda_v}{\lambda_\infty}$

(D) $\alpha = \frac{\lambda_\infty}{\lambda_v}$

53. On titrating strong acid against a strong base, the end point is the point of :

(A) Zero conductance

(B) Minimum conductance

(C) Maximum conductance

(D) Conductance

54. At OK, the cell potential is :

(A) Less than E^0

(B) Equal to 1 V

(C) E^0

(D) Equal to zero

55. In an electrochemical cell :

(A) Potentail energy changes into electrical energy

(B) Kinetic energy decreases

(C) Chemical energy changes into electrical energy

(D) Potential energy decreases

56. Cell reaction is spontaneous when :

(A) E°_{red} is + ve

(B) ΔG° is + ve

(C) E°_{red} is - ve

(D) ΔG° is - ve

57. Saturated solution of KNO_3 is used to make a 'salt bridge' because :

(A) Velocity of K^+ and NO_3^- both are nearly the same

(B) Velocity of NO_3^- is greater than that of K^+

(C) Velocity of K^+ is greater than that of NO_3^+

(D) All of the above

58. The electrochemical cell stops working after sometime because :

(A) The cell reaction gets reversed

(B) Electrode potential of both the electrodes becomes zero

(C) One of the electrode is eaten away

(D) Electrode potential of both the electrode becomes equal

59. Which equilibrium is reached inside the two half cells of the electrochemical cells, what is the net voltage across the electrodes ?

(A) < 1

(B) $= 0$

(C) > 1

(D) Not defined

60. Which of the following statements is correct regading electrochemical cells ?

(A) Cell potential is an intensive property

(B) Gibbs free energy is undefined for an electrochemical cell

(C) Cell potential is an extensive property

(D) Gibbs free energy of an electrochemical cell is an intensive property

61. In an electrolytic cell, the electrode at which the electron enter the solution is called the _____ ; the chemical change that occurs at this electrode is called _____ :

(A) Cathode, oxidation

(B) Cathode, reduction

(C) Anode, oxidation

(D) Anode, reduction

62. The cell constant of a conductivity cell :

(A) Changes with a change of electrolyte

(B) Changes with a change of concentration of electrolyte

(C) Remain constant for a cell

(D) Changes with change in temperature.

63. Iron undergoes corrosion to produce _____ coloured hydrated ferric oxide :

(A) Green

(B) Red

(C) Brown

(D) Blue

64. The corrosion is the reverse process of _____

(A) Metal production

(B) Metal moulding

(C) Metal heating

(D) Metal extraction

65. The pH of a 0.1 M aqueous solution of NH_4OH ($K_b = 1.0 \times 10^{-5}$) is :

(A) 11

(B) 10.5

(C) 10

(D) 5

66. According to the law of mass action; for the reaction, 2A+B→ products, which equation holds goods ?

(A) Rate = k [A] $[B]^2$

(B) Rate = k [A] [B]

(C) Rate = k [A] $[B]^{1/2}$

(D) Rate = k $[A]^2$ [B]

67. Which of the following equilibria will shift to the right side on increasing the temperature ?

(A) $H_2O(g) \rightleftharpoons H_2(g) + \frac{1}{2}O_2(g)$

(B) $4HCl(g) + O_2(g) \rightleftharpoons 2H_2O(g) + 2Cl_2(g)$

(C) $CO(g) + H_2O(g) \rightleftharpoons CO_2(g) + H_2O(g)$

(D) $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$

68. With increase in temperature, the equilibrium constant of a reaction :

(A) Always increases

(B) Decreases

(C) Does not change

(D) None of these

69. On increasing the concentration of reactants in a reversible reaction, then equilibrium constant will :

(A) Unchanged

(B) Depend on the concentration

(C) Decrease

(D) Increase

70. What will be the pH of a buffer solution having an equal concentration of $B^-$and HB ($K_b = 10^{-10}\ for\ B^-$)

(A) 10

(B) 6

(C) 4

(D) 7

71. Which of the following aqueons solution will be the best conductor of electricity ?

(A) CH_3COOH

(B) HCl

(C) $C_6H_{12}O_6$

(D) NH_3

72. When the system $A + B \rightleftharpoons C + D$ is at equilibrium :

(A) The forward reaction has stopped

(B) The reverse reaction has stopped

(C) Neither the forward nor the reverse reaction has stopped

(D) Both the forward and reverse reaction have stopped

73. The rate of forward reaction is two times that of the backward reaction at a given temperature and identical concentration, K equilibrium is :

