Rate law and Rate constant

49. The reaction $2N_2O_5 \rightleftharpoons 2NO_2 + O_2$ follows first order kinetics. Hence, the molecularity of the reaction is
(a) Unimolecular
(b) Pseudo–unimolecular
(c) Bimolecular
(d) None of the above

50. A reaction involving two different reactants
(a) Can never be a second order reaction
(b) Can never be a unimolecular reaction
(c) Can never be a bimolecular reaction
(d) Can never be a first order reaction

51. By "the overall order of a reaction", we mean
(a) The number of concentration terms in the equation for the reaction
(b) The sum of powers to which the concentration terms are raised in the velocity equation
(c) The least number of molecules of the reactants needed for the reaction
(d) The number of reactants which take part in the reaction

52. Catalyst decomposition of hydrogen peroxide is a ..... order reaction
(a) First (b) Second
(c) Third (d) Zero

53. The half life of a first order reaction is
(a) Independent of the initial concentration of the reactant
(b) Directly proportional to the initial concentration of the reactants
(c) Inversely proportional to the initial concentration of the reactant
(d) Directly proportional to the square of the initial concentration of the reactant

54. The decomposition of N_2O_5 is a first order reaction represented by $N_2O_5 \rightarrow N_2O_4 + \frac{1}{2}O_2$. After 15 *minutes* the volume of O_2 produced is $9ml$ and at the end of the reaction $35ml$. The rate constant is equal to
(a) $\frac{1}{15} ln \frac{35}{44}$ (b) $\frac{1}{15} ln \frac{44}{26}$
(c) $\frac{1}{15} ln \frac{44}{35}$ (d) $\frac{1}{15} ln \frac{35}{26}$

55. The unit of specific reaction rate constant for a first order (if the concentration expressed in molarity) would be

(a) *mole* $litre^{-1}s^{-1}$ (b) *mole* $litre^{-1}$
(c) *mole* s^{-1} (d) s^{-1}

56. A first order reaction requires 30 minutes for 50% completion. The time required to complete the reaction by 75% will be
(a) 45 minutes
(b) 15 minutes
(c) 60 minutes
(d) None of these

57. Inversion of canesugar in dilute acid (conversion into glucose and fructose) is a
(a) Unimolecular reaction
(b) Bimolecular reaction
(c) Trimolecular reaction
(d) Pseudo-unimolecular reaction

58. The half life period of a first order reaction
(a) $\frac{0.693}{t}$ (b) $\frac{0.693}{K}$
(c) $\frac{2.303}{t}$ (d) $\frac{0.303}{K_1}$

59. The order of a reaction is said to be 2 with respect to a reactant *X*, when
(a) The rate of the reaction is proportional to [*X*]
(b) The rate of the reaction is proportional $[X]^2$
(c) Two molecules of *X* are present in the stoichiometric equation
(d) The reaction occurs in two steps

60. Decay constant of a reaction is $1.1 \times 10^{-9}/sec$, then the half life of the reaction is
(a) 1.2×10^8 (b) 6.3×10^8
(c) 3.3×10^8 (d) 2.1×10^8

61. If the half life period of a reaction is inversely proportional to the initial concentration, the order of the reaction is
(a) Zero (b) One
(c) Two (d) Three

62. Which one of the following statements is wrong
(a) Molecularity of a reaction is always a whole number
(b) Order and molecularity of a reaction need not be same
(c) Order of a reaction may be zero
(d) Order of a reaction depends upon the mechanism of the reaction

63. The velocity constant of first order reaction is expressed in the units
(a) Concentration per unit time
(b) Time per unit concentration
(c) Per unit time
(d) Unit time per unit concentration

64. For reation, $A + B \rightarrow$ products, it is found that the rate of the reaction is proportional to the concentration of *A*, but it is independent of the concentration of B, then
(a) The order of the reaction 2 and molecularity 1
(b) Molecularity of the reaction is 2 but order is 1
(c) Order is 2 and molecularity is 2
(d) Order of the reaction is 2 but molecularity is 0

65. For a zero order reaction
(a) The concentration of the reactant does not change during the reaction
(b) The concentration change only when the temperature changes
(c) The rate remains constant throughout
(d) The rate of the reaction is proportional to the concentration

66. If '*a*' is the initial concentration and '*n*' is the order of the reaction and the half life period is '*T*', then
(a) $T \propto a^{n-1}$ (b) $T \propto a^{n}$
(c) $T \propto \frac{1}{a^{n}}$ (d) $T \propto \frac{1}{a^{n-1}}$

67. In presence of HCl, sucrose gets hydrolysed into glucose and fructose. The concentration of sucrose was found to reduce form 0.4 *M* to 0.2 *M* in 1 hour and 0.1 *M* in 2 hours. The order of the reaction is
(a) Zero
(b) One
(c) Two
(d) None of these

68. The time of half change of a first order reaction in ..... initial concentration
(a) Proportional to
(b) Inversely proportional to
(c) Independent of
(d) Equal to

69. Half life period of a first order reaction is 138.6 minutes. The velocity constant of the reaction is
(a) $0.05\ min^{-1}$
(b) $0.00005\ min^{-1}$
(c) $0.005\ min^{-1}$
(d) $200\ min^{-1}$

70. An example of a pseudo – unimolecular reaction is
(a) Dissociation of hydrogen iodide
(b) Hydrolysis of methyl acetate in dilute solution
(c) Dissociation of phosphorus pentachloride
(d) Decomposition of hydrogen peroxide

71. About half life period of a first order reaction, which one of the following statements is generally false

(a) It is independent of initial concentration

(b) It is independent of temperature

(c) It decreases with the introduction of a catalyst

(d) It increases with increase of temperature

72. Decomposition of nitrogen pentoxide is known to be a first order reaction 75 percent of the oxide had decomposed in the first 24 minutes. At the end of an hour, after the start of the reaction, the amount of oxide left will be

(a) Nil (b) About 1%

(c) About 2% (d) About 3%

73. A reaction $2A \rightarrow$products is found to follow zero oder kinetics, then

(a) $\frac{dx}{dt} = k[A]^2$ (b) $\frac{dx}{dt} = k[A]^0$

(c) $\frac{dx}{dt} = k[A]$ (d) $\frac{dx}{dt} = k[2A]$