7. $CHCl_3 + Cl_2 \longrightarrow CCl_4 + HCl$

Rate law for above reaction will be

Rate $= k[CHCl_3][Cl_2]^2$

On the basis of information provided which of the following option will be correct ?
(a) Rate law for any chemical reaction can be predicted accurately by looking at balanced chemical equation.
(b) Rate law for a chemical reaction has to determine experimentally.
(c) Either determined experimentally or obtained from balanced chemical reaction, rate law will be same.
(d) None of the above is correct.

8. Which of the following statements is incorrect?
(a) Activation energy for the forward reaction equals to activation energy for the reverse reaction
(b) For a reversible reaction, an increase in temperature increases the reaction rate for both the forward and the backward reaction
(c) The larger the initial reactant concentration for a second order reaction, the shorter is its half-life.
(d) When Δt is infinitesimally small, the average rate equals the instantaneous rate

9. In a reaction $A \rightarrow$ Products, when start is made from 8.0×10^{-2} M of A, half-life is found to be 120 minute. For the initial concentration 4.0×10^{-2} M, the half-life of the reaction becomes 240 minute. The order of the reaction is :
(a) zero   (b) one   (c) two   (d) 0.5

10. During decomposition of an activated complex.
(i) energy is always released
(ii) energy is always absorbed
(iii) energy does not change
(iv) reactants may be formed
(a) (i), (ii) and (iii)   (b) (i) and (iv)
(c) (ii) and (iii)   (d) (ii), (iii) and (iv)

11. Which of the following statements is incorrect ?
(a) Energy is always released when activated complex decomposes to form products.
(b) Peak of the energy distribution curve corresponds to the most probable potential energy.
(c) Peak of the energy distribution curve corresponds to the most probable kinetic energy.
(d) When the temperature is raised maximum of energy distribution curve moves to higher energy value and broadens out.

12. A catalyst increases rate of reaction by
(a) decreasing enthalpy
(b) decreasing internal energy
(c) decreasing activation energy
(d) increasing activation energy

13. Consider a reaction $aG + bH \rightarrow$ Products. 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 order of the reaction is
(a) 0   (b) 1   (c) 2   (d) 3

14. For a first order reaction (A) $\rightarrow$ products the concentration of A changes from 0.1 M to 0.025 M in 40 minutes.
The rate of reaction when the concentration of A is 0.01 M is :
(a) 1.73×10^{-5} M/min   (b) 3.47×10^{-4} M/min
(c) 3.47×10^{-5} M/min   (d) 1.73×10^{-4} M/min

15. The given reaction
$2FeCl_3 + SnCl_2 \longrightarrow 2FeCl_2 + SnCl_4$
is an example of
(a) first order reaction   (b) second order reaction
(c) third order reaction   (d) None of these

16. In a first-order reaction A $\rightarrow$ B, if k is rate constant and initial concentration of the reactant A is 0.5 M, then the half-life is
(a) $\dfrac{\log 2}{k}$ (b) $\dfrac{\log 2}{k\sqrt{0.5}}$
(c) $\dfrac{\ln 2}{k}$ (d) $\dfrac{0.693}{0.5k}$

17. The integrated rate equations can be determined for
(a) zero order reactions   (b) first order reactions
(c) second order reactions   (d) Both (a) and (b)

18. The rate constant, the activation energy and the arrhenius parameter of a chemical reaction at $25°C$ are $3.0 \times 10^{-4} s^{-1}$, 104.4 kJ mol^{-1} and 6.0×10^{14} s^{-1} respectively. The value of the rate constant as $T \rightarrow \infty$ is
(a) 2.0×10^{18} s^{-1} (b) $6.0 \times 10^{14} s^{-1}$
(c) Infinity   (d) 3.6×10^{30} s^{-1}

19. According to the adsorption theory of catalysis, the speed of the reaction increases because
(a) in the process of adsorption, the activation energy of the molecules becomes large
(b) adsorption produces heat which increases the speed of the reaction
(c) adsorption lowers the activation energy of the reaction
(d) the concentration of product molecules at the active centres of the catalyst becomes high due to adsorption.

20. Consider a general chemical change $2A + 3B \rightarrow$ products. The rate with respect to A is r_1 and that with respect to B is r_2. The rates r_1 and r_2 are related as
(a) $3r_1 = 2r_2$ (b) $r_1 = r_2$
(c) $2r_1 = 3r_2$ (d) $r_1^2 = 2r_2^2$

21. In a first order reaction, the concentration of the reactant, decreases from 0.8 M to 0.4 M in 15 minutes. The time taken for the concentration to change from 0.1 M to 0.025 M is
(a) 7.5 minutes   (b) 15 minutes
(c) 30 minutes   (d) 60 minutes