**ACTIVE SITE TUTORIALS**

**Date :**23-07-2019 **TEST ID: 165**

**Time :** 07:17:00 **CHEMISTRY**

**Marks :** 1748

4.CHEMICAL KINETICS

**Single Correct Answer Type**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | The activation energies of two reactions are and . If the temperature of the system is increased from to , the rate constant of the reactions changes from to in the first reaction and and in the second reaction. Predict which of the following expression is correct? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 2. | Effective collisions are those in which molecules must: | | | | | | | |
|  | a) | Have energy equal to or greater than the threshold energy | | | | | | |
|  | b) | Have proper orientation | | | | | | |
|  | c) | Acquire the energy of activation | | | | | | |
|  | d) | All of the above | | | | | | |
| 3. | Consider the following statements,  The rate law for the acid catalysed hydrolysis of an ester being given as  .  If the acid concentration is doubled at constant ester concentration  1. The second order rate constant, k is doubled.  2. The pseudo first order rate constant, k is double.  3. The rate of the reaction is doubled.  Which of the above statements are correct? | | | | | | | |
|  | a) | 1 and 2 | b) | 2 and 3 | c) | 1 and 3 | d) | 1,2 and 3 |
| 4. | Half-life of two samples is 0.1 and 0.8 s. Their respective concentration is 400 and 50 respectively.  The order of reaction is | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 1 | d) | 4 |
| 5. | The units of rate of reaction are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 6. | Units of rate constant of first and zero order reactions in terms of molarity unit are respectively | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 7. | The half time of a second order reaction is: | | | | | | | |
|  | a) | Inversely proportional to the square of the initial concentration of the reactants | | | | | | |
|  | b) | Inversely proportional to the initial concentration of the reactants | | | | | | |
|  | c) | Proportional to the initial concentration of reactants | | | | | | |
|  | d) | Independent of the initial concentration of reactants | | | | | | |
| 8. | vs times are a straight line. Order of reaction is | | | | | | | |
|  | a) | First | b) | Second | c) | Zero | d) | Third |
| 9. | For an endothermic reaction where, represents the enthalpy of the reaction in kJ/mol, the minimum value for the energy of activation will be | | | | | | | |
|  | a) | Less than | b) | Zero | c) | More than | d) | Equal to |
| 10. | The unit of rate constant for a zero order reaction | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 11. | What is the formula to find value of for a zero order reaction? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 12. | For the reaction, The variation of the concentration of the products is given by the curve: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 13. | Acid hydrolysis of sucrose is a | | | | | | | |
|  | a) | Pseudo first order reaction | | | b) | Zero order reaction | | |
|  | c) | Second order reaction | | | d) | Unimolecular reaction | | |
| 14. | For a first order reaction the graph is given below    is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 15. | The rate constant of a first order reaction is At a reactant concentration of the rate of reaction would be: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 16. | The rate constant for the reaction, is. If the rate is then the concentration of is | | | | | | | |
|  | a) | 0.04 | b) | 0.8 | c) | 0.07 | d) | 1.4 |
| 17. | Activation energy of a reaction is: | | | | | | | |
|  | a) | The energy released during the reaction | | | | | | |
|  | b) | The energy evolved when activated complex is formed | | | | | | |
|  | c) | Minimum amount of energy needed to overcome the potential barrier of reaction | | | | | | |
|  | d) | The energy needed to form one mole of the product | | | | | | |
| 18. | The activation energy for a reaction is The increase in the rate constant when its temperature is increased from is: | | | | | | | |
|  | a) | 10% | b) | 100% | c) | 50% | d) | 63% |
| 19. | The rate of first order reaction, Products, is If the concentration of is the rate constant is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 20. | For the above reaction which of the following is not correct above rates of reaction? | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 21. | A substance undergoes first order decomposition. The decomposition follows to parallel first order reactions as:    The percentage distribution of and are: | | | | | | | |
|  | a) | and | | | | | | |
|  | b) | and | | | | | | |
|  | c) | and | | | | | | |
|  | d) | and | | | | | | |
| 22. | In Arrhenius plot intercept is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 23. | Half-life period of a first order reaction is seconds. The specific rate constant of the reaction is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 24. | On addition of to white ppt. occurs: | | | | | | | |
|  | a) | Instantaneously | | | | | | |
|  | b) | With a measurable speed | | | | | | |
|  | c) | Slowly | | | | | | |
|  | d) | None of these | | | | | | |
| 25. | Which is correct about zero order reaction? | | | | | | | |
|  | a) | Rate of reaction depends on decay constant. | | | | | | |
|  | b) | Rate of reaction is independent of concentration. | | | | | | |
|  | c) | Unit of rate constant is | | | | | | |
|  | d) | Unit of rate constant is | | | | | | |
| 26. | The half-life period of a first order reaction is 1 min 40 s. Calculate its rate constant. | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 27. | The reaction is found to be first order in A, second in B and zero order in C. What is the effect on the rate of increasing concentration of A, B and C two times? | | | | | | | |
|  | a) | 72 times | b) | 8 times | c) | 24 times | d) | 36 times |
| 28. | In a reaction, the threshold energy is equal to: | | | | | | | |
|  | a) | Activation energy normal energy of reactants | | | | | | |
|  | b) | Activation energy normal energy of reactants | | | | | | |
|  | c) | Activation energy | | | | | | |
|  | d) | Normal energy of reactants | | | | | | |
| 29. | Which one is not correct? | | | | | | | |
|  | a) | Rate of zero order reaction depends upon initial concentration of reactant | | | | | | |
|  | b) | Rate of zero order reaction does not depend upon initial concentration of reactant | | | | | | |
|  | c) | of first order reaction is independent of initial concentration of reaction | | | | | | |
|  | d) | of zero order reaction is dependent of initial concentration of reaction | | | | | | |
| 30. | A reaction proceeds by first order, 75% of this reaction was completed in 32 min. the time required for 50% completion is | | | | | | | |
|  | a) | 8 min | b) | 16 min | c) | 20 min | d) | 24 min |
| 31. | The rate of the reaction  is equal to rate If concentration is expressed in mol/L. The unit of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 32. | Observe the following reaction,  The rate of formation of C is 𝑚𝑜𝑙  What is the value of ? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 33. | The unit of rate constant of a third order chemical reaction is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 34. | is an example of …… order. | | | | | | | |
|  | a) | Zero | b) | Second | c) | Third | d) | Pseudo first order |
| 35. | Collision theory is applicable to | | | | | | | |
|  | a) | First order reactions | | | b) | Zero order reactions | | |
|  | c) | Bimolecular reactions | | | d) | Intra-molecular reactions | | |
| 36. | The efficiency of an enzyme in catalyzing a reaction is due to its capacity | | | | | | | |
|  | a) | To form a strong enzyme substrate complex | | | b) | To decrease the bond energy of all substrate molecules | | |
|  | c) | To change the shape of the substrate molecule | | | d) | To lower the activation energy of the reaction | | |
| 37. | The reaction  Which of the following does not express the reaction rate? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 38. | If are the activation energies of the forward and reverse reactions and the reaction is known to be exothermic then | | | | | | | |
|  | a) |  | | | | | | |
|  | b) |  | | | | | | |
|  | c) |  | | | | | | |
|  | d) | No relation can be given between as data are not sufficient | | | | | | |
| 39. | Milk turns sour at three times as faster as at . The energy of activation for souring of milk is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 40. | Which plots will give the value of activation energy? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 41. | In a second order reaction when the concentration of both reactant are equal, the reaction is completed in 500 s. How long will it take for the reaction to go to 60% completion? | | | | | | | |
|  | a) | 1000 s | b) | 300 s | c) | 3000 s | d) | 2000 s |
| 42. | The rate constant for the reaction Product was found to be after and The order of reaction is: | | | | | | | |
|  | a) | 2 | b) | 3 | c) | Zero | d) | 1 |
| 43. | The differential rate expression for the reaction is: | | | | | | | |
|  | a) |  | | | | | | |
|  | b) |  | | | | | | |
|  | c) |  | | | | | | |
|  | d) |  | | | | | | |
| 44. | For the elementary step,  the is: | | | | | | | |
|  | a) | Zero | b) | 1 | c) | 2 | d) | Cannot ascertained |
| 45. | A graph plotted between log concentration is a straight line. What conclusion can you draw from the given graph? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of the above |
| 46. | If is the initial concentration then time required to decompose half of the substance for order is inversely proportional to: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 47. | The hydrolysis of ethyl acetate,  is: | | | | | | | |
|  | a) | First order | b) | Second order | c) | Third order | d) | Zero order |
| 48. | The rate law for a reaction between the substances A and B is given by  rate . On doubling the concentration of A and halving the concentration of B, the ratio of the new rate to the earlier rate of the reaction will be as | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 49. | For the reaction  The experimental data suggest  the molecularity and order of the reaction are respectively | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 50. | The rate of reaction increases with temperature due to | | | | | | | |
|  | a) | Decrease in activation energy | | | b) | Increase in activation energy | | |
|  | c) | Increase in collision frequency | | | d) | Increase in concentration | | |
| 51. | In a first order reaction, the concentration of the reactant is decreased from to in 20 minute. The rate constant of the reaction would be: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 52. | The reaction obey I order with respect to and both  Which of the following mechanism is in consistent with the given fact?  Mechanism  Mechanism | | | | | | | |
|  | a) | and both | b) | Neither nor | c) | only | d) | only |
| 53. | Two reactions products and products have rate constants and at temperature and activation energies and respectively. If and and assuming that for both the reactions is same, then: | | | | | | | |
|  | a) | At higher temperatures will be greater than | | | | | | |
|  | b) | At lower temperature and will differ more and | | | | | | |
|  | c) | As temperature rises and will be close to each other in magnitude | | | | | | |
|  | d) | All of the above | | | | | | |
| 54. | The half life for a reaction … of temperature. | | | | | | | |
|  | a) | Independent | | | | | | |
|  | b) | Increased with increase | | | | | | |
|  | c) | Decreased with increase | | | | | | |
|  | d) | Dependent | | | | | | |
| 55. | The following mechanism has been proposed for the reaction of NO with to form NOBr  If the second step is the rate determining step, the order of the reaction with respect to NO(g) is | | | | | | | |
|  | a) | 1 | b) | 0 | c) | 3 | d) | 2 |
| 56. | The unit and value of rate constant and that of rate of reaction are same for | | | | | | | |
|  | a) | Zero order | b) | First order | c) | Second order | d) | Third order |
| 57. | According to collision theory of reaction rates: | | | | | | | |
|  | a) | Every collision between reactants leads to chemical reaction | | | | | | |
|  | b) | Rate of reaction is proportional to velocity of molecules | | | | | | |
|  | c) | All reactions which occur in gaseous phase are zero order reactions | | | | | | |
|  | d) | Rate of reaction is directly proportional to collision frequency | | | | | | |
| 58. | Half-life of a reaction is found to be inversely proportional to the cube of initial concentration. The order of reaction is | | | | | | | |
|  | a) | 4 | b) | 3 | c) | 5 | d) | 2 |
| 59. | A reaction involving two different reactants can never be | | | | | | | |
|  | a) | Bimolecular reaction | | | b) | Second order reaction | | |
|  | c) | First order reaction | | | d) | Unimolecular reaction | | |
| 60. | For the non-equilibrium process, Products, the rate is first order with respect to and second order respect to If mole each of and are introduced into a 1 vessel and the initial rate was - The rate (in ) when half of the reactants have been used: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 61. | The activation energy of a reaction is zero. The rate constant for the reaction | | | | | | | |
|  | a) | Decreases with decrease of temp | | | b) | Increases with increase of temp | | |
|  | c) | Decreases with increase of temp | | | d) | Is nearly independent of temp | | |
| 62. | The burning of coal represented by the equation; The rate of this reaction is increased by: | | | | | | | |
|  | a) | Decrease in the concentration of oxygen | | | | | | |
|  | b) | Powdering the lumps of coal | | | | | | |
|  | c) | Decreasing the temperature | | | | | | |
|  | d) | Providing inert atmosphere for burning | | | | | | |
| 63. | At room temperature, the reaction between and to give is fast, while that between and is slow. It is due to: | | | | | | | |
|  | a) | is smaller in size than that of | | | | | | |
|  | b) | is poisonous | | | | | | |
|  | c) | The activation energy for the reaction,  is less than | | | | | | |
|  | d) | None of the above | | | | | | |
| 64. | The rate of first order reaction is at 0.5 M concentration of the reactant. The half-life of reaction is | | | | | | | |
|  | a) | 0.383 min | b) | 23.1 min | c) | 8.73 min | d) | 7.53 min |
| 65. | The rate constant of a first order reaction at is . The temperature coefficient of this reaction is 2. What is the rate constant (in ) at for this reaction? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 66. | The minimum energy required for the reacting molecules to undergo reaction is | | | | | | | |
|  | a) | Potential energy | | | b) | Kinetic energy | | |
|  | c) | Thermal energy | | | d) | Activation energy | | |
| 67. | The decomposition of occur as and follows Ist order kinetics, hance | | | | | | | |
|  | a) | The reaction is unimolecular | | | b) | The reaction is bimolecular | | |
|  | c) |  | | | d) | None of the above | | |
| 68. | The rate of a chemical reaction doubles for every rise of temperature. If the temperature is raised by 50, the rate of the reaction increases by about | | | | | | | |
|  | a) | 10 times | b) | 24 times | c) | 32 times | d) | 64 times |
| 69. | Which of the following statement is incorrect about the molecularity of a reaction? | | | | | | | |
|  | a) | Molecularity of a reaction is the number of molecules of the reactants presents in the balanced equation | | | | | | |
|  | b) | Molecularity of a reaction is the number of molecules in the slowest step | | | | | | |
|  | c) | Molecularity is always a whole number | | | | | | |
|  | d) | There is no difference between order and molecularity of a reaction | | | | | | |
| 70. | For a reaction Products, the rate of the reaction was doubled when the concentration of was doubled. When the concentration of and were doubled, the rate was again doubled, the order of the reaction with respect to and are: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 71. | An exothermic chemical reaction occurs in two steps as follows  (fast)  (slow)  The progress of the reaction can be best represented by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | All are correct |
| 72. | According to the Arrhenius equation a straight line is to be obtained by plotting the logarithm of the rate constant of a chemical reaction against | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 73. | The rate constant is numerically the same for three reactions of first, second and third order respectively. Which one is true for rate of three reaction? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | All of these |
| 74. | Mathematical expression for i.e., when (1/4)th reaction is over following first order kinetics can be given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 75. | The rate of reaction:  is given by the rate, equation rate The value of the rate constant can be increased by: | | | | | | | |
|  | a) | Increasing the temperature | | | | | | |
|  | b) | Increasing the concentration of NO | | | | | | |
|  | c) | Increasing the concentration of the | | | | | | |
|  | d) | Doing all of these | | | | | | |
| 76. | A reaction was observed for 15 days and the percentage of the reactant remaining after the days indicated was recorded in the following table.   |  |  | | --- | --- | | **Time (days)** | **% Reactant remaining** | | 0 | 100 | | 2 | 50 | | 4 | 39 | | 6 | 25 | | 8 | 21 | | 10 | 18 | | 12 | 15 | | 14 | 12.5 | | 15 | 10 |   Which one of following best describes the order and the half-life of the reaction?  **Reaction order Half-life (days)** | | | | | | | |
|  | a) | First 2 | | | b) | First 6 | | |
|  | c) | Second 2 | | | d) | Zero 6 | | |
| 77. | In the reaction  The rate of appearance of bromine is related to rate of disappearance of bromide ions as following: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 78. | Which one of the following is a second order reaction? | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 79. | The temperature coefficient of most of the reactions lies between | | | | | | | |
|  | a) | 1 and 3 | b) | 2 and 3 | c) | 1 and 4 | d) | 2 and 4 |
| 80. | In respect of the equation in chemical kinetics, which one of the statement is correct? | | | | | | | |
|  | a) | is Rydberg constant | | | b) | is equilibrium constant | | |
|  | c) | is energy of activation | | | d) | is adsorption factor | | |
| 81. | The rate of chemical reaction (except zero order): | | | | | | | |
|  | a) | Decreases from moment to moment | | | | | | |
|  | b) | Remains constant throughout | | | | | | |
|  | c) | Is independent of the order of reaction | | | | | | |
|  | d) | None of the above | | | | | | |
| 82. | For a zero order reaction | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 83. | Effect of temperature on reaction rate is given by | | | | | | | |
|  | a) | Claisen-Clapeyron equation | | | b) | Arrhenius equation | | |
|  | c) | Gibbs Helmholtz equation | | | d) | Kirchoff’s equation | | |
| 84. | The Arrhenius equation expressing the effect of temperature on the rate constant of reaction is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 85. | Find the two third life of a first order reaction in which per second | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 86. | Product  If concentration of A is doubled, rate increases 4 times. If concentration of A and B are doubled, rate increases 8 times. The differential rate equation of the reaction will be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 87. | For the reaction the rate expression is When the concentration of is doubled, the rate of reaction is quadrupled. The value of is | | | | | | | |
