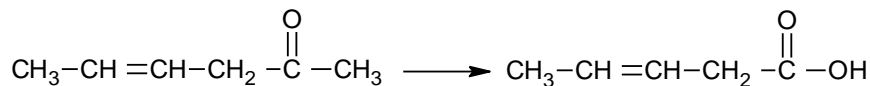


- The vitamin that helps in clotting of blood is
(a) A (b) B₂ (c) C (d) K
- The polymer containing five methylene groups in its repeating unit is
(a) Nylon 6, 6 (b) Dacron (c) Nylon 6 (d) Bakelite
- Cis-1, 4-polyisoprene is called
(a) Buna-N (b) Buna-S (c) Neoprene (d) Natural rubber
- Which cleansing agent gets precipitated in hard water?
(a) Sodium lauryl sulphate (b) Cetyl trimethyl ammonium bromide
(c) Sodium stearate (d) Sodium dodecyl benzene sulphonate
- Anti-histamine among the following is
(a) Bromopheneramine (b) Amoxycillin (c) Morphine (d) Chloroxylenol
- The elements in which electrons are progressively filled in 4f orbital are called
(a) Actinoids (b) Lanthanoids (c) Transition elements (d) Halogens
- Incorrect statement with reference to *Ce* ($Z = 58$)
(a) Ce^{4+} is a reducing agent
(b) Atomic size of *Ce* is more than that of *Lu*
(c) *Ce* in +3 oxidation state is more
(d) *Ce* shows common oxidation states of +3 and +4
- A mixture of *NaCl* and $K_2Cr_2O_7$ is heated with conc. H_2SO_4 , deep red vapours are formed. Which of the following statement is false?
(a) The vapours give a yellow solution with *NaOH*
(b) The vapours contain CrO_2Cl_2 and Cl_2
(c) The vapours contain CrO_2Cl_2 only
(d) The vapours when passed into lead acetate in acetic acid gives a yellow precipitate
- Which of the following statement is wrong?
(a) In highest oxidation states, the transition metals show acidic character
(b) Metals in highest oxidation states are more stable in oxides than in fluorides
(c) Mn^{3+} and Co^{3+} are oxidizing agents in aqueous solution
(d) All elements of 3d series exhibit variable oxidation states
- Which among the following is the strongest ligand?
(a) CN^- (b) *CO* (c) NH_3 (d) *en*
- Relative lowering of vapour pressure of dilute solution of glucose dissolved in 1 kg of water is 0.002. The molality of the solution is
(a) 0.004 (b) 0.111 (c) 0.222 (d) 0.021

12. One litre solution of $MgCl_2$ is electrolyzed completely by passing a current of 1A for 16 min 5 sec. The original concentration of $MgCl_2$ solution was
(Atomic mass of $Mg = 24$)
- (a) $5 \times 10^{-3} M$ (b) $0.5 \times 10^{-3} M$ (c) $5 \times 10^{-2} M$ (d) $1.0 \times 10^{-2} M$
13. An aqueous solution of $CuSO_4$ is subjected to electrolysis using inert electrodes. The pH of the solution will
- (a) increase
(b) decrease
(c) remains unchanged
(d) increase or decrease depending on the strength of the current
14. Give : $E^\circ_{Mn^{+4}|Mn^{+2}} = 1.2V$, then $E^\circ_{Mn^{+7}|Mn^{+4}}$ is
- (a) 0.3 V (b) 1.7 V (c) 0.1 V (d) 2.1 V
15. The plot of $t_{1/2} v/s [R]_0$ for a reaction is a straight-line parallel to x -axis. The unit for the rate constant of this reaction is
- (a) $\text{mol } L^{-1} s$ (b) $L \text{ mol}^{-1} s^{-1}$ (c) $\text{mol } L^{-1} s^{-1}$ (d) s^{-1}
16. The mass of $AgCl$ precipitated when a solution containing 11.70 g of $NaCl$ is added to a solution containing 3.4 g of $AgNO_3$ is
(Atomic mass of $Ag = 108$, Atomic mass of $Na = 23$)
- (a) 5.74 g (b) 2.87 g (c) 1.17 g (d) 6.8 g
17. Two particles A and B are in motion. If the wavelength associated with 'A' is 33.33 nm, the wavelength associated with 'B' whose momentum is $\frac{1}{3}$ of 'A' is
- (a) $1.0 \times 10^{-8} m$ (b) $1.25 \times 10^{-7} m$ (c) $2.5 \times 10^{-8} m$ (d) $1.0 \times 10^{-7} m$
18. The first ionization enthalpy of the following elements are in the order:
- (a) $C < N < Si < P$ (b) $P < Si < C < N$ (c) $P < Si < N < C$ (d) $Si < P < C < N$
19. Solubility of $AgCl$ is least in
- (a) 0.1M $NaCl$ (b) 0.1M $BaCl_2$ (c) Pure water (d) 0.1M $AlCl_3$
20. Which of the following equations does NOT represent Charles's law for a given mass of gas at constant pressure?
- (a) $\frac{V}{T} = K$ (b) $\log K = \log V + \log T$
(c) $\log V = \log K + \log T$ (d) $\frac{d(\ln V)}{dT} = \frac{1}{T}$

