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1) **E_a appears as a potential energy hill between __for carrying out the reaction:**
a) Among the reactants b) Reactants and the products
c) Among the products d) None of the above

2) **The slope of the curve between 1/T and log k gives:**
a) Reaction rate b) Both of the above
c) Specific rate constant d) Activation energy

3) **The unit of the rate constant is the same as that of the rate of reaction in:**
a) 1st order reaction b) Zero-order reaction
c) 2nd order reaction d) 3rd order reaction

4) **Arrhenius equation can be used for evaluating:**
a) Specific rate constant b) Both of the above
c) Activation energy d) Half-life period

5) **A catalyst can:**
a) Accelerate reaction rate b) Retard reaction rate
c) Chemically un-consumed at the end of the reaction
d) All of the above

6) **The 2nd order reaction becomes 1st Order when:**
a) One of reactants is limiting
b) One of reactants is in large excess
c) None of reactants is in large excess
d) One of reactants is acidic

7) **Oxidation of SO_2(g) in the presence of NO(g) catalyst is an example of:**
a) Homogeneous catalysis b) Autocatalysis
c) Heterogeneous catalysis d) Negative catalysis

8) **Oxidation of SO_2(g) in the presence of V_2O_5(s) is an example of:**
a) Homogeneous catalysis b) Autocatalysis
c) Heterogeneous catalysis d) Negative catalysis

9) **Which one of the following is not a characteristic of a catalyst:**
a) It is specific in its action
b) Provides the reactants a low activation energy barrier
c) Becomes chemically changed at the end of a reaction
d) It can be poisoned by an impurity which deactivates its catalytic capability

10) **The specific rate constant of a chemical reaction is the rate of the reaction when the concentration of the reactant is:**
a) Less than unity b) Greater than unity c) Equal to unity
d) Equal to the concentration of 2nd order reaction

11) **An endothermic reaction A → B has an activation energy 15kcal /mol & heat of reaction 5kcal/mol.Activation energy for reaction B → A will be:**
a) 20kcal/mol b) 10kcal/mol
c) 15kcal/mol d) None of the above

12) **The rate of reaction is doubled for every 10°C rise in temperature. The increase in reaction rate as a result of temperature rise from 10°C to 100°C is:**
a) 112 b) 400 c) 512 d) 614

13) **For the 1st order decomposition reaction $2N_2O_5$ g → $4NO_2$(g) + O_2(g) the half-life is given as:**
a) 0.693/k b) log2/k c) 0.693/2k d) ln2/k

14) **For a chemical reaction to occur:**
a) The vessel shall be open
b) Reacting molecules should have less energy than Ea at the time of the collision
c) Reacting molecules must be properly oriented & energy more than or equal to E_a
d) reacting molecules must not collide with each other

15) **The reaction that involves gases, its rate does not depend upon?**
a) Catalyst b) Partial pressure
c) Temperature d) Moles dm^{-3}

16) **The mathematical relation between the rate of reaction and the concentrations of the reactants is known as the:**
a) Rate equation b) Arrhenius equation
c) Rate law d) Both a and c

17) **Which one affects the specific rate constant?**
a) Temperature b) Concentration of reactants
c) Catalyst d) All of these

18) **Which one is a chemical method for the determination of the rate of reaction?**
a) Spectrometry b) Refractrometric method
c) Dilatometric method d) Titration

19) **When the concentration of a reactant in the reaction is increased by 8 times, the rate increased only by 2 times. The order of the reaction is:**
a) 1 b) ½ c) 1/3 d) 2

20) **The rate expression for a reaction A+B → products is rate = k $[A]^{2/3}$ $[B]^{1/2}$ the order of reaction is:**
a) 0 b) 5/2 c) 3/2 d) 1

21) **If 75% of any given amount of radioactive element disintegrates in 60 min. Half-life of a radioactive element is.**
a) 20 min b) 30 min c) 45 min d) 25 min

22) **The unit of rate constant depends on?**
a) Number of reactants b) Order of reaction
c) Concentration terms d) Molecularity of reaction

23) **The unit of the rate constant of a second-order reaction is:**
a) mol dm^{-3} sec^{-1} b) mol^{-2} dm^{+6}
c) sec^{-1} d) mol^{-1} dm^{+3} sec^{-1}

24) **The half-life period of the zero-order reaction is equal to:**
a) 0.693/K b) 1/Ka c) a/2 d) $1.5/Ka^2$