|  | a) | 1 | b) | Zero | c) | 3 | d) | 2 |
| 88. | The rate constant for the first order reaction is . How much time will it take to reduce the concentration of the reaction to 1/16 M value ? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 89. | In the reaction,  initial pressure is 500 atm and rate constant k is  after 10 min the final pressure of is | | | | | | | |
|  | a) | 490 atm | b) | 250 atm | c) | 480 atm | d) | 420 atm |
| 90. | For a chemical reaction, …… can never to a fraction | | | | | | | |
|  | a) | Order | b) | Half life | c) | Rate constant | d) | Molecularity |
| 91. | The time taken for the completion of 3/4 of a first order reaction is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 92. | What is the ratio of the rate of decomposition of to rate of formation of ? | | | | | | | |
|  | a) | 1:2 | b) | 2:1 | c) | 1:4 | d) | 4:1 |
| 93. | A first order reaction is 75% complete after 32 min. when was 50% of the reaction completed? | | | | | | | |
|  | a) | 16 min | b) | 8 min | c) | 4 min | d) | 32 min |
| 94. | For a reaction, , rate is given by ,hence, the order of the reaction is | | | | | | | |
|  | a) | 3 | b) | 2 | c) | 1 | d) | 0 |
| 95. | The accompanying figure depicts the change in concentration of species and for the reaction as a function of time. The point of intersection of the two curves represents: | | | | | | | |
|  | a) |  | | | | | | |
|  | b) |  | | | | | | |
|  | c) |  | | | | | | |
|  | d) | Data is insufficient to predict | | | | | | |
| 96. | The rate constant of a reaction at temperature 200 K is 10 times less than the rate constant at 400 K. What is the activation energy of the reaction? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 97. | A zero order reaction is one: | | | | | | | |
|  | a) | In which reactants do not react | | | | | | |
|  | b) | In which one of the reactants is in large excess | | | | | | |
|  | c) | Whose rate does not change with time | | | | | | |
|  | d) | Whose rate increases with time | | | | | | |
| 98. | In a first order reaction the was found to be 8 after 10 minute. The rate constant is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 99. | If the rate of reaction A doubles on increasing the concentration of A by 4 times, the order of the reaction is | | | | | | | |
|  | a) | 2 | b) | 1 | c) |  | d) | 4 |
| 100. | The rate of chemical reaction | | | | | | | |
|  | a) | Increase as the reaction proceeds | | | b) | Decrease the reaction proceeds | | |
|  | c) | May increase or decrease during reaction | | | d) | Remains constant as the reaction proceeds | | |
| 101. | For zero order reaction, the integrated rate equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 102. | The half-life period of a first order reaction is 69.3 s. what is the rate constant? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 103. | A reaction has a rate constant of If initial concentration of the reactant is half-life of the reaction | | | | | | | |
|  | a) | 1.4 min | b) | 10 min | c) | 15 min | d) | 20 min |
| 104. | The bromination of acetone that occurs in acid solution is represented by this equation.  These kinetic data were obtained for given reaction concentrations.  Initial concentrations,   |  |  |  |  | | --- | --- | --- | --- | |  |  |  | Initial rate, disappearance  of | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  |   Based on these data, the rate equation is: | | | | | | | |
|  | a) |  | | | | | | |
|  | b) |  | | | | | | |
|  | c) |  | | | | | | |
|  | d) | ] | | | | | | |
| 105. | The rate constant for a chemical reaction has units ,order of the reaction will be | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 3 |
| 106. | Activation energy of a chemical reaction can be determined by | | | | | | | |
|  | a) | Evaluating rate constant at standard temperatures | | | | | | |
|  | b) | Evaluating velocities of reaction at two different temperatures | | | | | | |
|  | c) | Evaluating rate constants at two different temperatures | | | | | | |
|  | d) | Changing concentration of reactants | | | | | | |
| 107. | Which statement about molecularity of a reaction is wrong? | | | | | | | |
|  | a) | It is the number of molecules of the reactants taking part in a single step of reaction | | | | | | |
|  | b) | It is calculated from the reaction mechanism | | | | | | |
|  | c) | It may be either whole number or fractional | | | | | | |
|  | d) | None of the above | | | | | | |
| 108. | Arrhenius equation may not be represented as | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 109. | The reaction is carried out in a vessel and vessel separately. The ratio of the reaction velocities will be | | | | | | | |
|  | a) | 1:8 | b) | 1:4 | c) | 4:1 | d) | 8:1 |
| 110. | The rate for the reaction, is given by rate =k[RCl],the freezing point of the reaction is | | | | | | | |
|  | a) | Unaffected by increasing the temperature of the reaction | | | | | | |
|  | b) | Decreased on increasing the temperature of the reaction | | | | | | |
|  | c) | Halved on reducing the concentration of RCl to half | | | | | | |
|  | d) | Doubled on doubling the concentration of NaOh | | | | | | |
| 111. | In the sequence of reaction,  then the rate determining step of reaction is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 112. | A first order reaction is 20% complete in 10 min. What is the rate constant of the reaction? | | | | | | | |
|  | a) | 0.223 | b) | 0.0223 | c) | 0.322 | d) | 0.0322 |
| 113. | The activation energy of exothermic reaction 80 kJ . The heat of reaction is 200 kJ. The activation energy for the reaction (in kJ ) will be | | | | | | | |
|  | a) | 80 | b) | 120 | c) | 40 | d) | 280 |
| 114. | An endothermic reaction has an activation energy of 15 kcal/mol and the energy of reaction is 5 kcal/mol. The activation energy for the reaction is | | | | | | | |
|  | a) | 20 kcal/mol | b) | 15 kcal/mol | c) | 10 kcal/mol | d) | Zero |
| 115. | for a zero order reaction is If the concentration of the reactant after 25 sec is the initial concentration must have been: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 116. | Rate constant for a reaction is. The to leave 25% reaction is | | | | | | | |
|  | a) | 693 s | b) | 1386 s | c) | 6930 s | d) | 2029 s |
| 117. | By increase in temperature by 10 K, the rate of reaction becomes double. How many times the rate of reaction will be if the temperature is increased from 303K to 353 K? | | | | | | | |
|  | a) | 4 | b) | 8 | c) | 16 | d) | 32 |
| 118. | Temperature coefficient of a reaction is 2. When temperature is increased from to , rate of the reaction increases by | | | | | | | |
|  | a) | 128 times | b) | 100 times | c) | 500 times | d) | 250 times |
| 119. | The activation energy of a reaction is 9 kcal/mol. The increase in the rate constant when its temperature is raised from 295 to 300 K is approximately | | | | | | | |
|  | a) | 10% | b) | 50% | c) | 100% | d) | 28% |
| 120. | For a reaction , rate of disappearance of ‘A’ is related to the rate of appearance of B by the expression | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 121. | For a first order reaction, products, the concentration of changes from to in 40 minutes. The rate of reaction when the concentration of is is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 122. | In a 1st order reaction, reactant concentration C varies with time t as | | | | | | | |
|  | a) | 1/C increases linearly with t | | | b) | Log C decreases linearly with t | | |
|  | c) | C decreases with 1/t | | | d) | Log C decreases with 1/t | | |
| 123. | The rate constant of a zero order reaction is If the concentration of the reactant after min is Then its initial concentration would be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 124. | For a chemical reaction the rate of appearance of is The rate of disappearance of will be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 125. | For a reaction, the half-life period is 10 min. in what period of time would the concentration of X be reduce to 10% of original concentration? | | | | | | | |
|  | a) | 20 min | b) | 33 min | c) | 15 min | d) | 25 min |
| 126. | When is the activation energy for the decomposition of as,  If the values of rate constant at and rate constant | | | | | | | |
|  | a) | 112.5 kJ | b) | 200 kJ | c) | 149.5 kJ | d) | 11.25 kJ |
| 127. | Rate equation for a second order reaction is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 128. | Which of the following statements are correct?  1.Order of a reaction can be known from experimental result and not from the stoichiometry of reaction  2. Overall molecularity of a reaction may be determined in a manner similar to overall order of reaction  3. Overall order of reaction,  is  4.Molecularity of a reaction refers to  (i)Molecularity of each of the elementary steps (slow steps) in a multistep reaction  (ii) Molecularity of that particular step in a single step reaction  Select the correct answer by using the codes given below | | | | | | | |
|  | a) | 1, 3 and 4 | b) | 1, 2 and 3 | c) | 2, 3 and 4 | d) | 1, 2 and 4 |
| 129. | For the order reaction with rate constant ‘K’ and initial concentration ‘a’, the half-life period given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 130. | For the reaction , , the order of reaction is | | | | | | | |
|  | a) | One with respect[B] | | | b) | Two with respect to [A] | | |
|  | c) | Three | | | d) | Cannot be predicted | | |
| 131. | Which expression is wrong for fist order reaction? | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | Rate=k[A] | | |
| 132. | For a first order reaction, the half-life period is | | | | | | | |
|  | a) | Dependent on the square of the initial concentration. | | | | | | |
|  | b) | Dependent on first power of initial concentration. | | | | | | |
|  | c) | Dependent on the square root of initial concentration. | | | | | | |
|  | d) | Independent on initial concentration | | | | | | |
| 133. | Give relation between half reaction time and initial concentration of reactant for order reaction. | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 134. | For a first order reaction Product, the initial concentration of is and after 40 minute it becomes Calculate the rate of reaction at reactant concentration of | | | | | | | |
|  | a) |  | | | | | | |
|  | b) |  | | | | | | |
|  | c) |  | | | | | | |
|  | d) |  | | | | | | |
| 135. | Rate of reaction | | | | | | | |
|  | a) | Decreases with increase in temperature | | | | | | |
|  | b) | Increases with increase in temperature | | | | | | |
|  | c) | May increase or decrease with increase in temperature | | | | | | |
|  | d) | Does not depends on temperature | | | | | | |
| 136. | For the first order reaction with the rate constant which expression gives the rate half-life period? (Initial conc. = ) | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 137. | The rate constant of one of the reaction is found to be double that of the rate constant of another reaction. Then the relationship between the corresponding activation energies of the two reaction can be represented as | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 138. | For a given reaction of first order, it takes 15 minute for the concentration to drop from to The time required for the concentration to drop from to will be: | | | | | | | |
|  | a) | 60 minute | b) | 15 minute | c) | 7.5 minute | d) | 30 minute |
| 139. | The rate constant for a second order reaction is How long will it take a solution to be reduced to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 140. | The slope in Arrhenius plot, is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of the above |
| 141. | The rate constants and for two different reactions are and respectively. The temperature at which is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 142. | If the volume of the vessel in which the reaction is occurring is diminished to 1/3rd of its initial volume. The rate of the reaction will be increased by | | | | | | | |
|  | a) | 3 times | b) | 9 times | c) | 27 times | d) | 36 times |
| 143. | The time for half-life period of a creation reaction products is 1 h. when the initial concentration of the reactant ‘A’, is , how much time does it take for its concentration to come from 0.50 to , if it is a zero order reaction? | | | | | | | |
|  | a) | 4 h | b) | 0.5 h | c) | 0.25 h | d) | 1 h |
| 144. | For a reaction, if the concentration of A is doubled without altering the concentration of B, the rate gets doubled. If the concentration of B is increased by nine times without altering the concentration of A, the rate gets tripled. The order of the reaction is | | | | | | | |
|  | a) | 2 | b) | 1 | c) | 3/2 | d) | 4/3 |
| 145. | What fraction of a reactant showing first order remains after 40 minute if is 20 minute? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 146. | At 500 k, the half-life period of a gaseous reaction at an initial pressure of 80 kPa is 350 s. when the pressure is 40 kPa, the half-life period is 175 s. The order of the reaction is | | | | | | | |
|  | a) | Zero | b) | One | c) | Two | d) | Three |
| 147. | Which of the following statements are incorrect? | | | | | | | |
|  | a) | Rate of the reaction involving conversion of hydrogen to hydrogen | | | | | | |
|  | b) | Rate of the reaction involving the thermal decomposition of acetaldehyde | | | | | | |
|  | c) | In the formation of phosgene from and the rate of the reaction | | | | | | |
|  | d) | In the decomposition of the rate of reaction | | | | | | |
| 148. | At 373 K, a gaseous reaction is found to be of first order. Starting with pure the total pressure at the end of 10 min was 176 mm and after a long time when was completely dissociated, it was 270 mm. The pressure of at the end of 10 min was | | | | | | | |
|  | a) | 94 mm | b) | 47 mm | c) | 43 mm | d) | 90 mm |
| 149. | For a reversible reaction, , which one of the following statements is wrong from the given energy profile diagram? | | | | | | | |
|  | a) | Activation energy of forward reaction is greater than backward reaction | | | | | | |
|  | b) | The forward reaction is endothermic | | | | | | |
|  | c) | The threshold energy is less than that of activation energy | | | | | | |
|  | d) | The energy of activation of forward reaction is equal to the sum of heat of reaction and the energy of activation of backward reaction | | | | | | |
| 150. | Which one of the following is wrongly matched? | | | | | | | |
|  | a) | Saponification of -second order reaction | | | | | | |
|  | b) | Hydrolysis of -pseudo unimolecular | | | | | | |
|  | c) | Decomposition of -first order reaction | | | | | | |
|  | d) | Combination of to give HBr -first order reaction | | | | | | |
| 151. | For the reaction,  If the concentration of increase by in 100 s then the rate of the reactions | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 152. | The rate of the reaction product, at the initial concentration of is nine times its rate at another initial concentration of . The order of the reaction is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 153. | The half-life period for zero order reaction product, is 100 min. How long will it take in 80% completion? | | | | | | | |
|  | a) | 80 min | b) | 160 min | c) | 100 min | d) | 200 min |
| 154. | Consider the reaction  When concentration of B alone was doubled, the half-life did not change. When the concentration of A alone was doubled, the rate increased by two times. The unit of rate constant for this reaction is | | | | | | | |
|  | a) |  | b) | No unit | c) |  | d) |  |
| 155. | The expression for rate constant of a first order chemical reaction is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 156. | In gaseous reactions important for the understanding of the upper atmosphere and react bimolecularly to form two radicals. for this reaction is at and is then for the bimolecular recombination of two radicals to form and is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 157. | Activation energy of a reaction | | | | | | | |
|  | a) | Is independent of temperature | | | | | | |
|  | b) | Increases with temperature | | | | | | |
|  | c) | Gets doubled for every 10 degree rise in temperature | | | | | | |
|  | d) | Decreases with temperature | | | | | | |
| 158. | For a I order reaction the reaction rate at reactant concentration is found to be The half-life period of the reaction is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 159. | For a zero order reaction, the plot of concentration of reactant vs time is (intercept refers to concentration axis) | | | | | | | |
|  | a) | Liner with positive slope and zero intercept | | | | | | |
|  | b) | Linear with negative slope and zero intercept | | | | | | |
|  | c) | Linear with negative slope and non-zero intercept | | | | | | |
|  | d) | Linear with positive slope and non-zero intercept | | | | | | |
| 160. | The rate of reaction between two reactants and decreases by a factor if the concentration of reactant is doubled. The order of this reaction with respect to is: | | | | | | | |
|  | a) |  | b) |  | c) | 2 | d) | 1 |
| 161. | The velocity constant of a reaction at 290 K was found to be at 300 K, it will be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 162. | The term in a rate equation refers to | | | | | | | |
|  | a) | The decrease in concentration of the reactant with time | | | | | | |
|  | b) | The concentration of the reactant | | | | | | |
|  | c) | The change in concentration of the reactant | | | | | | |
|  | d) | The velocity constant of the reaction | | | | | | |
| 163. | In a first order reaction the concentration of reactant decreases from 800 to 50 in s. The rate constant of reaction in is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 164. | Consider the chemical reaction,  The rate of this reaction can be expressed in terms of time derivative of concentration of and Identify the correct relationship amongst the rate expressions: | | | | | | | |
|  | a) |  | | | | | | |
|  | b) |  | | | | | | |
|  | c) |  | | | | | | |
|  | d) |  | | | | | | |
| 165. | Rate of reaction can be expressed by following rate expression, rate=, if concentration of A is increased by 3 times and concentration of B is increased by 2 times, how many times rate of reaction increases? | | | | | | | |
|  | a) | 9 times | b) | 27 times | c) | 18 times | d) | 8 times |
| 166. | As the reaction progresses, the rate of reaction | | | | | | | |
|  | a) | Increases | | | b) | Decreases | | |
|  | c) | Remains constant | | | d) | First increases, then decreases | | |
| 167. | The data for the reaction, A+B→C   |  |  |  |  | | --- | --- | --- | --- | | Ex |  |  | Initial rate | | 1 | 0.012 | 0.035 | 0.10 | | 2 | 0.024 | 0.070 | 0.80 | | 3 | 0.024 | 0.035 | 0.10 | | 4 | 0.012 | 0.070 | 0.80 |   The rate law corresponds to the above data is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 168. | In a reaction, when the concentration of reactant is increased two times, the increase in rate of reaction was four times. Order of reaction is | | | | | | | |
|  | a) | Zero | b) | 1 | c) | 2 | d) | 3 |
| 169. | For the reaction  The rate of change of concentration for hydrogen is  The rates of change of concentration of ammonia is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 170. | Which of the following statement is in accordance with collision theory?  Rate is directly proportional to collision frequency  Rate depend upon orientation of atoms  Temperature determines the rate | | | | | | | |
|  | a) | Only III | | | b) | Only I and II | | |