(A) 2.0

(B) 1.5

(C) 2.5

(D) 0.5

74. Which one of the following oxides of nitrogen will be the most stable one ?

(A) $2\ NO_2(g) \rightleftharpoons 2\ N_2(g) + O_2(g);\ K = 3.5 \times 10^{33}\ mol/L$

(B) $2\ NO_2(g) \rightleftharpoons N_2(g) + 2\ O_2(g);\ K = 6.7 \times 10^{16}\ mol/L$

(C) $2\ NO(g) \rightleftharpoons N_2(g) + O_2(g);\ K = 2.2 \times 10^{30}\ mol/L$

(D) $2\ N_2O_5(g) \rightleftharpoons 2\ N_2 + 5\ O_2(g);\ K = 1.2 \times 10^{24}\ mol/L$

75. Consider the following reaction equilibrium :

$$2\,SO_2(g) + O_2(g) \rightleftharpoons 2\,SO_3(g), \qquad \Delta H^0 = -198 \times kJ$$

On the basis of Le- chatelier's principle, the condition favourable for the forward reaction is :

(A) Lowering of temperature as well as pressure

(B) Any value of temperature and pressure

(C) Decreasing the temperature and increasing the pressure

(D) Increasing temperature as well as pressure

76. For a specific reaction, which of the following statement is true about equilibrium constant , K ?

(A) It increases if the concentration of one of the reactant is increased

(B) It increases if the concentration of one of the products is increased

(C) It changes with change in the temperature

(D) It always remains the same at different reaction conditions

77. Calculate the pH of a mixture containing 0.01 M acetic acid and 0.03 M sodium acetate solution (pk_a=4.8)

(A) 8.0

(B) 5.27

(C) 6.87

(D) 10

78. The number of moles of the acid or base which may be added to one litre or one dm^3 of a buffer solution for changing its pH by units is called :

(A) Buffer index

(B) Buffer capacity

(C) Buffer mixture

(D) Buffer solution

79. An example of basic buffer is a solution of :

(A) $NH_4OH + NaOH$

(B) CH_3COONH_4

(C) $NH_4OH + HCl$

(D) $NH_4OH + NH_4Cl$

80. Choose the correct statement from the following :

(A) $pOH = -pk_b - \log [salt] / [Base]$

(B) $pOH = pk_b + \log [salt] / [Base]$

(C) $pOH = pk_b + \log [Base] / [salt]$

(D) $pOH = -pk_b + \log [salt] / [Base]$

81. Both anionic and cationic hydrolysis occur in the case of :

(A) Salts of weak acid and strong base

(B) Salts of weak acid and weak base

(C) Salts of strong acid and weak base

(D) Salts of strong acid and strong base

82. The pH of a solution of salt of strong acid and weak base is given by :

(A) $\frac{1}{2} (\log K_w + \log K_b + \log C)$

(B) $\frac{1}{2} (- \log K_w - \log K_b - \log C)$

(C) $\frac{1}{2} (\log K_w - \log K_b + \log C)$

(D) $\frac{1}{2} (\log K_w - \log K_b - \log C)$

83. Heat of neutralization of a strong acid and weak base is less than 57.3 kJ/mol. This is because :

(A) The ionisation is complete but further reaction does not take place

(B) Some of the heat is transferred to the surroundings

(C) All the acid is not ionised

(D) All the base is not ionised

84. The pH of a solution of a strong acid and weak base at the equilibrium point is :

(A) Less than 7

(B) More than 7

(C) 7

(D) None of these

85. The pH of an acidic buffer according to the Henderson equation is given by :

(A) $pk_a - log\ \frac{[Salt]}{[Acid]}$

(B) $pk_a + log\ \frac{[Acid]}{[Salt]}$

(C) $pk_a + log\ \frac{[Salt]}{[Acid]}$

(D) $-pk_a + log\ \frac{[Salt]}{[Acid]}$

86. The degree of hydrolysis of a salt of a weak acid and a strong base is :

(A) Directly proportional to the square root of its molar concentration

(B) Inversly preportional to the square root of its molar concentration

(C) Equal to the square root of its molar concentration

(D) All of these

87. The pH value of a solution obtained by mixing 5 g of acetic acid and 7.5 g of sodium acetate and making the volume to 500 ml ($K_{CH_3COOH} = 1.8 \times 10^{-5}$) is :