25) **influence of temperature on the reaction rate is predicted by:**
a) Free energy change of reaction b) Arrhenius equation
c) Van der Waal' equation d) Kinetic equation

26) **If the energy of the activated complex lies close to the energy of reactants, it means that reaction is:**
a) Slow b) Endothermic c) Exothermic
d) Exothermic and fast

27) **Which of the following statements regarding a catalyst is not true?**
a) A catalyst does not alter equilibrium in a reversible reaction
b) A catalyst can initiate reaction which is not thermodynamically favorable
c) Catalytic reactions are very specific
d) A catalyst remains unchanged in composition and quantity

28) **The equation $K= Ae^{-Ea/RT}$ is called**
a) rate law b) rate equation c) Arrhenius's equation
d) general gas equation

29) **The Half-life period of C^{14} is 5760 years. 100mg of sample of C^{14} will reduced to 25 mg in**
a) 11520 years b) 2880 years c) 57600 Years d) 5760 Years

30) **The rate of a chemical reaction is independent of**
a) molecularity b) temperature c) nature of reactants
d) concentration of reactants

31) **The unit of rate constant depend upon**
a) order of reaction b) molecularity
c) number of reactants d) all of above.

32) **Indicate the enzyme which is used as a catalysis in the following reaction $C_6H_{12}O_6$ → $2C_2H_5OH+2CO_2$**
a) diastase b) zymase c) urease d) invertase

33) **The unit of rate constant for zero order reaction is**

a) dm^3s^{-1} b) mole $dm^{-3}s^{-1}$ c) dm^3 $mole^{-1}s^{-1}$ d) mole s^{-1}

34) A substance which makes the catalyst more effective is called
a) inhibitor b) retarder c) promoter d) auto-catalyst

35) In zero order reaction the rate is independent of
a) temperature of reaction b) concentration of reactants
c) concentration of products d) none of these

36) If rate equation of reaction 2A+B ⟶ product, Rate = $K[A]^2[B]$ and A is present in large excess then order of reaction is
a) 1 b) 2 c) 3 d) none of these

37) The energy of activation by using catalyst for a reaction is
a) increase b) decrease c) not changed d) moderate

38) On the basis of rate there are.....types of reactions
a) Two b) three c) four d) five

39) If a chemical reaction take place more than one steps than step will be rate determining
a) First b) final c) fast d) slow

40) Units of rate of reaction are.....
a) Moles $dm^{-3}sec^{-1}$ b) Moles $dm^{-3}sec$
c) $Moles^{-1}$ $dm^{-3}sec^{-1}$ d) Moles dm^3sec^{-1}

41) Rate of reaction for gas phase reaction would be.....
a) Atm sec b) $atm^{-1}sec$ c) atm sec^{-1} d) atm sec^1

42) At the end of the reaction instantaneous rate would be the average rate.
a) Faster than b) slower than c) equal to d) none of these

43) Rate of reaction = -d [C]/dt than "C" would be the concentration of .....
a) Reactant b) products c) both d) none of these

44) Order of reaction may be.....
a) Fractional b) negative c) zero d) all

45) Order of reaction gives information about .....
a) Slow step b) fast step c) mechanism of reaction
d) none of these

46) Photo-chemical reactions have order.
a) Fractional b) negative c) zero d) positive

47) Half-life of ... ...order reaction is inversely proportional to the square of initial concentration of reactants.
a) Zero b) first c) second d) third

48) Which one is true for reaction intermediate
a) It is stable b) it is present in balance equation
c) it cannot be isolated d) none of these

49) Graph between reactants and time has .....
a) Falling curve b) rising curve c) straight line d) all

50) If any species in reaction mixture absorb UV, Visible or IR radiation than physical method is used.
a) Spectrometry b) Dilatometric
c) Refractometric d) Optical Rotation

51) Which one is not the properties of Activated complex
a) Has minimum energy b) has transition existence
c) Short lived d) unstable

52) Arrhenius equation show effect of temperature on reaction
a) Order of b) Rate of
c) Rate constant of d) Equilibrium constant of

53) Energy of activation for exothermic reaction is for forward reaction.
a) More b) less c) moderate d) zero

54) Rate of reaction As the reaction proceed.
a) Increase b) decrease c) Remain same d) may increase or decrease