21. Which is the most suitable reagent for the following conversion?



- (a) Tollen's reagent (b) Benzoyl peroxide
(c) I_2 and NaOH solution (d) Sn and NaOH solution

22. Which of the following is least soluble in water at 298 K ?

- (a) CH_3NH_2 (b) $(\text{CH}_3)_2\text{NH}$ (c) $(\text{CH}_3)_3\text{N}$ (d) $\text{C}_6\text{H}_5\text{NH}_2$

23. If Aniline is treated with 1:1 mixture of *con.HNO*₃ and *con.H*₂SO₄, *p*-nitroaniline and *m*-nitroaniline are formed nearly in equal amounts. This is due to

- (a) *m*-directing property of $-\text{NH}_2$ group
(b) *m* & *p* directing property of $-\text{NH}_2$ group
(c) protonation of $-\text{NH}_2$ which causes deactivation of benzene ring
(d) isomerization of some *p*-nitroaniline into *m*-nitroaniline

24. In nucleic acids, the nucleotides are joined together by

- (a) Phosphoester linkage (b) Phosphodisulphide linkage
(c) Phosphodiester linkage (d) Sulphodiester linkage

25. Which of the following is generally water insoluble?

- (a) Fibrous protein (b) Amylose (c) Vitamin-C (d) Glycine

26. Which of the following possess net dipole moment?

- (a) SO_2 (b) BeCl_2 (c) BF_3 (d) CO_2

27. The number of π -bonds and σ -bonds present in naphthalene are respectively

- (a) 6, 19 (b) 5, 11 (c) 5, 19 (d) 5, 20

28. The reaction in which $\Delta H > \Delta U$ is

- (a) $\text{N}_{2(g)} + \text{O}_{2(g)} \longrightarrow 2\text{NO}_{(g)}$ (b) $\text{N}_{2(g)} + 3\text{H}_{2(g)} \longrightarrow 2\text{NH}_{3(g)}$
(c) $\text{CaCO}_{3(s)} \longrightarrow \text{CaO}_{(s)} + \text{CO}_{2(g)}$ (d) $\text{CH}_{4(g)} + 2\text{O}_{2(g)} \longrightarrow \text{CO}_{2(g)} + 2\text{H}_2\text{O}_{(l)}$

29. The number of moles of electron required to reduce 0.2 mole of $\text{Cr}_2\text{O}_7^{2-}$ to Cr^{+3}

- (a) 1.2 (b) 12 (c) 6 (d) 0.6

30. In the reaction $\text{B}(\text{OH})_3 + 2\text{H}_2\text{O} \longrightarrow [\text{B}(\text{OH})_4]^- + \text{H}_3\text{O}^+$, $\text{B}(\text{OH})_3$ functions as

- (a) Protonic acid (b) Bronsted acid
(c) Lewis base (d) Lewis acid

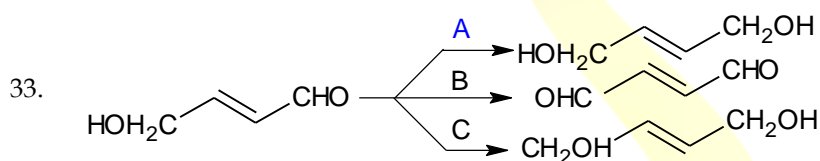
31. Match the following acids with their pKa values

Acid		pKa	
(A)	Phenol	i.	16
(B)	<i>p</i> -Nitrophenol	ii.	0.78
(C)	Ethanol	iii.	10
(D)	Picric acid	iv.	7.1

a	b	c	d
(a) iii	iv	i	ii
(b) iii	i	iv	ii
(c) ii	i	iii	iv
(d) iv	ii	iii	i

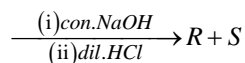
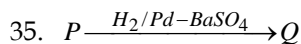
32. Which of the following can be used to test the acidic nature of ethanol?

- (a) Blue litmus solution
 (b) NaHCO_3
 (c) Na_2CO_3
 (d) Na metal



The reagent *A*, *B* and *C* respectively are

- (a) H_2 / Pd , PCC , NaBH_4
 (b) NaBH_4 , PCC , H_2 / Pd
 (c) NaBH_4 , alk.KMnO_4 , H_2 / Pd
 (d) H_2 / Pd , alk.KMnO_4 , NaBH_4
34. Propanoic acid undergoes HVZ reaction to give chloropropanoic acid. The product obtained is
- (a) stronger acid than propanoic acid
 (b) weaker acid than propanoic acid
 (c) as stronger as propanoic acid
 (d) stronger than dichloropropanoic acid