(A) 5.78

(B) 4.78

(C) 3.78

(D) Zero

88. Cells in which the e.m.f produced is only due to the difference in the concentrations of the electrodes or that of the solutions of the electrolytes with which they are in contact are called :

(A) Electrochemical cell

(B) Concentration cell

(C) Electrolytic cell

(D) None of these

89. The products of the corrsion are :

(A) Oxides of metals

(B) Sulphides of metals

(C) Carbonates of metals

(D) All of these

90. For the over all reaction

$Cu^{2+}(C_1aq) + Zn(s) \rightarrow Zn^{2+}(C_2aq) + Cu(s)$of an electrochemical cell, the change in the free energy Δ G at a given temperature is a function of :

(A) ln C_2

(B) ln $(C_1 + C_2)$

(C) ln C_1

(D) ln $(\frac{C_2}{C_1})$

91. If all the substances taking part in areversible reaction are not in the same phase or state, then the equilibrium is termed as :

(A) Homogeneous equilibrium

(B) Heterogeneous equilibrium

(C) Irreversible reaction

(D) None of these

92. If the temperature of a system in equilibrium is increased, then the equilibrium will adjust it self :

(A) In the direction which releases the heat

(B) In the direction which absorbs the heat

(C) In the direction which either absorbs or releases the heat

(D) All of these

93. Soaps essentially form a colloidal solution in water and remove the greasy matter by :

(A) Adsorption

(B) Coagulation

(C) Absorption

(D) Emulsification

94. According to adsorption theory of catalysis, the speed of the reaction increases because :

(A) Adsorption produces heat which increases the speed of the reaction

(B) Adsorption lowers the activation energy of the reaction

(C) In the process of adsorption, the activation energy of the molecules becomes large

(D) The concentration of the reactant molecules at the active centres of the catalyst becomes high due to adsorption

95. Identify the correct statement regarding enzymes :

(A) Enzymes are specific biological catalysts that connot be poisoned.

(B) Enzymes are normally heterogeneous catalysts that are very specific in action

(C) Enzymes are specific biological catalysts that possess well defined active sites

(D) None of these

96. For a first order reaction of the type A→ products, if the intial concentration of A is 'a' and at a given time 't' the concentration of the product is 'x', the rate constant for the reaction is :

(A) $kt = \ln (a - x)$

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

(C) $k = \frac{1}{t}\ log\ (\frac{a}{a-x})$

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

97. The reaction : A → product follows first order kineties. In 40 minutes the concentration of A charges from 0.1 to 0.025 M. Then the rate of reaction when concentration of A is .01 M is :

(A) $1.73 \times 10^{-5} M\ min^{-1}$

(B) $3.47 \times 10^{-4} M\ min^{-1}$

(C) $1.73 \times 10^{-4} M\ min^{-1}$

(D) $3.47 \times 10^{-6} M\ min^{-1}$

98. The e.m.f of the cell in which the reaction

$$2\ Ag^{+}(aq) + H_2(g) \rightarrow 2\ Ag(s) + 2\ H^{+}(aq)$$

Occurs is 0.80V. The standard reduction of Ag^{+}/Ag electrode is :

(A) -0.40V

(B) 0.40V

(C) 0.80V

(D) -0.80V

99. Four alkali metals A,B,C and D are having standard electrode potentials as - 3.05, -1.66, -0.40 and 0.80V respectively. Which one will be the most reducing ?

(A) C

(B) B

(C) D

(D) A

100. An enzyme and a reactant molecule maintain relationship as :

(A) An association stabilized by a covalent bond

(B) Non complementary binding

(C) A temporary association

(D) One in which the enzyme is changed permanently

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