55) Which order of reaction obey the expression $t_{½}$= 1/Ka
a) First b) second c) Third d) Zero

56) If rate of reaction for 2A + B ⟶ products is $K[A]^2[B]$ and B is present in large excess then order of reaction is:
(a) 1 (b) 2 (c) 3 (d) zero

57) The rate of reaction:
(a)Increases as the reaction proceeds
(b) Decreases as the reaction proceeds
(c)Remains the same as the reaction proceeds.
(d) May decrease or increase as the reaction proceeds

58) With increase in 10⁰C temperature, rate of reaction doubles. This increase in rate of reaction is due to:
(a) Decrease in E_a of reaction
(b) Increase in number of effective collisions
(c) Increase in E_a of reactants
(d) Decrease in no. of effective collisions

59) The unit of rate constant is same as that of the rate of reaction in:
(a)1^{st} order reaction (b) 3^{rd} order reaction
(c) Zero order reaction (d) 2^{nd} order reactions

60) Velocity constant is the rate of reaction when the concentrations of reactants are.
(a) Zero (b) Unity (c) Two (d) Three

61) The rate of the reaction has the dimensions of:
(a) $moldm^{-3}$ (b) $moldm^{-3}s^{-1}$ (c) $moldms^{-1}$ (d) $mol^{-1}dm^{-3}s$

62) The unit of the rate constant for zero order reaction is:
(a)dm^3s^{-1} (b) $mols^{-1}$ (c) $dm^{-3}mol^{-1}s^{-1}$ (d) $moldm^{-3}s^{-1}$

63) The true representation for the units of rate constant k for the first order reaction:
(a) sec^{-1} (b) mole $dm^{-3}s$ (c) mole $dm^{-3}s^{-1}$ (d) $mole^{-1}$ $dm^{-3}s$

64) Hydrolysis of Tertiary butyl bromide has order of reaction:
(a) First order (b) Pseudo first order
(c) Second order (d) Third order

65) Process when catalyst and reactants are in same phase is.
a) Catalysis process b) Homogeneous process
c) Heterogeneous process d) Autocatalysis

66) In certain chemical reactions, products formed act as catalyst called as.
a) Catalyst for catalyst b) Negative catalysis
c) Autocatalysis d) Auto-activator

67) Glucose molecule converts into ethanol by an enzyme.
a) Invertase b) Diastase c) Zymase d) Urease

68) When rate of reaction is retarded by adding a substance, then it is said to be.
a) Autocatalyst b) Negative catalyst c) Activator d) Catalyst retarded

69) Process which takes place in the presence of a catalyst is called as.
a) Autocatalysis b) Enzyme catalysis
c) negative catalysis d) Catalysis

70) Minimum amount of energy required for an effective collision is called.
a) Lattice energy b) Effective energy c) Initial energy d) Activation energy

71) Collisions may be effective or ineffective among reactants molecules depending upon.
a) Energy of ionization b) Effective energy
c) Activation energy d) Concentrations

72) Half-life of a reaction is inversely proportional to the initial concentration of.
a) Reactants b) Products c) Reagents d) Solvent

73) The active masses of the substance in large excess remains... throughout.
a) Negligible b) Smaller c) Constant d) Larger

74) **In method of large excess, the substance which is taken in... controls the rate of reaction.**
a) Large amount b) Small amount c) Neutral amount d) Medium amount

75) **The reactions are due to of reactant molecules.**
a) Activation energy b) Kinetic energy c) Collisions d) Reactivity

76) **For exothermic reactions, energy of activation is... in backward reaction.**
a) Low b) High c) Both d) Nothing above

77) **Slowest step in a chemical reaction is called as.**
a) Rate formation step b) Rate calculating step c) Rate determining step d) Fast step

78) **Rate of reaction between two specific time intervals is called as.**
a) Rate of reaction b) Average rate c) Instantaneous rate d) Specific rate

79) **At ordinary temperature the rate of all reactions is slower because**
(a) all reactions are endothermic (b) all reaction are exothermic (c) all reaction are oxidation reduction reactions (d) very few molecules possess activation energy

80) **The Enzyme which catalyze the Hydrolysis of sugar solution into glucose is called:**
(a) Urease (b) Invertase (c) Zymase (d) Lactase

81) **Which elements are used as catalyst inhibitor:** (a) Sulphur (b) Arsenic (c) Antimony (d) All of these

