Date Planned : __ / __ / __	Daily Tutorial Sheet-2	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-1	Exact Duration :_____

16. In the presence of a catalyst, the heat evolved or absorbed during reaction :

(A) decreases

(B) increases

(C) remains unaffected

(D) may increase or decrease

17. If k_1 = rate constant at temperature T_1 and k_2 = rate constant at temperature T_2 for a first order reaction, then which of the following relations is correct? (E_a : activation energy)

(A) $\log\frac{k_1}{k_2}=\frac{2.303\,E_a}{R}\left(\frac{T_2-T_1}{T_1T_2}\right)$ **(B)** $\log\frac{k_2}{k_1}=\frac{E_a}{2.303R}\left(\frac{T_2-T_1}{T_1T_2}\right)$

(C) $\log\frac{k_2}{k_1}=\frac{E_a}{2.303R}\left(\frac{T_1T_2}{T_2+T_1}\right)$ **(D)** $\log\frac{k_1}{k_2}=\frac{E_a}{2.303R}\left(\frac{T_1T_2}{T_2-T_1}\right)$

18. A catalyst :

(A) increases the average kinetic energy of the reacting molecules

(B) decreases the value of enthalpy change in the reaction

(C) reduces the time required for reaching the equilibrium state in the reaction

(D) decreases the rate of backward reaction

19. Diazonium salt decomposes as : $C_6H_5N_2^+Cl^- \longrightarrow C_6H_5Cl + N_2$. At 0°C, the evolution of N_2 becomes two times faster when the initial concentration of the salt is doubled. Therefore, the reaction is :

(A) first order

(B) second order

(C) independent of the initial concentration of the salt

(D) zero order

20. Which of the following statements is not correct for order of a reaction?

(A) Order of a reaction can be determined experimentally

(B) It is the sum of the powers of concentration terms in the rate law expression

(C) It does not necessarily depend upon the stoichiometric coefficients

(D) Order of a reaction cannot be fractional

21. For a given reaction of first order, it takes 20 minutes for the concentration to drop from 1.0M to 0.6M. The time required for the concentration to drop from 0.6M to 0.36M will be:

(A) more than 20 minutes

(B) less than 20 minutes

(C) equal to 20 minutes

(D) infinity

22. $\frac{7}{8}$th of the active nuclei present in a radioactive sample has decayed in 8s. The half-life of the sample is :

(A) 2s **(B)** 1s **(C)** 7s **(D)** $\frac{8}{3}$s

23. When ethyl acetate was hydrolysed in presence of 0.1 N HCl, the rate constant was found to be $5.40\times10^{-3}s^{-1}$. But when 0.1 N H_2SO_4 was used for the hydrolysis, the rate constant was found to be $6.20\times10^{-3}s^{-1}$. From these values we can say that :

(A) H_2SO_4 is stronger acid than HCl

(B) H_2SO_4 is weaker acid than HCl

(C) Both the acids have equal strength

(D) The data is insufficient to compare the strengths of HCl and H_2SO_4

24. The amount of radioactive $_{53}I^{128}$ ($t_{1/2}$ = 25 minutes) left after 50 minutes will be :

(A) 1/4 **(B)** 1/2 **(C)** 1/3 **(D)** None of these

25. The half life of a first order reaction is 10 minutes. If initial amount is 0.08 mole/litre and concentration at some instant 't' is 0.01 mol/litre, then the value of 't' is :

(A) 10 min. **(B)** 30 min. **(C)** 20 min. **(D)** 40 min.

26. The rate of a gaseous reaction is given by the expression k [A][B]. If the volume of the reaction vessel is suddenly reduced to $1/4^{th}$ of the initial volume, the reaction rate relative to original rate will be :

(A) 1/10 **(B)** 1/8 **(C)** 8 **(D)** 16

27. For an endothermic reaction, where ΔH represents the enthalpy of the reaction in kJ/mol, the value for the energy of activation will be :

(A) less than ΔH **(B)** zero **(C)** more than ΔH **(D)** equal to ΔH

28. In the first order reaction, 75% of the reactant disappeared in 1.388 hr. Calculate the rate constant of the reaction :

(A) $3.6\times10^{-3}s^{-1}$ **(B)** $2.8\times10^{-4}s^{-1}$ **(C)** $17.2\times10^{-3}s^{-1}$ **(D)** $1.8\times10^{-3}s^{-1}$

29. In the reversible reaction : $2NO_2 \underset{k_2}{\overset{k_1}{\rightleftharpoons}} N_2O_4$; the rate of disappearance of NO_2 is equal to :

(A) $\frac{2k_1}{k_2}\left[NO_2\right]^2$ **(B)** $2k_1[NO_2]^2 - 2k_2[N_2O_4]$

(C) $2k_1\left[NO_2\right]^2 - k_2\left[N_2O_4\right]$ **(D)** $\left(2k_1 - k_2\right)\left[NO_2\right]$

30. The rate constant, the activation energy and the Arrhenius parameter of a chemical reaction at 25°C are $3.0\times10^{-4}s^{-1}$, 104.4 kJ mol^{-1}, and $6.0\times10^{14}s^{-1}$ respectively. The value of the rate constant as $T\to\infty$ is:

(A) $2.0\times10^{18}s^{-1}$ **(B)** $6.0\times10^{14}s^{-1}$ **(C)** Infinity **(D)** $3.6\times10^{30}s^{-1}$