Class 12th Chemistry

1. The complexes $[PtCl_2(NH_3)_4]Br_2$ and $[PtBr_2(NH_3)_4]Cl_2$ are example for isomerism
   a) Geometrical b) Optical c) Ionization d) Linkage

2. Which one of the following octahedral complexes will not show geometrical isomerism? (A and B are monodentateligands)
   a) $[MA_4B_2]$ b) $[MA_5B]$ c) $[MA_2B_4]$ d) $[MA_3B_3]$

3. Which order is correct in spectrochemical series of ligands?
   a) $Cl^- < F^- < [C_2O_4]^{2-} < NO_2^- < CN^-$
   b) $CN^- < [C_2O_4]^{2-} < Cl^- > NO_2^- < F^-$
   c) $[C_2O_4]^{2-} < F^- < Cl^- > NO_2^- < CN^-$
   d) $F^- < Cl^- < NO_2^- < CN^- < [C_2O_4]^{2-}$

4. $[Co(NH_3)_4(NO_2)_2]Cl$ exhibits:
   a) Ionization isomerism, geometrical isomerism and optical isomerism
   b) Linkage isomerism, geometrical isomerism and optical isomerism
   c) Linkage isomerism, ionization isomerism and optical isomerism
   d) Linkage isomerism, ionization isomerism and geometrical isomerism

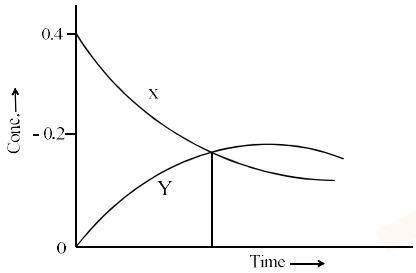
5. Which does not obey EAN rule?
   a) $[Cu(NH_3)_4]^{2+}$ b) $[Zn(OH)_4]^{2-}$ c) $[HgI_4]^{2-}$ d) $Fe(CO)_5$

6. The following mechanism has been proposed for the reaction of NO with Br_2 to form NOBr
   $NO(g) + Br_2(g) \rightleftharpoons NOBr_2(g)$
   $NOBr_2(g) + NO(g) \rightarrow 2NOBr(g)$
   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

7. The rate of a chemical reaction doubles for every 10°C rise of temperature. If the temperature is raised by 50°C, the rate of the reaction increases by about
   a) 10 times b) 24 times c) 32 times d) 64 times

8. Mathematical expression for $t_{1/4}$ i.e., when $(1/4)$th reaction is over following first order kinetics can be given by
   a) $t_{1/2} = \frac{2.303}{k}\log 4$ b) $t_{1/2} = \frac{2.303}{k}\log 2$ c) $t_{1/2} = \frac{2.303}{k}\log\frac{4}{3}$ d) $t_{1/2} = \frac{2.303}{k}\log\frac{3}{4}$

9. The accompanying figure depicts the change in concentration of species X and Y for the reaction $X \longrightarrow Y$, as a function of time. The point of intersection of the two curves represents:



a) $t_{1/2}$ b) $t_{3/4}$

a) $t_{2/3}$ b) Data is insufficient to predict

10. The rate constant (k') of one of the reaction is found to be double that of the rate constant (k'') of another reaction. Then the relationship between the corresponding activation energies of the two reaction ($E_a'$and E_a'') can be represented as

a) $E_a' > E_a''$ b) $E_a' = 4E''$ c) $E_1' = E_a''$ d) $E_a' < E_a''$

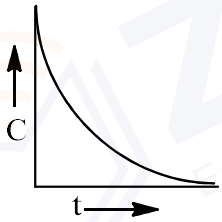
11. The data for the reaction, A+B→C

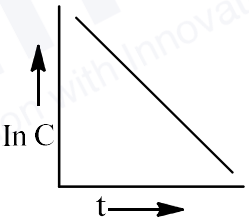
Ex	$[A]_0$	$[B]_0$	Initial rate
1	0.012	0.035	0.10
2	0.024	0.070	0.80
3	0.024	0.035	0.10
4	0.012	0.070	0.80

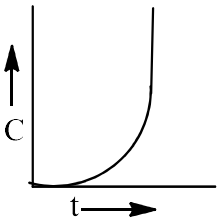
The rate law corresponds to the above data is

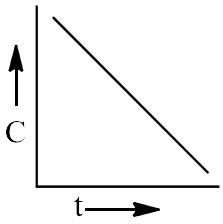
a) $rate = k[B]^3$ b) $rate = k[B]^4$ c) $rate = k[A][B]^3$ d) $rate = k\,[A]^2[B]^2$

12. The plot between concentration versus time for a zero order reaction is represented by

a) 

b) 

c) 

d) 