|  | c) | Only II and III | | | d) | All of these | | |
| 171. | .  The activation energy for the forward reaction is 50 kcal. What is the activation energy for the backward reaction? | | | | | | | |
|  | a) | -72 kcal | b) | -28 kcal | c) | +28 kcal | d) | +72 kcal |
| 172. | According to collision theory: | | | | | | | |
|  | a) | Collisions are sufficiently violent | | | | | | |
|  | b) | All collision are responsible for reaction | | | | | | |
|  | c) | All collisions are effective | | | | | | |
|  | d) | Only highly energetic molecules have enough energy to react | | | | | | |
| 173. | The rate constant of a first order reaction whose half-life is 480 s is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 174. | It would be a zero order reaction when: | | | | | | | |
|  | a) | The rate of reaction is proportional to square of conc. of | | | | | | |
|  | b) | The rate of reaction remains same at any conc. of | | | | | | |
|  | c) | The rate remains unchanged at any conc. of and | | | | | | |
|  | d) | The rate of reaction doubles if conc. of is increased to double | | | | | | |
| 175. | For a reaction rate is given by  The order of reaction is: | | | | | | | |
|  | a) | 3 | b) | 6 | c) | 5 | d) | 7 |
| 176. | Rate constant for a reaction is Average life is represent by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 177. | The plot between concentration versus time for a zero order reaction is represented by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 178. | For the decomposition of it is given that:  Activation energy  Activation energy  then; | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 179. | During the kinetic study of the reaction following results were obtained.   |  |  |  |  | | --- | --- | --- | --- | | Run | in | in | Initial rate of formation of D in | | I |  |  |  | | II |  |  |  | | III |  |  |  | | IV |  |  |  |   On the basis of above data which one is correct: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 180. | If the reaction rate at a given temperature becomes slower then | | | | | | | |
|  | a) | The free energy of activation is higher | | | | | | |
|  | b) | The free energy of activation is lower | | | | | | |
|  | c) | The entropy changes | | | | | | |
|  | d) | The initial concentration of the reactants remains constant | | | | | | |
| 181. | 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) | All of the above | | | | | | |
| 182. | For the reaction system,  Volume is suddenly reduced to half its value by increasing the pressure on it. If the reaction is of first order with respect to and second order with respect to NO; the rate of reaction will | | | | | | | |
|  | a) | Diminish to one –fourth of its initial value | | | b) | Diminish to one –eighth of its initial value | | |
|  | c) | Increase to eight time of its initial value | | | d) | Increase to four time of its initial value | | |
| 183. | The reaction,  is : | | | | | | | |
|  | a) | Biomolecular reaction | | | | | | |
|  | b) | II order reaction | | | | | | |
|  | c) | Both (a) and (b) | | | | | | |
|  | d) | None of these | | | | | | |
| 184. | Which is correct relation in between and where and represent concentration, mole and pressure terms for gaseous phase reactant product? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | All of the above |
| 185. | The rate constant of a reaction is found to be . The order of reaction is | | | | | | | |
|  | a) | Zero | b) | 1 | c) | 2 | d) | 1.5 |
| 186. | A reactant forms two products :  If , than and are related as | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 187. | For the reaction , the rate Law given is | | | | | | | |
|  | a) |  | b) | [B] | c) |  | d) | [B] |
| 188. | For producing the effective collisions the colliding molecules must have: | | | | | | | |
|  | a) | A certain minimum amount of energy | | | | | | |
|  | b) | Energy lesser than threshold energy | | | | | | |
|  | c) | Improper orientation | | | | | | |
|  | d) | Proper orientation and energy equal or greater than threshold energy | | | | | | |
| 189. | The chemical reaction proceeds as follows  (fast)  (slow)  The rate law expression should be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | Unpredictable |
| 190. | Two substances and are present such that and half-life of is 5 minute and of is 15 minute. If they start decaying at the same time following first order, how much time later will the concentration of both of them would be same? | | | | | | | |
|  | a) | 15 minute | b) | 10 minute | c) | 5 minute | d) | 12 minute |
| 191. | A reaction involving A, B and C as reactants is found to obey the rate law, rate=. When the concentration of A, B and C are doubled separately, the rate is also found to increase two, zero and four times respectively. The overall order of the reaction is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 192. | The rate constant of order has units: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 193. | The reaction; in is of first order for with rate constant  What is the value of rate of reaction when ? | | | | | | | |
|  | a) |  | | | | | | |
|  | b) |  | | | | | | |
|  | c) |  | | | | | | |
|  | d) |  | | | | | | |
| 194. | can be taken as the time taken for the concentration of reactant to drop to of its initial value. If the rate constant for a first order reaction is k the can be written as | | | | | | | |
|  | a) | 0.75 /k | b) | 0.69 /k | c) | 0.29 /k | d) | 0.10 /k |
| 195. | In a chemical reaction two reactants take part. The rate of reaction is directly proportion to the concentration of one of them and inversely proportional to the concentration of the other. The order of reaction is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 4 |
| 196. | Which of the following is not the example of pseudo unimolecular reaction? | | | | | | | |
|  | a) |  | | | b) | Glucose fructose | | |
|  | c) |  | | | d) |  | | |
| 197. | The differential rate law for the reaction, | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 198. | give stable mercury by - emission. What amount of mercury will left after 260 h? | | | | | | | |
|  | a) | 0.9375 g | b) | 0.3758 g | c) | 0.7586 g | d) | 0.9000 g |
| 199. | The rate law for the chemical reaction  CLis rate =k[Cl].The rate determining step is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 200. | The rate law for the reaction  is given by The rate of this reaction | | | | | | | |
|  | a) | Is doubled by doubling the concentration of | | | | | | |
|  | b) | Is halved by reducing the concentration of by one half | | | | | | |
|  | c) | Is increased by increasing the temperature of the reaction | | | | | | |
|  | d) | In unaffected by change in temperature | | | | | | |
| 201. | The rate constant of a reaction increases by 5% when its temperature is raised from The activation energy of the reaction is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 202. | ………… of a reaction cannot be determined experimentally. | | | | | | | |
|  | a) | Order | b) | Rate | c) | Rate of constant | d) | Molecularity |
| 203. | A first order reaction is carried out with an initial concentration of 10 mole per litre and of the reactant changes into the product. Now if the same reaction is carried out with an initial concentration of 5 mol per litre the percentage of the reactant changing to the product is: | | | | | | | |
|  | a) | 40 | b) | 80 | c) | 160 | d) | Cannot be calculated |
| 204. | For a reaction of the type products, it is observed that doubling the concentration of causes the reaction rate to be four times as great but doubling the amount of does not affect the rate The rate equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 205. | Which increases on increase of temperature? | | | | | | | |
|  | a) | Energy of activation () | | | b) | Collision frequency () | | |
|  | c) | Rate constant () | | | d) | Both (a) and (c) | | |
| 206. | In the first order reaction, the concentration of the reactants is reduced to 25% in one hour. The half-life period of the reaction is | | | | | | | |
|  | a) | 2h | b) | 4h | c) | 1/2h | d) | 1/4h |
| 207. | In the given graph the activation energy, for the reverse reaction will be<br /><img src="207\_Q.gif" > | | | | | | | |
|  | a) | 150 kJ | b) | 50 kJ | c) | 200 kJ | d) | 100 kJ |
| 208. | What is the order of a reaction which has a rate expression rate | | | | | | | |
|  | a) |  | b) | Zero | c) |  | d) | None of these |
| 209. | For a fist order reaction, the concentration changes from 0.8 to 0.4 in 15 min. The time taken for the concentration to change from 0.1 M to 0.025 M is | | | | | | | |
|  | a) | 30 Min | b) | 15 Min | c) | 7.5 min | d) | 60 min |
| 210. | Give the hypothetical reaction mechanism<br /><img src="210\_Q.gif" > | | | | | | | |
|  | a) | Step I | b) | Step II | c) | Step III | d) | Step IV |
| 211. | For the activation energy of the forward reaction is The activation energy for backward reaction is …. | | | | | | | |
|  | a) | 65 | b) | 105 | c) | 85 | d) | 40 |
| 212. | For the reaction the rate <br /><img src="212\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 213. | The reaction is started with After 30 and 90 min, 5.0 g and 1.25 g of respectively are left. The order of the reaction is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 3 |
| 214. | The rate of a reaction is expressed in different ways as follows<br /><img src="214\_Q.gif"<br />  The reaction is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 215. | The rate of elementary reaction, increases by 100 times when the concentration of is increased ten folds. The order of the reaction with respect to is: | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 10 | d) | 100 |
| 216. | The differential rate law for the reaction is | | | | | | | |
|  | a) | <img src="216\_A1.gif" > | | | b) | <img src="216\_A2.gif" > | | |
|  | c) | <img src="216\_A3.gif" > | | | d) | <img src="216\_A4.gif" > | | |
| 217. | For the reaction when concentration of is made 1.5 times, the rate of reaction becomes 1.837 times. The order of reaction is | | | | | | | |
|  | a) | 1 | b) | 1.5 | c) | 2 | d) | 2.5 |
| 218. | For the reaction,,the initial concentration of was 0.20 mol and the concentration after 20 min was 0.20 mol .Then the rate of formation of in mol would be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 219. | The energies of activation for forward and reverse reactions for are 180 kJ and 200 kJ respectively. The presence of a catalyst lowers the activation energy of both (forward and reverse) reactions by 100 kJ . The enthalpy change of the reaction () in the presence of catalyst will be (in kJ ) | | | | | | | |
|  | a) | 300 | b) | 120 | c) | 280 | d) | 20 |
| 220. | Which statement is correct? | | | | | | | |
|  | a) | Reactions with low activation energy are usually exothermic | | | | | | |
|  | b) | The rate law sometimes enable to deduce the mechanism of a reaction | | | | | | |
|  | c) | The rate law for reaction is an algebraic expression relating the forward reaction rate to product concentration | | | | | | |
|  | d) | Increase in the total pressure of a gas phase reaction increase the fraction of collisions effective in producing reactions | | | | | | |
| 221. | The temperature coefficient of a reaction is: | | | | | | | |
|  | a) | The rate constant at a fixed temperature | | | | | | |
|  | b) | The ratio of rate constant at two temperature | | | | | | |
|  | c) | The ratio of rate constant differing by preferably and | | | | | | |
|  | d) | None of the above | | | | | | |
| 222. | The term in rate equation refers to: | | | | | | | |
|  | a) | The concentration of a reactant | | | | | | |
|  | b) | The decrease in concentration of the reactant with time | | | | | | |
|  | c) | The velocity constant of reaction | | | | | | |
|  | d) | None of the above | | | | | | |
| 223. | For a first order reaction, the initial concentration of a reactant is 0.05 M. After 45 min it is decreased by 0.015 M. calculation half reaction time | | | | | | | |
|  | a) | 87.42 min | b) | 25.90 min | c) | 78.72 min | d) | 77.20 min |
| 224. | The order of a gaseous phase reaction for which rate becomes half if volume of container having same amount of reactant is doubled is: | | | | | | | |
|  | a) | 1 | b) |  | c) | 2 | d) |  |
| 225. | For the reaction, <img src="225\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 226. | Temperature dependent equation can be written as | | | | | | | |
|  | a) | <img src="226\_A1.gif" > | | | b) | <img src="226\_A2.gif" > | | |
|  | c) | <img src="226\_A3.gif" > | | | d) | None of these | | |
| 227. | A first order reaction is 50% complete in 30 min at and in 10 min at The energy of activation of the reaction is | | | | | | | |
|  | a) | 52.8 kJ | b) | 23.6 kJ | c) | 29.5 kJ | d) | 43.8 kJ |
| 228. | Increase in the concentration of the reactants leads to the change in | | | | | | | |
|  | a) | Activation energy | | | b) | Heat of reaction | | |
|  | c) | Collision frequency | | | d) | Threshold energy | | |
| 229. | When a graph is plotted between for a first order reaction, a straight line is obtained. The slope of the line is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 230. | For the two gaseous reactions, following data are given<br /><br />The temperature at which becomes equal to is | | | | | | | |
|  | a) | 400 K | b) | 1000 K | c) | 800 K | d) | 1500 K |
| 231. | Hydrogenation of vegetable ghee at reduces pressure of from 2 to in 50 minute. The rate of reaction in terms of molarity per second is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 232. | In the reaction products, if is taken in excess, then it is an example of | | | | | | | |
|  | a) | Second order reaction | | | b) | Zero order reaction | | |
|  | c) | Pseudounimolecular reaction | | | d) | First order reaction | | |
| 233. | The rate of a chemical reaction depends upon: | | | | | | | |
|  | a) | Time | b) | Pressure | c) | Concentration | d) | All of these |
| 234. | The rate constant for the reaction,<br /> is If the rate is then the concentration of is | | | | | | | |
|  | a) | 1.4 | b) | 1.2 | c) | 0.04 | d) | 0.8 |
| 235. | The following data are for the decomposition of ammonium nitrite in aqueous solution.<img src="235\_Q.gif" > | | | | | | | |
|  | a) | Zero | b) | One | c) | Two | d) | Three |
| 236. | For a reaction Product, rate law is The concentration of left after time when is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 237. | For a first order reaction, the temperature dependent rate constant was found to follow the equation.<br /><br />The pre-exponential factor and the activation energy , respectively, are | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 238. | <img src="240\_Q.gif" > | | | | | | | |
|  | a) | Boltzmann factor | b) | Frequency factor | c) | Activation factor | d) | None of these |
| 239. | Among the following reaction, the fastest one is: | | | | | | | |
|  | a) | Burning of coal | | | | | | |
|  | b) | Rusting of iron in moist air | | | | | | |
|  | c) | Conversion of monoclinic to rhombic | | | | | | |
|  | d) | Precipitation of silver chloride by mixing silver nitrate and sodium chloride solutions | | | | | | |
| 240. | The following homogeneous gaseous reactions were experimentally found to be second order overall.<img src="240\_Q.gif" > | | | | | | | |
|  | a) | 3 only | b) | 1 and 3 | c) | 1 and 4 | d) | 3 and 4 |
| 241. | Consider a reaction;  When concentration of both the reactants G and H is doubled, the rate increases by eight times. However, when concentration of G is doubled keeping the concentration of H fixed, the rate is doubled. The overall of the reaction, | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 3 |
| 242. | The rate constant for a zero order reaction is | | | | | | | |
|  | a) | <img src="242\_A1.gif" > | b) | <img src="242\_A2.gif" > | c) | <img src="242\_A3.gif" > | d) | <img src="242\_A4.gif" > |
| 243. | The ratio of the times for 99.9% of the reaction to complete and half of the reaction to complete is | | | | | | | |
|  | a) | 2 | b) | 4 | c) | 8 | d) | 10 |
| 244. | The activation energy for a simple chemical reaction is in forward direction. The activation energy for the reverse reaction | | | | | | | |
|  | a) | Is negative of | | | b) | Is always less than | | |
|  | c) | Can be less than or more than | | | d) | Is always double of | | |
| 245. | After how many second will the concentration of the reactant in a first order reaction be halved if the rate constant is ? | | | | | | | |
|  | a) | 600 | b) | 100 | c) | 60 | d) | 10 |
| 246. | For the reaction the rate of reaction at a given instant can be given by | | | | | | | |
|  | a) | <img src="246\_A1.gif" > | | | b) | > | | |
|  | c) | > | | | d) | > | | |
| 247. | Which of the following theory is not related to chemical kinetics? | | | | | | | |
|  | a) | Collision theory | | | | | | |
|  | b) | Activated complex theory | | | | | | |
|  | c) | Absolute reaction rate theory | | | | | | |
|  | d) | VSPER theory | | | | | | |
| 248. | For the chemical change it is found that the rate of reaction doubles when the concentration is increased by 4 times. The order of the reaction is | | | | | | | |
|  | a) | One | b) | Two | c) | Half | d) | None of these |
| 249. | If a certain reaction is first order with respect to second order with respect to and zero order with respect to then what is the order of reaction? | | | | | | | |
|  | a) | First | b) | Second | c) | Third | d) | Zero |
| 250. | If a plot of versus t give a straight line for a given reaction, then the reaction is | | | | | | | |
|  | a) | Zero order | b) | First order | c) | Second order | d) | Third order |
| 251. | The given reaction<br /> is an example of | | | | | | | |
|  | a) | Third order reaction | | | b) | Second order reaction | | |
|  | c) | First order reaction | | | d) | None of these | | |
| 252. | <img src="254\_Q.gif" > | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 3 |
| 253. | The inversion of cane sugar into glucose and fructose is: | | | | | | | |
|  | a) | I order | b) | II order | c) | III order | d) | Zero order |
| 254. | <img src="254\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 255. | <img src="255\_Q.gif" > | | | | | | | |
|  | a) | and | | | | | | |
|  | b) | and | | | | | | |
|  | c) | and | | | | | | |
|  | d) | and | | | | | | |
| 256. | If the concentration units are reduced by times, then the value of rate constant of first order will: | | | | | | | |
|  | a) | Increase by times | | | | | | |
|  | b) | Decrease by factor of | | | | | | |
|  | c) | Not change | | | | | | |
|  | d) | None of these | | | | | | |
| 257. | Unit of frequency factor is | | | | | | | |
|  | a) | mol/L | | | b) | mol/L | | |
|  | c) | Depends upon order of reaction | | | d) | It does not have any unit | | |
| 258. | The ionic reactions are usually very fast because: | | | | | | | |
|  | a) | It does not involve bond breaking | | | | | | |
|  | b) | The energy of activation between charged ions is greater than that between neutral molecules | | | | | | |
|  | c) | Collision frequency is very low | | | | | | |
|  | d) | The reactions are highly exothermic | | | | | | |
| 259. | In the first order reaction, 75% of the reactant gets disappeared in 1.386h. The rate constant of the reaction is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 260. | Number of mole of a substance present in 1 litre volume is known as: | | | | | | | |
|  | a) | Activity | b) | Molar concentration | c) | Active mass | d) | None of these |
| 261. | The rate of a reaction is doubled when temperature increases by. If temperature is increased by , then rate of reaction will become | | | | | | | |
|  | a) | 64 times | b) | 256 times | c) | 512 times | d) | 1024 times |