82) **Hydrogenation of unsaturated organic compounds is catalyzed by finely divided Ni, Pd or Pt. This reaction is an example of:**
(a) Homogenous catalysis (b) Heterogeneous catalysis (c) Autocatalysis (d) None of these

83) **Which of the following reactions represent correct mechanism of Enzyme catalysis:**
(a) $E + S \leftrightarrow P + E$ (b) $E + S \rightarrow ES \rightarrow P + E$ (c) $E + S \leftrightarrow ES \leftrightarrow P + E$ (d) $E + S \leftrightarrow ES \rightarrow P + E$

84) **Tetraethyl lead is added to petrol acts as**
(a) Negative catalyst (b) Catalyst (c) Poisner (d) Activator

85) **With increase in temperature of 10 K of the reacting gases the rate of reaction is doubled because**
(a) increase in number of collisions (b) number of molecules having energy more than Ea is double (c) increase in order of reaction (d) increase in surface area

86) **For endothermic reactions, the reactants are at than products.**
a) Lower energy level b) Higher energy level c) Both d) None

87) **For endothermic reaction, activation energy is for forward reaction than backward.**
a) High b) Low c) Medium d) Normal

88) **In hydrolysis of ethyl acetate, order of reaction may calculate through concentration of.**
a) Mineral acid b) Water c) Alcohol d) Ethyl acetate

89) **Rate at any one instant during interval is called.**
a) Instantaneous rate b) Average rate c) Specific rate d) Rate of reaction

90) **The unit of slope of Arrhenius equation is;**
a) Kj b) KJ mole $^{-1}$ c) K d) K $^{-1}$

91) **Fermentation of glucose is catalyzed by;**
a) Diastase b) zymase c) amylase d) invertase

92) **Which of the following inhibits catalyst used in Haber's process?**
a) Fe b) Ni c) CO d). SiO_2

93) **Hydrolysis of methyl acetate is an example of ;**
a) 1 st order b) 2nd order c) zero order d) Pseudo first order

94) **How many years are required to decay 75mg of 100mg of C-14? ($t_{½}$ = 5760yrs)**
a) 5760 b) 11520 c) 66600 d) 3880

95) **In general rate of reactions can be increased by all the factors except**
a) Increasing the temperature b) Increasing the concentration of reactants c) Increasing the activation energy d) using catalyst

96) **When a reaction proceeds in a sequence of steps, the overall rate is determined by**
a) slowest step b) fastest step c) order of different steps d) molecularity of the steps

97) **Which of the following can give order of a reaction?**
a) balanced chemical equation b) experimental rate law c) magnitude of specific reaction rate d) nature of reactants

98) **If the reaction $P + Q \rightarrow R + S$ is described as being of zero order with respect to P, it means that:**
a) P is a catalyst in this reaction b) No P molecules possesses sufficient energy to react c) the concentration of P does not change during the reaction. d) The rate of reaction is independent of the concentration of P e) The rate of reaction is proportional to the concentration of Q

99) **Sum of all the exponents of molar concentration of the reactant present in the rate equation is known as __.**
a) molecularity b) order of reaction c) rate of reactions d) gradient e) slope

100) **Which of the following is an element?**
a) Tap water b) Graphite c) Sea water d) Brass e) Sulphuric acid

101) **Which of the following is most likely to increase the rate of a reaction?**
a) Decreasing the temperature b) Decreasing the surface area of reactant c) Reducing activation energy d) Negative catalysts

102) **Which of the following reaction is the third order reaction?**
a) N_2O_5 ------> $2NO_2 + O_2$ b) $2NO + O_2$ > $2NO_2$ c) $2CH_3CHO$ ------> $2CH_4 + 2CO$ d) $2NH_3$ > $N_2 + 3H_2$

103) **The rate equation for a reaction is given: rate =k [A] [B]. If concentration units are mol dm^{-3} what are the possible units of rate constant, k?**
a) mol $dm^{-3}s^{-1}$ b) $mol^{-1} dm^3 s^{-1}$ c) mol $s^{-2}dm^3$ d) $mol^{-1} s^{-1}$ e) s^{-1}

104) **What will be the effect on the rate of reaction of chemical reaction? $2NO (g) + O_2$ g $\rightarrow 2NO_2$, if concentration of NO is halved?**
a) 4 times b) 1/4 times c) 2 times d) 1/2 times e) No effect