13. For the reaction, $N_2O_5 \longrightarrow 2NO_2 + \frac{1}{2}O_2$

Given, $-\frac{d[N_2O_5]}{dt} = K_1[N_2O_5]$

$\frac{d[NO_2]}{dt} = K_2[N_2O_5]$

and $\frac{d[O_2]}{dt} = K_3[N_2O_5]$

The relation in between K_1, K_2 and K_3 is:

a) $2K_1 = K_2 = 4K_3$ b) $K_1 = K_2 = K_3$ c) $2K_1 = 4K_2 = K_3$ d) None of these

14. 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) $\frac{2k_1}{k_2}[NO_2]^2$ b) $2k_1[NO_2]^2 - 2k_2[N_2O_4]$

c) $2k_2[NO_2]^2 - k_2[N_2O_4]$ d) $(2k_1 - k_2)[NO_2]$

15. For the reaction $2NO_2 + F_2 \longrightarrow 2NO_2F$, following mechanism has been provided,

$NO_2 + F_2 \xrightarrow{\text{Slow}} NO_2F + F$

$NO_2 + F \xrightarrow{\text{Fast}} NO_2F$

Thus, rate expression of the above reaction can be written as:

a) $r = K[NO_2]^2[F_2]$ b) $r = K[NO_2][F_2]$ c) $r = K[NO_2]$ d) $r = K[F_2]$

16. A galvanic cell is composed of two hydrogen electrodes, one of which is a standard one. In which of the following solutions should the other electrode be immersed to get maximum e.m.f.?

a) 0.1 M HCl b) 0.1 M CH_3COOH c) 0.1 M H_3PO_4 d) 0.1 M H_2SO_4

17. EMF of hydrogen electrode in term of pH is (at 1 atm pressure)

a) $E_{H_2} = \frac{RT}{F} \times pH$ b) $E_{H_2} = \frac{RT}{F} . \frac{1}{\text{p}H}$

c) $E_{H_2} = \frac{2.303RT}{F} . \text{p}H$ d) $E_{H_2} =$ - 0.0591 pH

18. When Zn piece is kept in $CuSO_4$ solution, copper gets precipitated because:

a) Standard reduction potential of zinc is more than copper

b) Standard reduction potential of zinc is less than copper

c) Atomic number of zinc is larger than copper

d) Atomic number of zinc is lower than copper

19. Standard reduction potential for, $Li^+|$ Li, $Zn^{2+}|$Zn, $H^+|H_2$ and Ag^+ | Ag is $-3.05, -0.762, 0.00$ and $+80$ V. Which has highest reducing capacity?

a) Ag b) H_2 c) Zn d) Li

20. The value of Λ_{eq}^{∞} for NH_4Cl, NaOH and NaCl are respectively,149.74,248.1 and 126.4Ω^{-1}cm^{2}equiv^{-1}. The value of $\Lambda_{eq}^{\infty}$of NH_4OH is

a) 371.44 b) 271.44

c) 71.44 d) Cannot be predicted from given data

21. Consider the following disproportionation

$2ClO_3^- \rightleftharpoons ClO_2^- + ClO_4^-$

If the initial concentration of perchlorate ion is 0.1 M what it would be at equilibrium at 298 K?

$\left(E^{\circ}_{ClO_4^- / ClO_3^-} = 0.36 \text{ V and } E^{\circ}_{ClO_3^- / ClO_2^-} = 0.33 \text{ V}\right)$

a) 0.1 M b) 0.05 M c) 0.07 M d) 0.19 M

22. Which of the following electrolytic solutions has the least specific conductance?

a) 0.02 N b) 0.2 N c) 2 N d) 0.002 N

23. Which substance is obtained in the solution on electrolysis of aqueous $CuSO_4$ solution using graphite electrodes?

a) H_2O b) H_2SO_4 c) Na_2SO_4 d) $Cu(OH)_2$

24. A solid is made of two elements $X$and Z. The atoms Z are in ccp arrangement while the atom X occupy all the tetrahedral sites. What is the formula of the compound?

a) XZ b) XZ_2 c) X_2Z d) X_2Z_3

25. Frenkel defect is caused due to
    a) The shift of a positive ion from its normal lattice site to an interstitial site
    b) An ion missing from the normal lattice site creating a vacancy
    c) An extra positive ion occupying an interstitial position in the lattice
    d) An extra negative ion occupying an interstitial position in the lattice

ANSWER KEY

1. (C)	2. (B)	3. (A)	4. (D)	5. (A)	6. (D)	7. (C)
8. (C)	9. (A)	10. (D)	11. (C)	12. (D)	13. (A)	14. (B)
15. (B)	16. (D)	17. (D)	18. (B)	19. (D)	20. (B)	21. (D)
22. (D)	23. (A)	24. (C)	25. (A)			