| 262. | For a hypothetical reaction <br /> is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 263. | The half-life of two samples is 0.1 and 0.4 s. Their reactive concentration is 200 and 50 respectively. What is the order of reaction? | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 1 | d) | 4 |
| 264. | <img src="264\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 265. | The reaction, exhibits: | | | | | | | |
|  | a) | Small negative temperature coefficient | | | | | | |
|  | b) | Decrease in value of with temperature | | | | | | |
|  | c) | Decrease in value of rate with temperature | | | | | | |
|  | d) | All of the above | | | | | | |
| 266. | Consider the reaction,<br /><img src="266\_Q.gif" > | | | | | | | |
|  | a) | (B) only | b) | Both (A) and (B) | c) | Neither (A) nor (B) | d) | (A)Only |
| 267. | In a reaction Products; the concentration of decreases from to in 10 minute. The rate of reaction during this interval is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 268. | What is the two third life of a first order reaction having | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 269. | In a Ist order reaction the concentration of reactant decreases from toin The rate constant of reaction in is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 270. | The rate constant of a first order reaction is How much time will it take to reduce the initial concentration to its 1/8thvalue ? | | | | | | | |
|  | a) | 100s | b) | 200s | c) | 300s | d) | 400s |
| 271. | In a reaction, the rate expression is, rate the order of reaction is: | | | | | | | |
|  | a) | 1 | b) | 2 | c) |  | d) | Zero |
| 272. | In the Synthesis of ammonia by Haber process, if 60 moles of ammonia is obtained in one hour, then the rate of disappearance of nitrogen is | | | | | | | |
|  | a) | 30 mol/min | b) | 6 mol/min | c) | 0.5 mol/min | d) | 60 mol/min |
| 273. | Half-life period of second order reaction is | | | | | | | |
|  | a) | Proportional to initial concentration of reactants | | | | | | |
|  | b) | Independent of initial concentration of reactants | | | | | | |
|  | c) | Inversely proportional to initial concentration of reactants | | | | | | |
|  | d) | None of the above | | | | | | |
| 274. | A reactant with initial concentration showing first order change takes 40 minute to become half. If it shows zero order change taking 20 minute to becomes half under the similar conditions, the ratio, for first order and zero order kinetics will be: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 275. | The reason for almost doubling the rate of reaction on increasing the temperature of the reaction system by is | | | | | | | |
|  | a) | The value of threshold energy increases | | | | | | |
|  | b) | Collision frequency increases | | | | | | |
|  | c) | The fraction of the molecules having energy equal to threshold energy increases | | | | | | |
|  | d) | Activation energy decreases | | | | | | |
| 276. | Plot of versus time is straight line. This indicates that the reaction is of: | | | | | | | |
|  | a) | Second order | b) | First order | c) | Zero order | d) | Third order |
| 277. | The of the first order reaction is | | | | | | | |
|  | a) | Dependent of initial concentration | | | b) | Directly proportional to initial concentration | | |
|  | c) | indirectly proportional to initial concentration | | | d) | Independent of initial concentration | | |
| 278. | In a zero-order reaction for every rise of temperature, the rate is doubled. If the temperature is increased from to the rate of the reaction will become: | | | | | | | |
|  | a) | 64 times | b) | 128 times | c) | 256 times | d) | 512 times |
| 279. | The time required for 100% completion of a zero order reaction is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 280. | The reaction, is | | | | | | | |
|  | a) | Bimolecular and second order | | | b) | Unimolecular and first order | | |
|  | c) | Bimolecular and first order | | | d) | Bimolecular and zero order | | |
| 281. | The thermal decomposition of a compound is of first order. If a sample of the compound decompose 50% in 120 min. What time will it take to undergo 90% decomposition? | | | | | | | |
|  | a) | Nearly 400 min | b) | Nearly 45 min | c) | Nearly 480 min | d) | Nearly 240 min |
| 282. | Which one of the following statements for the order of a reaction is incorrect? | | | | | | | |
|  | a) | Order of reaction is always a whole number | | | | | | |
|  | b) | Order can be determined only experimentally | | | | | | |
|  | c) | Order is not influenced by stoichiometric coefficient of the reactants | | | | | | |
|  | d) | Order of reaction is sum of power to the concentration terms of reactants to express the rate of reaction | | | | | | |
| 283. | The rate of chemical reaction depends on the nature of chemical reactions, because: | | | | | | | |
|  | a) | The threshold energy level differs from one reaction to another | | | | | | |
|  | b) | Some of the reactants are solid at room temperature | | | | | | |
|  | c) | Some of the reactants are coloured | | | | | | |
|  | d) | All of the above | | | | | | |
| 284. | If the rate of reaction between and is given by, rate then the reaction is: | | | | | | | |
|  | a) | First order in | | | | | | |
|  | b) | order in | | | | | | |
|  | c) | Overall order is | | | | | | |
|  | d) | All are correct | | | | | | |
| 285. | In a reaction, Product, rate is doubled when the concentration of is doubled, and rate increases by a factor of 8 when the concentrations of both the reactants ( and ) are doubled, rate law for the reaction can be written as: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 286. | Combustion of carbon is exothermic, but coal stored in coal depots does not burn automatically because of: | | | | | | | |
|  | a) | High threshold energy barrier | | | | | | |
|  | b) | Kinetic stability of coal | | | | | | |
|  | c) | Higher energy of activation needed for burning | | | | | | |
|  | d) | All of the above | | | | | | |
| 287. | A drop of a solution contains mol of If the rate of disappearance of is how long will it take for to disappear from the drop | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 288. | The inversion of cane sugar into glucose and fructose according to the equation  is an example of | | | | | | | |
|  | a) | First order reaction | | | b) | Third order reaction | | |
|  | c) | Second order reaction | | | d) | Zero order reaction | | |
| 289. | In the reversible reaction<br /><img src="289\_Q.gif" > | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 290. | For the reaction, the rate of change of concentration for hydrogen is The rate of change of concentration of ammonia is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 291. | In the reaction; which of the following expressions does not describe changes in the concentration of various species as a function of time? | | | | | | | |
|  | a) | <img src="291\_A1.gif" > | b) | <img src="291\_A2.gif" > | c) | <img src="291\_A3.gif" > | d) | <img src="291\_A4.gif" > |
| 292. | The order of reaction, with respect to one of the reacting component Y, is zero. In implies that | | | | | | | |
|  | a) | The reaction is going on at a constant rate. | | | | | | |
|  | b) | The rate of reaction does not very with temperature. | | | | | | |
|  | c) | The reaction rate is independent of the concentration of Y. | | | | | | |
|  | d) | The rate of formation of the activated complex is zero. | | | | | | |
| 293. | The rate of disappearance of in the reaction; is Then the rate of formation of is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 294. | For the first order reaction half-life is 14 s, the time required for the initial concentration to reduce to 1/8 of its value is | | | | | | | |
|  | a) |  | b) | 28 s | c) | 42 s | d) |  |
| 295. | Given that is the rate constant for some order of any reaction at temp. then the value of (where is the Arrhenius constsnt): | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 296. | The rate constant of a first order reaction is per second and initial concentration is 0.10 M. Then the initial rate of reaction is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 297. | With respect to the figure given below which of the following statements is correct? <br /><img src="297\_Q.gif" > | | | | | | | |
|  | a) | for the forward reaction is | | | | | | |
|  | b) | for the forward reaction is | | | | | | |
|  | c) |  | | | | | | |
|  | d) | (for reverse reaction) | | | | | | |
| 298. | For a first order reaction, products, the rate of reaction at is The half-life period for the reaction is | | | | | | | |
|  | a) | 476 s | b) | 496 s | c) | 832 s | d) | 242 s |
| 299. | From the following data, the activation energy for the reaction <br /><img src="299\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 300. | An elementary reaction is given as products. If concentration of is kept constant and concentration of is doubled then rate of reaction is: | | | | | | | |
|  | a) | Doubled | b) | Halved | c) | Quadrupled | d) | Remains same |
| 301. | The hydrolysis of ethyl acetate was carried out separately with The rate constants were found to be respectively then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 302. | Which one of the following statement for order of reaction is not correct ? | | | | | | | |
|  | a) | Order can be determined experimentally | | | | | | |
|  | b) | Order of reaction is equal to sum of the power of concentration terms in differential rate law | | | | | | |
|  | c) | It is not affected with stoichiometric coefficients of the reactants | | | | | | |
|  | d) | Order cannot be fractional | | | | | | |
| 303. | For a single step, reaction, Products, the molecularity is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 3 |
| 304. | Which of the following statement is correct for a reaction | | | | | | | |
|  | a) | The rate of disappearance of twice the rate of disappearance of | | | | | | |
|  | b) | The rate of disappearance of rate of appearance of products | | | | | | |
|  | c) | The rate of appearance of products the rate of disappearance of | | | | | | |
|  | d) | The rate of appearance of products the rate of disappearance of | | | | | | |
| 305. | For the reaction the rate law is; rate Which of the following statements is incorrect? | | | | | | | |
|  | a) | The reaction follows first order kinetics | | | | | | |
|  | b) | The of reaction depends upon initial concentration of reactant | | | | | | |
|  | c) | is constant for the reaction at a constant temperature | | | | | | |
|  | d) | The rate law provides a simple way of predicting the concentration of reactants and products at any times after the start of the reaction | | | | | | |
| 306. | For a first order reaction The time for completion of 50% reaction is | | | | | | | |
|  | a) | 1 milli-second | b) | 4 milli-second | c) | 7 mili-second | d) | 10 milli-second |
| 307. | 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 large 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 | | | | | | |
| 308. | Which statement is not correct? | | | | | | | |
|  | a) | For endothermic reactions, heat of reaction is lesser than energy of activation | | | | | | |
|  | b) | For exothermic reactions, heat of reaction is more than energy of activation | | | | | | |
|  | c) | For exothermic reactions energy of activation is less in forward reaction than in backward reaction | | | | | | |
|  | d) | For endothermic reactions energy of activation is more in forward reaction than in backward reaction | | | | | | |
| 309. | Which statement is true? | | | | | | | |
|  | a) | Endothermic reactions have higher activation energies than exothermic reactions | | | | | | |
|  | b) | The specific rate constant for a reaction is independent of the concentration of the reacting species | | | | | | |
|  | c) | There is a single rate determining step in any reaction mechanism | | | | | | |
|  | d) | None of the above | | | | | | |
| 310. | If rate contant at temperature and rate constant at temperature for a first order reaction, then which of the following relations is correct? | | | | | | | |
|  | a) | <img src="310\_A1.gif" > | | | b) | <img src="310\_A2.gif" > | | |
|  | c) | <img src="310\_A3.gif" > | | | d) | <img src="310\_A4.gif" > | | |
| 311. | What is the half-life of Na-24 if sample of it disintegrate at the rate of atoms per s? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 312. | The concentration of a reactant X decreases from 01 M to 0.005 m in 40 min. If the reaction follows first order kinetics, the rate of the reaction when the concentration of X is 0.01 M will be | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 313. | For zero order reaction the integrated rate equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 314. | The rate equation for the reaction is found to be Rate=k[A][B]<br />The correct statement in relation to this reaction that the | | | | | | | |
|  | a) | Unit of k must be | | | | | | |
|  | b) | is constant | | | | | | |
|  | c) | Rate of formation of C is twice the rate of disappearance of A | | | | | | |
|  | d) | Value of k is independent of the initial concentration of A and B | | | | | | |
| 315. | The unit of rate constant of second order reaction | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 316. | The rate constant for the first order reaction is How much time will it take to reduce the concentration of the reactant to value? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 317. | Rate constant of a chemical reaction can be kept constant by: | | | | | | | |
|  | a) | Stirring the compounds | | | | | | |
|  | b) | Keeping the temperature constant | | | | | | |
|  | c) | Both (a) and (b) | | | | | | |
|  | d) | None of the above | | | | | | |
| 318. | The rate of a chemical reaction doubled for every rise in temperature. If the temperature is increased by the rate of reaction increase by | | | | | | | |
|  | a) | 20 times | b) | 32 times | c) | 64 times | d) | 128 times |
| 319. | If is the initial concentration of the reactant, the half-life period of the reaction of order is proportional to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 320. | Rate of reaction depends upon | | | | | | | |
|  | a) | temperature | b) | catalyst | c) | concentration | d) | All of these |
| 321. | For a reaction, the rate of reaction was found to increase about 1.8 times when the temperature was increased by The increase in rate is due to: | | | | | | | |
|  | a) | Increase in number of active molecules | | | | | | |
|  | b) | Increase in activation energy of reactants | | | | | | |
|  | c) | Decrease in activation energy of reactants | | | | | | |
|  | d) | Increase in the number of collisions between reacting molecules | | | | | | |
| 322. | A hypothetical reaction follows the mechanism as given below,<br /> <img src="322\_Q.gif" > | | | | | | | |
|  | a) | 2 | b) | 1 | c) |  | d) | 0 |
| 323. | A chemical reaction proceeds following formula  Which of the following process will increase the rate of reaction? | | | | | | | |
|  | a) | Lowering of | | | b) | Lowering of | | |
|  | c) | Lowering of | | | d) | Independent of all the above factors | | |
| 324. | In the respect of the equation in chemical kinetics, which one of the following statements is correct? | | | | | | | |
|  | a) | is equilibrium constant | | | b) | is adsorption factor | | |
|  | c) | is energy of activation | | | d) | is Rydberg constant | | |
| 325. | <img src="325\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 326. | <img src="326\_Q.gif" > | | | | | | | |
|  | a) | Rate constant for forward reaction | | | | | | |
|  | b) | Rate constant for backward reaction | | | | | | |
|  | c) | Equilibrium constant for the reaction | | | | | | |
|  | d) | All of the above | | | | | | |
| 327. | For a reaction between gaseous compounds,<br /><br />The reaction rate=k[A][B]. If the volume of the container is made of the initial, then what will be the rate of reaction as compared to the initial rate? | | | | | | | |
|  | a) | 16 times | b) | 4 times | c) | 1/8 times | d) | 1/16 times |
| 328. | The rate constant for a first order reaction whose half-life, is 480 s is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 329. | If is the total number of collisions which a gas molecule register with others per unit time under particular conditions, then the collision frequency of the gas containing molecules per unit volume is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 330. | For a reaction, the rate constant is 2.34. The half-life period for reaction is | | | | | | | |
|  | a) | 0.30 s | b) | 0.60 s | c) | 3.3 s | d) | Data is insufficient |
| 331. | If “a” and “” are initial concentration of reactant and half-life of a zero order reaction respectively, which of the following is correct ? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 332. | The temperature dependence of rate constant () of a chemical reaction is written in terms of Arrhenius equation, . Activation energy () of the reaction can be calculated by plotting | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 333. | The rate constant of a reaction is given by  It means that | | | | | | | |
|  | a) |  | | | | | | |
|  | b) | will be a straight line with intercept on | | | | | | |
|  | c) | The number of effective collisions are | | | | | | |
|  | d) | Half-life of the reaction increases with increase of temperature | | | | | | |
| 334. | The unit of the rate of a second order reaction | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 335. | Rate of a reaction can be expressed of by following rate expression  Rate=k if concentration of A is reduced by half by what times concentration of B is to be increased to have same rate of reaction? | | | | | | | |
|  | a) | 4 times | b) | 2 times | c) | ¼ times | d) | 8 times |
| 336. | <img src="336\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 337. | For a certain reaction of order the time for half change is given by; where is rate constant is initial concentration. The value of is: | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 0 | d) | 0.5 |
| 338. | For a reaction between A and B, the initial rate of reaction is measured for various initial concentrations A and B. the data provided are<br /><img src="338\_Q.gif" > | | | | | | | |
|  | a) | One | b) | Two | c) | Two and half | d) | Three |
| 339. | Which order of reaction obeys the relation | | | | | | | |
|  | a) | First | b) | Second | c) | Third | d) | Zero |
| 340. | How much faster would a reaction proceed at than at if the activation energy is | | | | | | | |
|  | a) | 2 times | b) | 16 times | c) | 11 times | d) | 6 times |
| 341. | The activation energy of a reaction at a given temperature is found to be 2.303 . The ratio of rate constant to the Arrhenius factor is | | | | | | | |
|  | a) | 0.01 | b) | 0.1 | c) | 0.02 | d) | 0.001 |
| 342. | Consider an endothermic reaction with the activation energies for the backward and forward reactions respectively. In general | | | | | | | |
|  | a) | There is no definite relation between | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 343. | For the reaction at the point of intersection of two curves show, the is can be given by: <img src="343\_Q.gif" > | | | | | | | |
|  | a) | <img src="343\_A1.gif" > | b) | <img src="343\_A2.gif" > | c) | <img src="343\_A3.gif" > | d) | <img src="343\_A4.gif" > |