105) **A substance which does not lower energy of activation but combines with reactant molecule is called:-**
a) Catalyst b) Negative catalyst. c) Positive catalyst d) None

106) **$2NO + O_2 \rightarrow 2NO_2$ whereas $dx/dt = k[NO]^2[O_2]$ than reaction is:**
a) 1st order reaction b) 2nd order reaction c) 3rd order reaction d) 0 order reaction

107) **Which of the following will increase the rate of a reaction:**
a) Lowering the temp b) Increasing volume c) Reducing activation energy d) Increasing activation energy

108) **$H_2 + Br_2 \rightarrow 2HBr$ The rate expression is : Rate =K $[H_2]$ $[Br]^{1/2}$, the order of the reaction is:**
a) 2 b) 1.5 c) 1 d) Zero

109) **A catalyst can't initiate the reaction but speeds up a reaction which is possible:**
a) Physically b) Thermodynamically c) Chemically d) In laboratory

110) **Rate of reaction depends upon all of the following except:**
a) Concentration b) Pressure c) Temperature d) Molecularity

111) **The effect of temperature on the rate of reaction is given by:**

a) Arrhenius equation b) Newton's equation
c) Change in degree of hydration
d) All of the above e) Both A and B

112) A certain chemical reaction follows the following rate law: Rate K [A] [B]^2 The order of reaction is:
a) 1 b) 2 c) 3 d) 4 e) 5

113) Rate = K [N_2O_5] has __of reaction.
a) First order b) Pseudo first order c) Second order d) Third order e) Pseudo order

114) For a reaction 2A + B ⇌ C + D the active mass of B is kept constant and that of A is tripled. It is observed that the rate of reaction
a) decreases three times b) decreases nine times
c) increases six times d) increases nine times

115) The change in concentration of reactant or product per unit time is called:
a) Rate constant b) Rate of reaction
c) Rate equation d) Rate law

116) The term + dx/dt in the rate expression refers to the:
a) Decrease in concentration of the reactant x
b) Instantaneous rate of the reaction
c) Increase in concentration of the reactant x
d) Increase in solubility of the reactants

117) Platinum is poisoned by
a) arsenic b) silver c) zinc d) argon

118) A chemical reaction may be
a) 1st order b) 2nd order c) zero order
d) -ve order e) all of these

119) Rate of chemical reaction can be measured by
a) graphical method b) hit and trial method c) method of large excess d) none of these

120) Addition of catalyst to a reaction changes the
a) enthalpy of reaction b) entropy of reaction
c) nature of reactants d) activation energy

121) The rate of reaction can be measured by
a) physical method b) chemical method c) both
d) none of these

122) Which factor does not affect the rate of reaction
a) light b) nature of reactants c) surface area
d) amount of reactant

123) Optical rotation method is used when
a) reaction involves ions b) olume change occurs
c) change in refractive index d) change in optical activity

124) Refracto-metric method is used when
a) reaction involves ions b)volume change occurs
c) change in refractive index d) change in optical activity

125) Dilatometric method is used when
a) reaction involves ions b) volume change occurs
c) change in refractive index d) change in optical activity

126) Spectrophotometric method is used when
a) reaction involves ions b) volume change occurs
c) change in refractive index d) none of these

127) Which type of metals are usually used as catalyst
a) Coinage metals b) transition metals
c) alkali metals d) alkaline earth metals

128) Photosynthesis has the order of reaction
a) zero b) 1st c) 2nd d) none of these

129) A substance which is not catalyst but increases the activity of a catalyst
a) Promoter b) inhibitor c) -ve catalyst d) poison

130) Enzymes are
a) proteins b) lipids c) micro-organisms d) vitamins

131) Which property of liquid is measured by polarimeter
a) Conductance b) refractive index
c) optical activity d) none of these

132) The catalyst used for the reaction
HCOOH ---------- → H_2 + CO_2
a) Copper b) alumina c) silica d) iron

133) Which of the following is the example of homogeneous catalysis
a) Formation of ghee from oil
b) formation of SO_3 by contact process
c) Hydrolysis of ester
d) formation of NH_3 in Haber process

134) Photochemical reactions are
a) zero order b) 1st order c) 3rd order d) none of these

135) Energy of activated complex is
a) greater than reactants and products b)less than reactants and products c)equal to the products d)equal to reactants