| 344. | The elementary step of the reaction, is found to follow III order kinetics, its molecularity is: | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 345. | Following mechanism has been proposed for a reaction,<br />…(Slow)…(fast)The rate law expression for the reaction is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 346. | Two first order reaction have half-lives in the ratio Calculate the ratio of time intervals The time and are the time period for and completion | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 347. | Order of a reaction can be | | | | | | | |
|  | a) | Fractional | b) | Zero | c) | Integer | d) | All of these |
| 348. | The half-life period for a zero order reaction is equal to | | | | | | | |
|  | a) | <img src="348\_A1.gif" > | b) | <img src="348\_A2.gif" > | c) | <img src="348\_A3.gif" > | d) | <img src="348\_A4.gif" > |
| 349. | In a reaction, the rate expression is. If the concentration of both the reaction is doubled at constant volume then the rate of the reaction will be | | | | | | | |
|  | a) | Eight time | b) | Double | c) | Quadruple | d) | Triple |
| 350. | For a gaseous reaction, the units of rate of rate of reaction are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 351. | The rate constant is given by the equation which factor should register a decrease for the reaction to proceed more rapidly? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 352. | The activation energy for most of the reactions is approximately 50 kJ . The value of temperature coefficient for such reactions is | | | | | | | |
|  | a) | > 2 | b) | >3 | c) | <1 | d) | >4 |
| 353. | The half-life period for a first order reaction is 693 s. The rate constant of this reaction would be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 354. | For the reaction under certain condition of temperature and partial pressure of the reactants, the rate of formation of is The rate of conversion of under same condition is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 355. | In a first order reaction if is the rate constant initial concentration of the reactant is then half-life is: | | | | | | | |
|  | a) | <img src="355\_A1.gif" > | b) | <img src="355\_A2.gif" > | c) | <img src="355\_A3.gif" > | d) | <img src="355\_A4.gif" > |
| 356. | A reaction follows a second order kinetics. Doubling the concentration of A will increase the rate of formation of B by a factor of | | | | | | | |
|  | a) | ¼ | b) | 4 | c) | ½ | d) | 2 |
| 357. | With increase in temperature, rate of reaction | | | | | | | |
|  | a) | increases | | | b) | decreases | | |
|  | c) | Remains same | | | d) | May increase or decrease | | |
| 358. | Which of the following statement is not correct? | | | | | | | |
|  | a) | In zero order reaction the rate of the reaction remains constant throughout. | | | | | | |
|  | b) | A second order reaction would become a pseudo first order reaction when one of the reactant is taken in large excess. | | | | | | |
|  | c) | The value of first order rate constant expends on the units of the concentration term used. | | | | | | |
|  | d) | In a first order reaction the plot of log (a-x) vs time gives a straight line. | | | | | | |
| 359. | A drop of solution (volume 0.05 ) contains If the rate constant of disappearance of is How long would it take for in drop to disappear? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 360. | For the reaction, products, the active mass of is kept constant, and that of is doubled. The rate of reaction will be then | | | | | | | |
|  | a) | Decrease 4 times | b) | Decrease 2 times | c) | Increase 4 times | d) | Increase 2 times |
| 361. | Which of the following expression is correct for second order reaction.refers to initial concentration of reactant)? | | | | | | | |
|  | a) | <img src="361\_A1.gif" > | b) | <img src="361\_A2.gif" > | c) | <img src="361\_A3.gif" > | d) | <img src="361\_A4.gif" > |
| 362. | A first order reaction is 10% complete in 20 min. The time taken for 19% completion is | | | | | | | |
|  | a) | 30 min | b) | 40 Min | c) | 50 min | d) | 38 min |
| 363. | A graph plotted between for calculating activation energy is shown by | | | | | | | |
|  | a) | <img src="363\_A1.gif" > | b) | <img src="363\_A2.gif" > | c) | <img src="363\_A3.gif" > | d) | <img src="363\_A4.gif" > |
| 364. | In the following reaction rate constant is Half-life and completion time of the given reaction are | | | | | | | |
|  | a) | 500 s, 1000 s | b) | 500 s, 750 s | c) | 250 s, 500 s | d) | 300 s, 600 s |
| 365. | A reaction was found to order with respect to the concentration of carbon monoxide. If the concentration of carbon monoxide is doubled, with everything else kept the same, the rate of reaction will | | | | | | | |
|  | a) | Remain unchanged | | | b) | Triple | | |
|  | c) | Increases by factor of four | | | d) | Double | | |
| 366. | The following data were obtained the first order decomposition of at a constant volume and at a particular temperature <br /><img src="366\_Q.gif" > | | | | | | | |
|  | a) | 0.0693 | b) | 69.3 | c) | 6.93 | d) |  |
| 367. | According to Arrhenius equation, the rate constant is related to temperature as | | | | | | | |
|  | a) | <img src="367\_A1.gif" > | | | b) | <img src="367\_A2.gif" > | | |
|  | c) | <img src="367\_A3.gif" > | | | d) | <img src="367\_A4.gif" > | | |
| 368. | Inversion of cane-sugar in dilute acid is a | | | | | | | |
|  | a) | Bimolecular reaction | | | b) | Pseudo-unimolecular reaction | | |
|  | c) | Unimolecular reaction | | | d) | Trimolecular reaction | | |
| 369. | Consider the reaction<br /><br />The equality relationship between and is: | | | | | | | |
|  | a) | <img src="369\_A1.gif" > | | | | | | |
|  | b) | <img src="369\_A2.gif" > | | | | | | |
|  | c) | <img src="369\_A3.gif" > | | | | | | |
|  | d) | <img src="369\_A4.gif" > | | | | | | |
| 370. | For a reaction when the rate was found to be On reducing concentration of to half, the rate changes to The order of reaction with respect to is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 371. | The units of the rate constant of a second order reaction are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 372. | A follows first order reaction , Aproduct Concentration of A, change from 0.1 M to 0.025 M in 40 min. find the rate of reaction of A when concentration of A is 0.01 M. | | | | | | | |
|  | a) | 3.47 | | | | | | |
|  | b) | 3.47 | | | | | | |
|  | c) | 1.73 | | | | | | |
|  | d) | 1.73 | | | | | | |
| 373. | In the reaction if the concentration of is doubled and of is halved, then the rate of the reaction will | | | | | | | |
|  | a) | Increase by two times | | | b) | Decrease by two times | | |
|  | c) | Increase by four times | | | d) | Remain the same | | |
| 374. | Energy of activation of an exothermic reaction is | | | | | | | |
|  | a) | Negative | b) | Positive | c) | Zero | d) | Can’t be predict |
| 375. | For a reaction, the rate constant is The half-life period for the reaction is | | | | | | | |
|  | a) | 0.30 s | b) | 0.60 s | c) | 3.3 s | d) | Data is insufficient |
| 376. | The rate of a reaction get doubles when the temperature changes from to By what factor will it change for the temperature change from | | | | | | | |
|  | a) | 1.81 | b) | 1.71 | c) | 1.91 | d) | 1.76 |
| 377. | Arrhenius equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 378. | Which rate expression suggests an over all order of for the reaction involving substances | | | | | | | |
|  | a) |  | | | | | | |
|  | b) |  | | | | | | |
|  | c) |  | | | | | | |
|  | d) |  | | | | | | |
| 379. | Rate of a reaction can be expressed by Arrhenius equation as<br />  In this equation, represents | | | | | | | |
|  | a) | The energy above which all the colliding molecules will react | | | | | | |
|  | b) | The energy below which colliding molecules will not react | | | | | | |
|  | c) | The total energy of the reacting molecules at a temperature, | | | | | | |
|  | d) | The fraction of molecules with energy greater than the activation energy of the reaction | | | | | | |
| 380. | The minimum energy required for a molecule to take part in a reaction is called | | | | | | | |
|  | a) | Threshold energy | b) | Nuclear energy | c) | Potential energy | d) | Kinetic energy |
| 381. | The rate of reaction becomes 2 times for every rise in temperature. How the rate of reaction will increase when temperature is increased from to | | | | | | | |
|  | a) | 16 | b) | 32 | c) | 64 | d) | 128 |
| 382. | In a gaseous phase reaction:< br /> the increase in pressure from 100 mm to 120 mm is noticed in 5 minute. The rate of disappearance of in is: | | | | | | | |
|  | a) | 4 | b) | 8 | c) | 16 | d) | 2 |
| 383. | The unit of rate constant of second order reaction is | | | | | | | |
|  | a) | Mol/Ls | b) | L / Mol s | c) |  | d) | Per second |
| 384. | The given reaction,<br /> is an example of: | | | | | | | |
|  | a) | First order reaction | | | | | | |
|  | b) | Third order reaction | | | | | | |
|  | c) | Second order reaction | | | | | | |
|  | d) | None of these | | | | | | |
| 385. | For the reaction, it is found that doubling the concentration of A increases the rate by four times and doubling the concentration of B doubles the reaction rate. What is the overall order of the reaction? | | | | | | | |
|  | a) | 4 | b) | 3/2 | c) | 3 | d) | 1 |
| 386. | The rate constant of a reaction is found to be double that of rate constant of another reaction. The relationship between corresponding activation energies of the two reactions at same temperature ( and ) can be represented as: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 387. | For the reaction, , the differential rate law is | | | | | | | |
|  | a) | <img src="387\_A1.gif" > | | | b) | <img src="387\_A2.gif" > | | |
|  | c) | <img src="387\_A3.gif" > | | | d) | <img src="387\_A4.gif" > | | |
| 388. | The time for half-life of a first order reaction is 1 hr. What is the time taken for completion of the reaction? | | | | | | | |
|  | a) | 1 hour | b) | 2 hour | c) | 3 hour | d) | 4 hour |
| 389. | DDT on exposure to water decomposes. Half-life is 10 yr. How much time it will take for its decomposition to 99%? | | | | | | | |
|  | a) | 50 yr | b) | 70 yr | c) | 500 yr | d) | 700 yr |
| 390. | In Arrhenius equation, may be called the rate constant at | | | | | | | |
|  | a) | Very low temperature | | | b) | Zero activation energy | | |
|  | c) | The boiling temperature of reaction mixture | | | d) | All of the above | | |
| 391. | The phenomenon of emission of visible light as a result of chemical change is known as | | | | | | | |
|  | a) | Chemiluminescence | | | b) | Fluorescence | | |
|  | c) | Phosphorescence | | | d) | Photosensitization | | |
| 392. | Chemical reactions with very high values are generally | | | | | | | |
|  | a) | Very fast | b) | Very slow | c) | Moderately fast | d) | Spontaneous |
| 393. | In the reaction , rate of reaction is equal to | | | | | | | |
|  | a) | <img src="393\_A1.gif" > | b) | <img src="393\_A2.gif" > | c) | <img src="393\_A3.gif" > | d) | <img src="393\_A4.gif" > |
| 394. | If the half-time for a particular reaction is found to be constant and independent of the initial concentration of the reactants, then the ratio is of | | | | | | | |
|  | a) | First order | b) | Zero order | c) | Second order | d) | None of these |
| 395. | Under the same reaction condition, initial concentration of of a substance become half in 40 s and 20 s through first order and zero order kinetics respectively. Ratio of the rate constants for first order ( and zero order of the reaction is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 396. | The order of a reaction with rate equal toC is <br /><img src="396\_Q.gif" > | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) | 2 |
| 397. | For reaction the rate constant and for the reaction the rate constant If andthen the temperature at which is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 398. | Which of these does not influence the rate of reaction? | | | | | | | |
|  | a) | Nature of the reactants | | | b) | Concentration of the reactants | | |
|  | c) | Temperature of the reaction | | | d) | Molecularity of the reaction | | |
| 399. | The concentration of R in the reaction RP was measured as a function of time and the following data is obtained <br /><img src="399\_Q.gif" > | | | | | | | |
|  | a) | Zero | b) | First | c) | Second | d) | Third |
| 400. | A graph plotted between concentration of reactant consumed at any time and time is found to be a straight line passing through the origin. Thus, reaction is of: | | | | | | | |
|  | a) | First order | b) | Zero order | c) | Third order | d) | Second order |
| 401. | Rate constant of a reaction depends upon | | | | | | | |
|  | a) | Speed of reaction | | | b) | Concentration of the reactants | | |
|  | c) | Pressure of the surrounding | | | d) | Temperature | | |
| 402. | An endothermic reaction has an activation energy as of If energy change of the reaction is the activation energy of the reverse reactions is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 403. | Consider the following statement in respect of zero order reaction.<br />The rate of the reaction is independent of reactant concentration. <br />The rate of the reaction is independent of temperature. <br />The rate constant of the reaction is independent of temperature. <br />The rate constant of reaction is independent of reactant cogeneration. <br />Choose the correct statements/s | | | | | | | |
|  | a) | I only | b) | I and II only | c) | III and IV only | d) | I and IV only |
| 404. | If concentration of reactants is increased by , the rate constant becomes: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 405. | The correct expression for the rate of reaction of elementary reaction, is: | | | | | | | |
|  | a) | <img src="405\_A1.gif" > | b) | <img src="405\_A2.gif" > | c) | <img src="405\_A3.gif" > | d) | <img src="405\_A4.gif" > |
| 406. | The threshold energy of a chemical reaction depends upon: | | | | | | | |
|  | a) | Nature of reacting species | | | | | | |
|  | b) | Temperature | | | | | | |
|  | c) | Concentration of species | | | | | | |
|  | d) | Number of collisions per unit time or collision frequency | | | | | | |
| 407. | A first order reaction has a half-life period of At reactant concentration, rate will be: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 408. | The rate constant for the reaction  is If the rate is then the concentration of is is | | | | | | | |
|  | a) | 0.4 | b) | 0.8 | c) | 1.2 | d) | 3.2 |
| 409. | The enzyme catalysed reaction is faster than metal catalysed reaction because its activation energy is: | | | | | | | |
|  | a) | Greater | b) | Lower | c) | Same | d) | None of these |
| 410. | Plots showing the variation of the rate constant () with temperature are given below. The plot that follows Arrhenius equation is | | | | | | | |
|  | a) | <img src="410\_A1.gif" > | b) | <img src="410\_A2.gif" > | c) | <img src="410\_A3.gif" > | d) | <img src="410\_A4.gif" > |
| 411. | For the following homogeneous reaction, the unit of rate constant is<br /><img src="411\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) | S | d) |  |
| 412. | If is the initial concentration of a substance which reacts according to zero order kinetics and is rate constant, the time for the reaction to go to completion is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 413. | What is the two third life of a first order reaction having ? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 414. | The velocity constant of a reaction at 290 K was found to be . When the temperature is raised to 310 K, it will be about | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 415. | For fourth order reaction, what is the unit of K? | | | | | | | |
|  | a) | <img src="415\_A1.gif" > | b) | <img src="415\_A2.gif" > | c) | <img src="415\_A3.gif" > | d) | <img src="415\_A4.gif" > |
| 416. | 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 |
| 417. | <img src="417\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 418. | <img src="418\_Q.gif" > | | | | | | | |
|  | a) | 4.06 | b) | 0.246 | c) | 2.06 | d) | 0.06 |
| 419. | For which order half-life period is independent of initial concentration? | | | | | | | |
|  | a) | Zero | b) | First | c) | Second | d) | Third |
| 420. | For a given reaction, pressure of catalyst reduces the energy of activation by The rate of reaction will be increased by: | | | | | | | |
|  | a) | 20 times | b) | 14 times | c) | 28 times | d) | 2 times |
| 421. | <img src="421\_Q.gif" > | | | | | | | |
|  | a) |  | | | | | | |
|  | b) |  | | | | | | |
|  | c) |  | | | | | | |
|  | d) |  | | | | | | |
| 422. | A first order reaction is 20% complete in 10 min. Calculate the time for 75% completion of the reaction | | | | | | | |
|  | a) | 0.233 min | b) | 62.18 min | c) | 112.12 min | d) | 36.18 min |
| 423. | Order of radioactive disintegration reaction is | | | | | | | |
|  | a) | Zero | b) | First | c) | Second | d) | Third |
| 424. | <img src="424\_Q.gif" > | | | | | | | |
|  | a) | minute | b) | minute | c) | minute | d) | minute |
| 425. | For a reaction for which the activation energies of forward and reverse reactions are equal? | | | | | | | |
|  | a) |  | b) |  | c) | The order is zero | d) | There is no catalyst |
| 426. | The half-life period of a first order chemical reaction is 6.93 min. the time required for the completion of 99% of the chemical reaction will be (log 2=0.302) | | | | | | | |
|  | a) | 230.3 min | b) | 23.03 min | c) | 46.06 min | d) | 460.6 min |
| 427. | The rate of the elementary reaction, when the volume of the reaction vessel is doubled: | | | | | | | |
|  | a) | Will grow eight times of its initial rate | | | | | | |
|  | b) | Reduce to one-eight of its initial rate | | | | | | |
|  | c) | Will grow four times of its initial rate | | | | | | |
|  | d) | Reduce to one-fourth of its initial rate | | | | | | |
| 428. | For the reaction system  if the volume of the reaction vessel is reduced to one-third of its original volume, what will be the order of the reaction? | | | | | | | |
|  | a) | Diminished to one fourth of its initial value | | | b) | Diminished to one twenty seven of its initial value | | |
|  | c) | Increase to twenty seven times of its initial value | | | d) | Increase to four times of its initial value | | |
| 429. | The rate constant of a second order reaction is The rate constant expressed in is: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 430. | Radioactive decay is a | | | | | | | |
|  | a) | First order reaction | | | b) | Zero order reaction | | |
|  | c) | Second order reaction | | | d) | Third order reaction | | |
| 431. | <img src="431\_Q.gif" > | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 432. | The rate of a gaseous reaction is equal to The volume of the reaction vessel containing these gases is reduced by one-fourth of the initial volume. The rate of the reaction would be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 433. | The rate law of the reaction,<br /><br />Product is given by If is taken in large excess, the order of the reaction will be: | | | | | | | |
|  | a) | Zero | b) | 1 | c) | 2 | d) | 3 |
| 434. | A first order reaction has a rate constant. How long will 5g of this reactant take to reduce to 3 g? | | | | | | | |
|  | a) | 444 s | b) | 402 s | c) | 442 s | d) | None of these |
| 435. | For a certain reaction a plot of against time yields a straight line. and are concentrations of reactant at and respectively. The rate of reaction is: | | | | | | | |
|  | a) | 3 | b) | 0 | c) | 1 | d) | 2 |
| 436. | The rate constant is doubled when temperature increases from to . Activation energy in kJ is | | | | | | | |
|  | a) | 34 | b) | 54 | c) | 100 | d) | 53 |
| 437. | If the concentration of reactants is increased by then rate constant becomes | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |

**ACTIVE SITE TUTORIALS**

**Date :**23-07-2019 **TEST ID: 165**

**Time :** 07:17:00 **CHEMISTRY**

**Marks :** 1748

4.CHEMICAL KINETICS

|  |
| --- |
| **: ANSWER KEY :** |

|  |
| --- |
| **1) b 2) d 3) b 4) b**  **5) b 6) a 7) b 8) d**  **9) c 10) c 11) c 12) b**  **13) a 14) c 15) a 16) b**  **17) c 18) d 19) c 20) d**  **21) b 22) b 23) d 24) a**  **25) b 26) c 27) b 28) a**  **29) a 30) b 31) a 32) c**  **33) d 34) d 35) c 36) d**  **37) c 38) a 39) a 40) d**  **41) c 42) a 43) d 44) b**  **45) c 46) c 47) a 48) d**  **49) d 50) c 51) d 52) d**  **53) d 54) c 55) d 56) a**  **57) d 58) a 59) d 60) a**  **61) d 62) b 63) c 64) b**  **65) b 66) d 67) c 68) c**  **69) d 70) c 71) c 72) c**  **73) d 74) c 75) a 76) c**  **77) b 78) d 79) b 80) c**  **81) a 82) a 83) b 84) b**  **85) b 86) c 87) d 88) a**  **89) a 90) d 91) b 92) b**  **93) a 94) b 95) a 96) b**  **97) c 98) a 99) c 100) b**  **101) c 102) a 103) b 104) d**  **105) c 106) c 107) c 108) d**  **109) d 110) c 111) a 112) b**  **113) d 114) c 115) d 116) b**  **117) d 118) a 119) d 120) b**  **121) a 122) b 123) b 124) c**  **125) b 126) a 127) c 128) d**  **129) a 130) d 131) b 132) d**  **133) b 134) a 135) c 136) d**  **137) d 138) d 139) c 140) a**  **141) c 142) c 143) c 144) c**  **145) a 146) a 147) b 148) b**  **149) c 150) d 151) a 152) d**  **153) b 154) a 155) b 156) c**  **157) d 158) d 159) c 160) b**  **161) a 162) a 163) c 164) a**  **165) c 166) b 167) c 168) c**  **169) b 170) d 171) d 172) d**  **173) b 174) b 175) a 176) a**  **177) d 178) a 179) d 180) a**  **181) a 182) c 183) c 184) a**  **185) a 186) b 187) d 188) d**  **189) b 190) a 191) c 192) c**  **193) c 194) c 195) a 196) d**  **197) d 198) a 199) d 200) b**  **201) a 202) d 203) b 204) b**  **205) d 206) c 207) b 208) c**  **209) a 210) a 211) b 212) a**  **213) b 214) b 215) b 216) d**  **217) b 218) b 219) d 220) d**  **221) c 222) b 223) a 224) a**  **225) a 226) d 227) d 228) c**  **229) d 230) b 231) b 232) c**  **233) d 234) d 235) b 236) a**  **237) d 238) a 239) d 240) c**  **241) d 242) b 243) d 244) c**  **245) a 246) c 247) d 248) c**  **249) c 250) b 251) a 252) a**  **253) a 254) b 255) b 256) c**  **257) c 258) a 259) b 260) b**  **261) d 262) b 263) b 264) d**  **265) d 266) d 267) b 268) a**  **269) c 270) c 271) c 272) c**  **273) c 274) a 275) b 276) b**  **277) d 278) d 279) c 280) c**  **281) a 282) a 283) a 284) d**  **285) b 286) d 287) b 288) a**  **289) b 290) b 291) d 292) c**  **293) d 294) c 295) d 296) c**  **297) c 298) c 299) a 300) c**  **301) a 302) d 303) d 304) c**  **305) b 306) c 307) b 308) b**  **309) b 310) b 311) a 312) d**  **313) c 314) c 315) b 316) a**  **317) b 318) c 319) c 320) d**  **321) a 322) c 323) a 324) c**  **325) b 326) d 327) a 328) c**  **329) d 330) a 331) b 332) a**  **333) b 334) c 335) a 336) b**  **337) d 338) a 339) b 340) c**  **341) b 342) d 343) c 344) c**  **345) b 346) a 347) d 348) b**  **349) a 350) b 351) d 352) a**  **353) c 354) b 355) a 356) b**  **357) a 358) c 359) c 360) c**  **361) c 362) b 363) b 364) a**  **365) c 366) a 367) a 368) b**  **369) d 370) b 371) b 372) a**  **373) a 374) b 375) a 376) c**  **377) c 378) c 379) b 380) a**  **381) b 382) a 383) b 384) b**  **385) c 386) d 387) a 388) c**  **389) b 390) b 391) a 392) b**  **393) b 394) a 395) a 396) a**  **397) b 398) d 399) a 400) b**  **401) d 402) d 403) d 404) c**  **405) c 406) a 407) b 408) b**  **409) b 410) a 411) a 412) a**  **413) b 414) d 415) a 416) d**  **417) b 418) a 419) b 420) c**  **421) d 422) b 423) b 424) a**  **425) a 426) c 427) b 428) c**  **429) a 430) a 431) d 432) b**  **433) b 434) a 435) d 436) b**  **437) d** |

**ACTIVE SITE TUTORIALS**

**Date :**23-07-2019 **TEST ID: 165**

**Time :** 07:17:00 **CHEMISTRY**

**Marks :** 1748

4.CHEMICAL KINETICS

|  |
| --- |
| **: HINTS AND SOLUTIONS :** |

|  |  |
| --- | --- |
| 1 | **(b)**  For first reaction,  For second reaction,  Given, |
| 2 | **(d)**  These are the characteristics of effective collisions. |
| 3 | **(b)**  Pseudo first order rate constant is doubled as well as rate of reaction is doubled. It may be noted that in presence of acid, hydrolysis of ethyl acetate is a pseudo-unimolecular reaction but the actual value of k depends upon the concentration reaction but the actual value of k depends upon the concentration of ions, otherwise rate constant of a reaction is constant at constant temperature. |
| 4 | **(b)**  We know that,  Where, n=order of reaction  Given,  On substituting the values  On taking log both sides  0.90=(n-1)0.90  n-1=1  n=2 |
| 6 | **(a)**  For order reaction  For Ist order reaction  Unit of  For zero order reaction  Unit of |
| 7 | **(b)**  For II order reaction, |
| 8 | **(d)**  If vs times are a straight line then order of reaction is third. |
| 9 | **(c)**  For an endothermic reaction where represents the enthalpy of the reaction, the minimum value for the energy of activation is more than |
| 11 | **(c)**  So  Therefore, the formula of for a zero order reaction is |
| 12 | **(b)**  The curve shows a gradual increase in the concentration with time. |
| 13 | **(a)**  Acid hydrolysis of sucrose is a pseudo unimolecular or pseudo first order reaction. Hydrolysis of sucrose in presence of mineral acid is a biomolecular reaction. But as water is taken in large excess, so the rate of reaction only depends upon concentration of sucrose. Hence, order of the reaction is one.  Therefore, it is called a pseudo first order reaction. |
| 14 | **(c)**  For first order reaction |
| 15 | **(a)** |
| 16 | **(b)**  For the first order reaction,  Given,  Substituting these values in (i) |
| 17 | **(c)**  The definition of activation energy. |
| 18 | **(d)** |
| 19 | **(c)**  Thus, |
| 20 | **(d)** |
| 21 | **(b)**  For parallel path reaction  Also fractional yield of  Fractional yield of |
| 23 | **(d)**  For first order : |
| 24 | **(a)**  Ionic reactions are instantaneous one. |
| 25 | **(b)**  For zero order reaction, rate of reaction is independent of concentration i.e., rate of reaction does not depend upon the concentration of reactant. |
| 26 | **(c)** |
| 27 | **(b)**  The rate law for the reaction is as  r==k(A)=  on increasing the concentration of A,B and C two times.  r’==k(2A)  =8k(A)  Thus, the rate increases eight times. |
| 28 | **(a)**  Activation energy is the needed by reactant molecules to gain threshold energy level. |
| 29 | **(a)**  The rate of zero order reaction is independent of the concentration of the reactants or the concentration of the reactant do not change with time. Thus, the rate of reaction remains constant.  Or Rate=k |
| 30 | **(b)**  For first order reaction,  Where, a= initial concentration  X= change in concentration during time‘t’.  If 75% of the reaction was completed in 32 min, then  Hence, time required for the completion of 50% reaction. |
| 31 | **(a)**  For the reaction : |
| 32 | **(c)**  Rate of reaction, |
| 33 | **(d)**  For third order reaction, |
| 34 | **(d)**  Since, in this reaction, water is excess, it is an example of psedo first order reaction (as rate depends only on the concentration of ). |
| 36 | **(d)**  The efficiency of an enzyme in catalyzing a reaction is due to its capacity to lower the activation energy of the reaction |
| 37 | **(c)**  The rate of reaction is: |
| 38 | **(a)**  For exothermic reaction, activation energy of reverse reaction is greater than activation energy of forward reaction, |
| 39 | **(a)** |
| 40 | **(d)**  is Arrhenius equation. Thus plots of will give slope. |
| 41 | **(c)** |
| 42 | **(a)**  does not change with time; also unit of suggest it to be II order. |
| 43 | **(d)**  Follow review of rate of reaction. |
| 44 | **(b)**  Molecularity represents the number of molecules of reactants taking part in an elementary step of reaction. |
| 45 | **(c)**  or  Thus, slope or  and for I order reaction . |
| 46 | **(c)** |
| 47 | **(a)**  A reaction. |
| 48 | **(d)**  Rate becomes times if concentration is made x time of a reactant giving order reaction.  Rate =k  Concentration of A is doubled hence x=2 ,y=n and rate becomes times  Concentration of B is halved ,hence x= and y=m and rate becomes= times  Net rate becomes=times  =times |
| 49 | **(d)**  For the reaction  Rate of reaction  Molecularity of reaction  Order of reaction |
| 50 | **(c)**  When heat energy is supplied, kinetic energy of reactant molecules increase. This will increase the number of collisions and ultimately rate of reaction will be enhanced. |
| 51 | **(d)** |
| 52 | **(d)**  I step of mechanism shows I order in both reactants. |
| 53 | **(d)**  and  Also,  Now notice that all the given facts are satisfied. |
| 54 | **(c)**  Half-life depends upon rate constant and rate constant varies with temperature as increase with temperature. Also |
| 55 | **(d)**  …(i)  But is in equilibrium  …(ii)  Putting the  Hence,  where, k’.Keq  the order, of reaction with respect to NO(g) is 2 |
| 56 | **(a)**  For zero order reaction, for example, |
| 57 | **(d)**  The increase in collision frequency brings in an increase in effective collisions and thus, rate of reaction increases. |
| 58 | **(a)**  When  Hence, order of reaction |
| 59 | **(d)**  There are two different reactants (say A and B).  Thus,it is a bimolecular reaction .  If  It is second order reaction  If (  Or =k[B]  It is first order reaction .  Molecularityis independent of rate ,but is the sum of the reacting substance thus it cannot be unimolecular reaction . |
| 60 | **(a)**  - |
| 61 | **(d)**  If  Hence, becomes independent of |
| 62 | **(b)**  Larger is surface area, more is rate of reaction. |
| 63 | **(c)**  Reactions having lower energy of activation occurs more fast under similar experimental conditions. |
| 64 | **(b)**  For the first order reaction  [A]→concentration of reactant  K→rate constant  Given that,  K=? and [A]=0.5 M  =  For first order reaction,  Half-life period  =23.1min |
| 65 | **(b)**  Temperature coefficient, |
| 66 | **(d)**  The minimum energy required by reaction molecules to undergo reaction is called activation energy. |
| 67 | **(c)**  For an th order reaction  For 1st order reaction , |
| 68 | **(c)**  For every rise of temperature, rate is doubled. Thus, temperature coefficient of the reaction=2  When temperature is increased by , rate becomes  = times=32 times |
| 69 | **(d)**  Order may or may not be equal to molecularity. |
| 70 | **(c)** |
| 71 | **(c)**  The reaction occurring in two steps has two activation energy peaks. The first step, being fast needs less activation energy. The second step being slow, needs more activation energy. Therefore, second peak will be higher than the first |
| 73 | **(d)** |
| 74 | **(c)**  If |
| 75 | **(a)** |
| 76 | **(c)**  Hence, the order of reaction is second.  For second order reaction, |
| 77 | **(b)** |
| 78 | **(d)**  The reaction is said to be of second order if its reaction rate is determined by the variation of two concentration terms of reactants.  Is an example of second order reaction. |
| 79 | **(b)**  Temperature coefficient is the ratio of two velocity constant having the difference of For most of the reaction the value of temperature coefficient lies between 2 and 3 |
| 81 | **(a)**  Where stands for product concentration and stands for reactant concentration. It continuously decreases with decrease in concentration of reactant with time. |
| 82 | **(a)**  For zero order reaction, |
| 83 | **(b)**  Effect of temperature on reaction rate is given by Arrhenius equation |
| 84 | **(b)**  This is Arrhenius equation. |
| 85 | **(b)**  Let ,initial concentration=a  Final concentration=a- a=  =2.01 |
| 86 | **(c)**  Let the order with respect to A and B is x and y respectively.  Hence,  …(i)  On doubling the concentration of A, rate increases 4 times,  …(ii)  From Eqs. (i) and (ii)  X=2  order with respect to A is 2  If concentration of A and B both are doubled,  …(iii)  From Eqs. (i) and (iii), we get  Y=1  Hence , differential rate equation is  or  [Where, and =concentrations of A and B] |
| 87 | **(d)**  …(i)  When concentration is doubled then  …(ii)  Divide Eq. (ii) by (i) |
| 88 | **(a)** |
| 89 | **(a)**  From the unit of rate constant ( it is clear that the reaction is of first order.  Hence, for first order reaction ,  Or =0.00880  =1.02 |
| 91 | **(b)** |
| 92 | **(b)**  Rate of decomposition of  Rate of formation of |
| 93 | **(a)**  Given, reaction is75% completed is 32 min  A=100,x=75  …(1)  For 50% completion of reaction  A=100, x=50  …(2)  Or or |
| 94 | **(b)**  Rate  Thus, the order of reaction w.r.t. A=1  The order of reaction w.r.t.B=1  Total order of reaction=1+1=2 |
| 95 | **(a)**  The intersection point indicates that half of the reactant is converted into . |
| 96 | **(b)**  At |
| 97 | **(c)**  Zero order reactions occur with constant rate. |
| 98 | **(a)** |
| 99 | **(c)**  For the reaction  On increasing the concentration of reactant (i.e.,A) by 4 times , the rate of reaction becomes double ,hence order of reaction is |
| 100 | **(b)**  The rate of chemical reaction always decreases with time as reaction proceeds due to decrease in number of reactant molecules. Only for zero order reactions the rate of chemical reaction remains same. |
| 101 | **(c)**  For a zero order reaction,  product  Rate=  Integrating the above equation.  …(i)  Where, I is integration constant  At  Put this value in Eq. (i)  or |
| 102 | **(a)**  For first order reaction,  Half-life period  Where, k=rate constant  =0.01 |
| 103 | **(b)**  For order reaction :  For second order reaction |
| 104 | **(d)**  By (1) and (2)  By (2) and (3)  By (3) and (4) |
| 105 | **(c)**  Unit of rate constant  Where, n=order of reaction  Given, unit of rate constant =  Or 1=n-1  Or n=2  order of reaction =2 |
| 106 | **(c)**  Activation energy of a chemical reaction can be determined by evaluating rate constants at two different temperatures |
| 107 | **(c)**  can never be fractional. |
| 109 | **(d)**  For this reaction, rate  On doubling the volume of vessel, concentration would be half. Hence,  Rate |
| 110 | **(c)**  If , then rate= |
| 111 | **(a)**  As is slowest hence is the rate determining step of the reaction |
| 112 | **(b)** |
| 113 | **(d)**  Heat of reaction  For  kJ |
| 114 | **(c)**  For endothermic reaction  Activation energy  Energy of reaction  Hence, activation energy for the reaction is |
| 115 | **(d)**  For zero order |
| 116 | **(b)**  Where, =rate constant=  =initial amount=100  =amount left after time t=25  =time to leave 25% reaction |
| 117 | **(d)**  By increasing 10 K temperature the rate of reaction becomes double. When temperature is increased from 303 K to 353 K, the rate increases in steps of and has been made 5 times. Hence, the rate of reaction should increases times., 32 times. |
| 118 | **(a)**  Temperature coefficient  Thus, increase in rate is two times, when temperature is increased. Hence, by the increase of (100-30=70), the increase in rate will be  times |
| 119 | **(d)**  increase by 28.8% |
| 120 | **(b)**  Remember for  = Rate of reaction  For the given reaction  =rate of reaction  Rate of disappearance of A |
| 121 | **(a)**  ∴ |
| 123 | **(b)**  For zero order reaction  Now, concentration  Hence, initial concentration |
| 124 | **(c)**  For the reaction, |
| 125 | **(b)**  The reaction is a first order reaction.  Hence ,  Or  =33min |
| 126 | **(a)**  To be solved with the help of formula, |
| 127 | **(c)**  is differential form of II order.  Integrate it to get . |
| 128 | **(d)**  In this case,  Overall order of reaction  Hence, code 3 is wrong |
| 129 | **(a)**  For the first order reaction,  Or |
| 130 | **(d)**  Order of reaction is an experimentally determined quantity and thus,cannot be predicted from the given equation. |
| 131 | **(b)**  The rate for first order reaction is expressed as  Rate=  Rate=k[A]  And the rate constant (k) is given as |
| 132 | **(d)**  Where, n=order of reaction  a= initial concentration  For first order reaction,  n=1  Thus for a first order reaction, is independent of initial concentration. |
| 133 | **(b)**  Relation between and initial concentration of reactant for order reaction |
| 134 | **(a)** |
| 135 | **(c)**  Rate of endothermic reactions increase with increase in temperature while that of exothermic reactions decrease with increasing temperature. |
| 136 | **(d)**  For half-life period, |
| 137 | **(d)**  Rate constant rate constant  Greater the rate constant lesser will be the activation energy |
| 138 | **(d)**  The reactant concentration drop from to takes place in 15 minute. |
| 139 | **(c)** |
| 140 | **(a)**  The Arrhenius equation can be written as  On comparing this equation with standard equation of straight line  we get,  Hence, on plotting graph between (-axis), we get a line with slope equal to |
| 141 | **(c)** |
| 142 | **(c)**  As we know that, rate of reaction is directly proportional to concentration of reactant and inversely proportional to the volume of vessel.  concentration  For a given reaction,  Rate of reaction=  If volume of vessel is reduced by of its initial value, then concentration of compound is increase by 3 times. Hence, the rate of reaction will be increased by 27 times. |
| 143 | **(c)**  For a zero order reaction  Since,  So, and |
| 144 | **(c)**  Rate (𝑟)=𝑘 …(i)  2𝑟=𝑘  3𝑟=𝑘 …(iii)  Dividing eq.(ii) by eq.(i)  or a=1  Dividing eq (iii)by eq.(i)  So order of reaction |
| 145 | **(a)** |
| 146 | **(a)** |
| 147 | **(b)**  Thermal decomposition, |
| 148 | **(b)**  For the reaction :  After 10 min  After long time  Total pressure  Total pressure after long time  Calculate the value of from above two equation and then the difference of will be the pressure of |
| 149 | **(c)**  Where,  activation energy of forward reaction  =activation energy of backward reaction  The above energy profile diagram shows that  The potential energy of the product is greater than that of the reactant, so the reaction is endothermic.  or |
| 150 | **(d)**  Combination of and to give HBr is zero order reaction as the rate of reaction is not affected by the concentration of reactants.  2HBr |
| 151 | **(a)** |
| 152 | **(d)**  order of the reaction is=2/3 |
| 153 | **(b)**  For zero order reaction  When 80% completion take place |
| 154 | **(a)**  [B] is doubled, half-life didn’t change  Half-life is independent of change in concentration of reactant i.e., first order  First order w.r.t. to B  When [A] is doubled, rate increased by two times  First order w.r.t.A  Hence, net order of reaction =1+1=2  Unit for the rate constant= |
| 156 | **(c)**  Given  For a reaction |
| 157 | **(d)**  According to Arrhenius equation, the relationship between the activation energy and temperature is  Activation energy decreases with rise in temperature, thereby increasing the rate of the reaction. |
| 158 | **(d)** |
| 159 | **(c)**  For a zero order reaction, the plot of concentration of reactant vs time is astraight line (linear) with a negative slope and non-zero intercept. |
| 160 | **(b)** |
| 161 | **(a)**  The ratio of rate constant when temperature is raised, is called temperature coefficient. For most of the reaction, it has a value of 2.  Hence, for the given reaction,  Rate constant at 290 K=  Rate constant at 300 K= |
| 162 | **(a)**  represent the change in concentration of reactant with time. As, in a reaction, concentration of reactant always decrease with time hence, rate of reaction is represented as |
| 163 | **(c)**  = |
| 164 | **(a)**  For,  Rate of reaction  Where, is rate consumption of ( sign)  is rate of consumption of ( sign)  is rate of formation of (+ sign)  Individual rates become equal when each of these is divided by their respective stoichiometric coefficient. |
| 165 | **(c)**  Given,  According to equation |
| 167 | **(c)**  For the reaction,  A+B →C  where, k=rate constant |
| 168 | **(c)**  For second order reaction, (rate)  Of reaction increases four times when concentration of reaction is increased two times.  It is second order reaction. |
| 169 | **(b)** |
| 170 | **(d)**  According to collision theory,  1. The reaction rate depends on collision frequency and effective collisions. For a molecule to have effective collision it should fulfill two conditions; proper orientation and sufficient energy.  2. The collision rate ., the number of collisions taking place in unit volume is also termed as collision frequency () and is given by  3. Greater the temperature, greater will be the collision rate. |
| 171 | **(d)**  .  The activation energy for the forward reaction = 50 kcal  The activation energy for the backward reaction=50+22=72 kcal. |
| 172 | **(d)**  Only those collisions are effective collisions which are energetic enough and cross over the threshold energy level. |
| 173 | **(b)** |
| 174 | **(b)**  It is a characteristic of zero order reaction. |
| 175 | **(a)**  Follow review of order of reaction. |
| 176 | **(a)**  Average life is defined as, “reciprocal of decay constant.” If decay constant for a reaction is then,  Average life= |
| 177 | **(d)**  [variation in the concentration time plot for a zero order reaction] |
| 178 | **(a)**  Energy of activation does not depend on the stoichiometry of change. It is characteristic value for a chemical reaction. |
| 179 | **(d)** |
| 180 | **(a)**  Slow reaction rate indicates higher free energy of activation |
| 181 | **(a)**  It is the definition of . |
| 182 | **(c)**  ] |
| 183 | **(c)**  No doubt order cannot be predicted by merely looking chemical reaction but this can be treated as standard example of II order reaction. |
| 184 | **(a)** |
| 185 | **(a)**  For zero order reaction  Rate =  K= |
| 186 | **(b)**  By Arrhenius equation,  and  (is Arrhenius constant) (Since, ) |
| 187 | **(d)**  For the reaction,  According to rate laws,  Rate concentration of reactants  Where, k=rate constant |
| 188 | **(d)**  This is activation state and orientation concept for mechanism of reactions. |
| 189 | **(b)**  Rate depends upon the slowest step. Hence, from equation  And from equation |
| 190 | **(a)**  Amount of left in halves  Amount of left in halves  Also if when decays to halves and decays to halves.  Now, and  By Eqs. (i) and (ii)  Thus, |
| 191 | **(c)**  On doubling the concentration of A, the rate of reaction becomes two times.  The order of reaction w.r.t. A is 1  On doubling the concentration of B, the rate of reaction does not change.  the order of reaction respect to B is 0  on doubling the concentration of C, the rate of reaction becomes four times  the order of reaction w.r.t. C is 2  the overall order of reaction=1+0+2=3 |
| 192 | **(c)**  For order; unit of rate constant may be derived by |
| 193 | **(c)** |
| 194 | **(c)**  Initially a 0  After time t (a-x) x  After  For the first order kinetics , |
| 195 | **(a)**  The order of reaction is zero.Suppose the following reaction take place .  order =1+(-1)=0 |
| 196 | **(d)**  Pseudo first order reactions are those reactions which are not truly first order but show first order kinetics under specific conditions. For examples, acidic hydrolysis of an ester and hydrolysis of cane sugar. |
| 197 | **(d)**  The differential rate law for the reaction,  is |
| 198 | **(a)**  After 260 hr, |
| 199 | **(d)**  Rate =  Hence ,rate determining step is |
| 200 | **(b)**  For this reaction rate of reaction is depends upon the concentration of  It means, the rate of reaction is halved by reducing the concentration of by one half |
| 201 | **(a)** |
| 202 | **(d)**  Molecularity of reaction is simply the number of molecules reacting in balanced chemical equation.It can be simply determined by examining balanced equation. |
| 203 | **(b)**  Time required to complete a definite fraction is independent of initial concentration. |
| 204 | **(b)**  For this reaction  For this reaction,  For this reaction, |
| 205 | **(d)**  The collision frequency increase on increase of temperature. With the increase in temperature, the average kinetic energy of the molecules increases and this leads to an increase in number of collisions per unit time. The rate constant of a reaction is also increases with increase of temperature. |
| 206 | **(c)**  For first order reaction ,  k= |
| 207 | **(b)**  In the given graph,  where, activation energy of reverse reaction |
| 209 | **(a)**  a=0.1M  For first order reaction,  t=30 min |
| 210 | **(a)**  The slowest step is the rate determining step. Formation of B(i.e., step I) is the slowest step, therefore step I is the rate determining step. |
| 211 | **(b)**  For a reaction for forward reaction for backward reaction  . |
| 212 | **(a)** |
| 213 | **(b)**  takes 30 min in each step, is independent of hence, it is a first order reaction |
| 214 | **(b)** |
| 215 | **(b)**  Also, |
| 216 | **(d)** |
| 217 | **(b)**  Dividing,  Hence, order of reaction |
| 218 | **(b)**  Rate of formation of |
| 219 | **(d)**  (forward)= 180 kJ  (backward)= 200 kJ  In the presence of catalyst  (forward)=180-100=80 kJ  (backward)=200-100=100 kJ |
| 220 | **(d)**  Increase in pressure or concentration brings in an increase in collision frequency as well as increase in effective collision. Recall that energy of activation is not at all related with exothermic or endothermic nature. |
| 221 | **(c)**  temperature coefficient is the ratio of rate constant at two temperatures differing by preferably at and . |
| 222 | **(b)**  Negative sign indicates for the decrease in concentration with time. |
| 223 | **(a)**  For first order reaction |
| 224 | **(a)**  where is order of reaction when |
| 225 | **(a)** |
| 226 | **(d)**  Arrhenius equation gives relation of rate constant with temperature.  On taking logarithm, we get  or |
| 227 | **(d)**  Or  We know that  So, |
| 228 | **(c)**  Increase in the concentration of the reactants leads to the change in collision frequency because greater the concentration, greater is the collision frequency |
| 229 | **(d)**  Arrhenius equation is: |
| 230 | **(b)**  Given,  On taking log both sides, |
| 231 | **(b)**  The change in molarity  rate of reaction change in molarity per sec |
| 233 | **(d)**  The rate of reaction varies with time as well as with concentration and pressure. |
| 234 | **(d)**  For a first order reaction,  rate |
| 235 | **(b)**  For first order reaction,  Constant values of k calculated for different times, shows first order reaction. |
| 236 | **(a)**  For I order reaction : |
| 237 | **(d)**  Comparing the slope and intercept of the given equation with the following Arrhenius equation :  Hence,  Comparing slope gives 38.3 kJ/mol |
| 238 | **(a)**  The factor is Boltzmann factor and is frequency factor. |
| 239 | **(d)**  Ionic reactions are instantaneous. |
| 240 | **(c)**  Rate =  Hence, order of reaction is 2  Rate =  Hence, order of reaction is (1+1)=2  Therefore these reactions are most likely to be elementary reaction that occurs in one step. |
| 241 | **(d)**  Suppose order of reaction =n  When concentration of both G and H doubled then rate increases by eight times.  n=3  When concentration of G is doubled keeping the concentration of H fixed, the rate is doubled.  then, |
| 242 | **(b)**  For a zero order reaction  Or  Or |
| 243 | **(d)**  (b)  Or  Or |
| 245 | **(a)**  Rate constant  Or  = 600 s |
| 246 | **(c)**  For the reaction  Rate of reaction at a given instant can be represented by |
| 247 | **(d)**  VSEPR theory is for bonding concept. |
| 248 | **(c)** |
| 249 | **(c)**  Rate law  Hence, order of reaction |
| 250 | **(b)**  A graph between the log concentration (log c) of reactant and time t for the first order reaction gives a straight line, whose slope is equal to  Hence, the order of the above reaction is one. |
| 251 | **(a)**  It is a third order reaction. As the concentration of both affect the rate of reaction  Hence, order of reaction |
| 252 | **(a)**  The order of this reaction over water is zero and in general case it is two. This is an experimental fact. |
| 253 | **(a)**  . |
| 254 | **(b)** |
| 255 | **(b)** |
| 256 | **(c)**  Rate constant is characteristic constant of a reaction and depends only on temperature and catalyst. |
| 257 | **(c)**  Unit of depends on unit of . |
| 258 | **(a)**  Oppositely charged ions are attracted instantaneously to show reaction. |
| 259 | **(b)**  for first order reaction, |
| 260 | **(b)** |
| 261 | **(d)**  We know that if temperature is increased then velocity increases 2 times.  Because temperature increases hence, rate of reaction will increase times or 1024 times. |
| 262 | **(b)** |
| 263 | **(b)**  We know,  Where, and are the half-life periods when the initial concentration are and  According to question  On substitution the values  On taking log on both sides |
| 264 | **(d)**  A  Units of  B  Units of |
| 265 | **(d)**  Choice (c) is an exceptional case. The rate of reaction always increases with increase in temperature. |
| 266 | **(d)**  Slowest step is rate determining step, thus,in case (A), rate law is given as  While for the reaction given in case (B), rate law is given as rate  Hence, only mechanism (A) is consistent with give rate law. |
| 267 | **(b)**  Rate of reaction  . |
| 268 | **(a)**  For 2/3 of a reaction |
| 269 | **(c)**  First calculate number of half-lives with  Then calculate |
| 270 | **(c)**  Given ,=initial concentration =1  N=concentration after time  K=  Or  T=  =3  =300s  ∴ after 300s it will be reduced to of original concentration. |
| 271 | **(c)**  Order of reaction is sum of powers raised on concentration terms in order to write rate expression. |
| 272 | **(c)**  In Haber’s process, ammonia is synthesized as  +3  Rate of synthesis of ammonia=  =1 mol/min  Rate of disappearance of nitrogen, i.e.,  = |
| 273 | **(c)**  For second order reaction, |
| 274 | **(a)**  For I order :  For zero order : |
| 275 | **(b)**  On increasing the temperature the kinetic energy of the reacting molecules increases and hence, number of collisions increases. So, the rate of reaction will also be increased. |
| 276 | **(b)**  For I order reaction, |
| 277 | **(d)**  The half-life period of a first order reaction is independent of the initial concentration of the reactant |
| 278 | **(d)**  for each rise in temperature |
| 279 | **(c)**  For zero order reaction,  Where, [A]0= initial concentration=a  [A]=remaining concentration  On putting value of and [A],we get |
| 280 | **(c)**  Bimolecular but of first order. |
| 281 | **(a)**  For first order reaction :  For Ist case :  For the IInd case : |
| 282 | **(a)**  Order of reaction may be fractional. |
| 283 | **(a)**  Difference in threshold energy barrier gives different values of energy of activation.  Also and |
| 284 | **(d)**  Order of reaction is sum of powers raised on concentration terms in order to write rate expression. |
| 285 | **(b)**  Let,  Therefore and |
| 286 | **(d)**  The higher threshold energy barrier prevents coal to burn spontaneously and provides kinetic stability to fuel. |
| 287 | **(b)** |
| 289 | **(b)**  Rate of disappearance of |
| 290 | **(b)** |
| 291 | **(d)**  For the given reaction, |
| 292 | **(c)**  The order of reaction with respect to a reacting compound, is zero. It means rate of reaction is independent of its concentration. |
| 293 | **(d)**  Rate of formation of rate of disappearance of |
| 294 | **(c)**  N=3  ==42s |
| 295 | **(d)**  If then |
| 296 | **(c)**  For first order reaction, rate=k[concentration]  per second, concentration=0.1M  Rate= |
| 297 | **(c)** |
| 298 | **(c)**  Rate  Now, |
| 299 | **(a)**  Eqs.  . |
| 300 | **(c)** |
| 301 | **(a)**  In the presence of acid, hydrolysis of ethyl acetate is a pseudo-unimolecular reaction but the actual value of depends upon the concentration of ion. As is stronger acid than and moreover ions produced from is double than therefore, |
| 304 | **(c)** |
| 305 | **(b)**  For first order reaction . |
| 306 | **(c)**  milli second |
| 308 | **(b)**  For exothermic reaction However, rest all are true.  We have  Thus,  If, then  If, then |
| 309 | **(b)**  Rate constant is characteristic of a reaction. |
| 310 | **(b)**  For a first order reaction, Arrhenius equation is given as  where, energy of activation  Taking log on both the sides, we get |
| 311 | **(a)**  atoms  g of Na will haveatoms  Therefore, |
| 312 | **(d)**  Rate of reaction when concentration of X is 0.01 M will be |
| 313 | **(c)**  For a zero order reaction  product  Integrating the above equation  …(i)  At  Or |
| 314 | **(c)**  Rate=k[A][B]  It represents second order reaction.  Thus , unit of k is  (a) is false  is dependent of concentration but not constant  (b) is false  thus (C)is correct |
| 315 | **(b)**  For order reaction the unit of k is expressed as  Hence ,for second order ,the unit of rate constant is as |
| 316 | **(a)** |
| 317 | **(b)**  The rate constant of reaction depends upon temperature. |
| 318 | **(c)**  If the temperature is increased by then increase has been made 6 times and therefore, rate will increase by |
| 320 | **(d)**  Rate of reaction depends upon nature of reactants, concentration of the reactants, temperature and presence of catalyst. |
| 321 | **(a)**  No doubt an increase in temperature may increase no. of collisions also but this is the increase in number of effective collisions (with more energy) which decide the rate. |
| 322 | **(c)**  From slow step, rate  From 1st equation  Hence, rate  Hence, order |
| 323 | **(a)**  According to formula  Lowering of (activation energy), raises the value of. |
| 324 | **(c)**  rate constant  pre-exponential, frequency factor  activation energy  gas constant  temperature |
| 325 | **(b)**  Slowest step of mechanism decides the rate expression,  Thus, rate |
| 326 | **(d)**  Net rate of reaction rate of forward reaction rate of backward reaction  Also at equilibrium. |
| 327 | **(a)**  When volume is reduced to one fourth, concentration become four times. Hence, the rate of reaction becomes 16 times as compared to the initial rate. |
| 328 | **(c)**  We know that, |
| 329 | **(d)**  Number of collisions of one molecules/unit time=  Number of collision of molecules/unit time=.  As in one collision, two molecules are involved, collision frequency=. |
| 330 | **(a)**  K=2.34  Unit of k suggest that the reaction is of 1st order, hence for 1st order reaction, |
| 331 | **(b)**  For zero order reaction integrated rate equation is  If |
| 332 | **(a)**  Arrhenius equation  In  or  Hence, is calculated with the help of slope of following. |
| 333 | **(b)**  will be straight line  Intercept of |
| 334 | **(c)**  K= reaction rate constant  Then unit of second order reaction rate constant |
| 335 | **(a)**  Given,  Let concentration of B is changed by x times.  Then,  As |
| 336 | **(b)**  The intermediates species is one which is formed and used up during the course of reaction. |
| 337 | **(d)**  Integrated rate expression for order is  . |
| 338 | **(a)**  If the order of reaction w.r.t. A is n and the order of reaction w.r.t. B is m, rate law become  Rate =  From (1)  From (2)  From (3)  from eqs.(i) and (ii)  From eqs.(iii) and (iv)  Overall order of the reaction |
| 339 | **(b)**  For II order reaction, ;  . |
| 340 | **(c)** |
| 341 | **(b)**  Arrhenius equation is,  Rate constant,  On solving, we get |
| 342 | **(d)**  is an endothermic reaction =+ ve  energy of activation of backward reaction  energy of activation of forward reaction  heat of reaction  Thus,  Thus, |
| 343 | **(c)** |
| 344 | **(c)**  Three molecules are taking part in elementary step. |
| 345 | **(b)**  The rate expression is derived for slowest step of mechanism. |
| 346 | **(a)**  And |
| 348 | **(b)**  For zero order reaction  For |
| 349 | **(a)**  Given ,  Where [A]=[2A]and B=[2B]  R’=8R  Thus, the rate will become eight times |
| 351 | **(d)**  A decrease in will increase rate constant and thus rate of reaction increases. |
| 352 | **(a)**  The temperature coefficient is the ratio of two velocity constants having the difference of .  Temperature coefficient  For most of the reactions its value lies between 2 and 3. |
| 353 | **(c)** |
| 354 | **(b)** |
| 355 | **(a)**  For I order reaction, |
| 356 | **(b)**  For second order reaction  When concentration of A(reactant)is doubled  Comparing Eqs.(1)and(2)  r’ =4r |
| 357 | **(a)**  With increase in temperature reaction rate increases due to increase in number of molecules having threshold energy. |
| 358 | **(c)**  The value of first order rate constant expends on the units of the concentration term used is not the correct statement. |
| 359 | **(c)**  Since rate constant  Zero order reaction.  For zero order  By Eq. (i), |
| 360 | **(c)**  products  Rate of reaction,  If the concentration of become double then the rate will be |
| 361 | **(c)**  From  Where, order of reaction  For second order |
| 362 | **(b)**  10% of the reaction is completed in 20min .Next 20% of the reaction will be completed in next 20min.Hence, 10%+9%=19% of the reaction will be completed in 20+20=40min. |
| 363 | **(b)**  A graph plotted between for calculating activation energy is shown as:  From Arrhenius equation |
| 364 | **(a)**  And |
| 365 | **(c)**  Hence, |
| 366 | **(a)**  2p 0 0  2p-x x x after 10 min  0 pp after completion  Given,P+P=200  After 10 min,  (given) |
| 367 | **(a)**  Arrhenius equation is written as  Taking logarithm, above equation may be written as  In  Subtracting the Eq. (i) from Eq. (ii) |
| 368 | **(b)**  Excessglucose fructose  when one of the reactant is present in large excess, the second order reaction confirms to the first order and is knows as Pseudo-unimolecular reaction |
| 369 | **(d)**  Rate of reaction |
| 370 | **(b)** |
| 371 | **(b)** |
| 372 | **(a)**  A(first order reaction )  For first order reaction ,  Rate constant (k)=  At t= 40min,  =  At concentration of  Rate |
| 373 | **(a)**  Or |
| 375 | **(a)**  Given that, unit of ‘k’ suggest that the reaction is of Ist order , hence for Ist order reaction,  =0.30 s |
| 376 | **(c)** |
| 377 | **(c)**  Arrheniu equation gives relation between rate constant and temperature of a reaction. It can be written in many forms, as  Where, rate constant  activation energy  absorbption temperature  frequency factor |
| 378 | **(c)**  Order of reaction is sum of the power raised on concentration terms to express rate expression. |
| 379 | **(b)**  is activation energy, it is that energy, which molecule must have to give the product. |
| 381 | **(b)**  For an increase of temperature to  5 times, the rate increases by times,  32 times. |
| 382 | **(a)**  Also the increase in pressure is due to the formation of because one mole of gives one mole of and half mole of .  Thus, |
| 383 | **(b)**  The units of the rate constant for nth order reaction is  for second order reaction,  Unit of rate constant  s |
| 384 | **(b)**  However, order should not be suggested from chemical equation. This question is not correct. |
| 385 | **(c)**  On doubling the concentration of A, rate of reaction increases by 4 times.  (w.r.t. A)  However, on doubling the concentration of B rate of reaction increases two times.  Thus, overall order of reaction =2+1=3 |
| 386 | **(d)**  and  . |
| 387 | **(a)**  Rate of reaction, |
| 388 | **(c)**  completion means 3 half lives. |
| 389 | **(b)** |
| 391 | **(a)**  Luminescence is the emission of light by a substance for any reason other than rise in its temperature.   1. **Chemiluminescence** it is luminescence resulting from a chemical reaction, this is emission of visible light 2. **Phosphorescence** if the luminescence persists significantly after the existing cause is removed, it is called phosphorescence if it does not, and it is called **fluorescence.** 3. **Bioluminescence** It is luminescence produced by living organism., firefly. |
| 392 | **(b)**  Reactions having low are fast reactions and reactions having high are slow reactions.  If the is high, then the number of effective collisions will be small and the reaction will be slow. |
| 393 | **(b)**  For the reaction, |
| 394 | **(a)**  For first order reaction the half-life period is independent of the initial concentration of the reactants. |
| 395 | **(a)**  First order kinetics,  Zero order kinetics,  Hence, |
| 396 | **(a)**  Given,  order of reaction |
| 397 | **(b)** |
| 398 | **(d)**  Nature and concentration of the reactants and temperature of the reaction influence the rate of reaction. But molecularity does not affect the rate of reaction as it includes the number of atoms, ions or molecules that must collide with one another to result into a chemical reaction. |
| 399 | **(a)**  So reaction must be zero order |
| 400 | **(b)**  For zero order,  or line passes through origin. |
| 402 | **(d)**  For an endothermic reaction |
| 403 | **(d)**  For a zero order reaction rate and rate constant are independent of reactant concentration |
| 404 | **(c)**  Rate constant is a characteristic constant for a given reaction. |
| 405 | **(c)**  The rate law for an elementary step can be given by simply observing the rate expression. |
| 406 | **(a)**  Threshold energy level is a characteristic of a reaction which may be however lowered, if catalyst is used. |
| 407 | **(b)** |
| 408 | **(b)**  Rate |
| 409 | **(b)**  Enzyme catalysed reactions decreases energy of activation to greater extent. |
| 410 | **(a)**  , As temperature increases increases exponentially. |
| 411 | **(a)**  For the homogenous gaseous reaction,  Or  Or unit of rate constant ‘k’ is . |
| 412 | **(a)**  For zero order reaction,  If (complete reactant to react); |
| 413 | **(b)**  for two-third of a reaction , |
| 414 | **(d)**  Rate constant almost gets doubled by the increase of in temperature. Hence, the rate constant at 310 K will be  (increase in temperature=20 K) |
| 415 | **(a)**  Unit of  Therefore, the unit of k is   for fourth order reaction. |
| 416 | **(d)**  It is the definition of chemical kinetics. |
| 417 | **(b)** |
| 418 | **(a)**  For reacted,  For reacted,  Since because has reacted when has reacted. |
| 419 | **(b)**  For first order half-life period is independent of initial concentration |
| 420 | **(c)** |
| 421 | **(d)**  for a reversible reaction of I order opposed by I order. |
| 422 | **(b)**  For Ist order reaction  If  If |
| 423 | **(b)**  Order of radioactive disintegration reaction is first. For example  Radium radon a-particle |
| 424 | **(a)**  When then |
| 425 | **(a)**  If energy of activation for forward and backward reactions are same, reaction is neither exothermic not endothermic. |
| 426 | **(c)**  Half-life=6.93 min  We know ,for per cent completion |
| 427 | **(b)**  Concentration of each species are reduced by on increasing volume to two times and thus, rate becomes times of initial rate. |
| 428 | **(c)**  The rate of reaction is  When the volume is reduced to the concentration of each reactant is increased by 3 times |
| 429 | **(a)** |
| 431 | **(d)**  Activation energy of a reaction is constant at constant temperature hence, |
| 432 | **(b)**  Rate  When volume is reduced by one fourth then concentration becomes 4 times  Hence, |
| 433 | **(b)**  The reactant taken in excess obeys zero order reaction;  . |
| 434 | **(a)**  For first order reaction,  =444s |
| 435 | **(d)**  For II order reaction . |
| 436 | **(b)**  We know,  Given, |
| 437 | **(d)**  If the concentration of reactants is increased by then rate constant remains same, because change of concentration has no effect on the rate constant |