R and *S* form benzyl benzoate when treated with each other. Hence *P* is

- (a) $\text{C}_6\text{H}_5\text{CHO}$
 (b) $\text{C}_6\text{H}_5\text{COCl}$
 (c) $\text{C}_6\text{H}_5\text{CH}_2\text{OH}$
 (d) $\text{C}_6\text{H}_5\text{COOH}$
36. Which of the following is a network crystalline solid?
- (a) I_2
 (b) NaCl
 (c) AlN
 (d) Ice

37. The number of atoms in 2.4 g of body centred cubic crystal with edge length 200 pm is (density = 10 g cm^{-3} , $N_A = 6 \times 10^{23}$ atoms/mol)
- (a) 6×10^{22} (b) 6×10^{23} (c) 6×10^{20} (d) 6×10^{19}
38. 1 mole of NaCl is doped with 10^{-5} mole of SrCl_2 . The number of cationic vacancies in the crystal lattice will be
- (a) 6.022×10^{18} (b) 6.022×10^{23} (c) 6.022×10^{15} (d) 12.044×10^{20}
39. A non-volatile solute, 'A' tetramerises in water to the extent of 80%. 2.5 g of 'A' in 100 g of water, lowers the freezing point by 0.3°C . The molar mass of A in g mol^{-1} is (K_f for water = $1.86 \text{ K kg mol}^{-1}$)
- (a) 62 (b) 155 (c) 221 (d) 354
40. Solution 'A' contains acetone dissolved in chloroform and solution 'B' contains acetone dissolved in carbon disulphide. The type of deviations from Raoult's law shown by solutions A and B, respectively are
- (a) positive and positive (b) negative and negative
(c) positive and negative (d) negative and positive
41. Among the following, the main reactions occurring in blast furnace during extraction of iron from haematite are
- i. $\text{Fe}_2\text{O}_3 + 3\text{CO} \longrightarrow 2\text{Fe} + 3\text{CO}_2$ ii. $\text{FeO} + \text{SiO}_2 \longrightarrow \text{FeSiO}_3$
iii. $\text{Fe}_2\text{O}_3 + 3\text{C} \longrightarrow 2\text{Fe} + 3\text{CO}$
iv. $\text{CaO} + \text{SiO}_2 \longrightarrow \text{CaSiO}_3$
- (a) i and ii (b) ii and iii (c) iii and iv (d) i and iv
42. Which of the following pair contains 2 lone pair of electrons on the central atom?
- (a) I_3^+ , H_2O (b) XeF_4 , NH_3 (c) H_2O , NF_3 (d) SO_4^{2-} , H_2S
43. Which of the following statement is correct?
- (a) Cl_2 oxidises H_2O to O_2 but F_2 does not
(b) F_2 oxidises H_2O to O_2 but Cl_2 does not
(c) Cl_2 is a stronger oxidising agent than F_2
(d) Fluoride is a good oxidising agent
44. 0.1 mole of XeF_6 is treated with 1.8 g of water. The product obtained is
- (a) XeO_3 (b) XeOF_4 (c) XeO_2F_2 (d) $\text{Xe} + \text{XeO}_3$
45. In the reaction of gold with aquaregia, oxidation state of Nitrogen changes from
- (a) +4 to +2 (b) +5 to +2 (c) +6 to +4 (d) +3 to +1

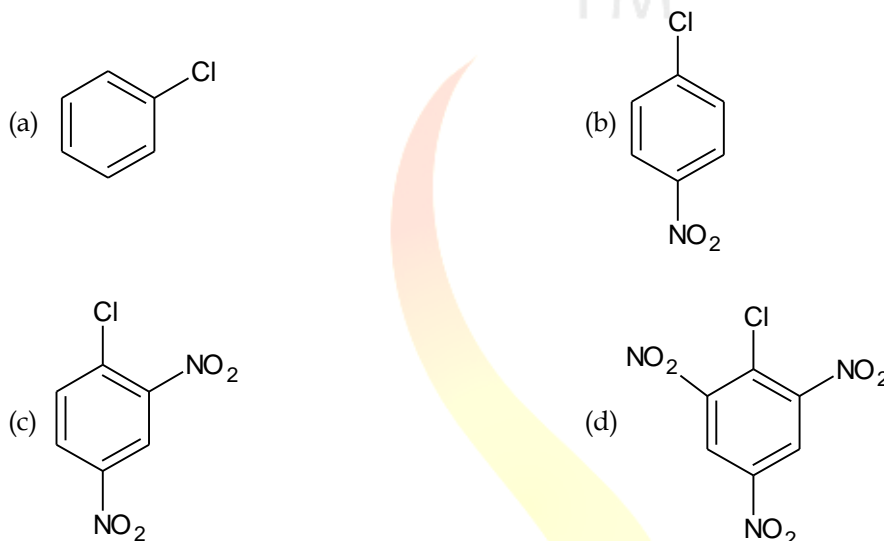
46. Addition of excess of $AgNO_3$ to an aqueous solution of 1 mole of $PdCl_2 \cdot 4NH_3$ gives 2 moles of $AgCl$. The conductivity of this solution corresponds to

- (a) 1:1 electrolyte (b) 1:2 electrolyte (c) 1:3 electrolyte (d) 1:4 electrolyte

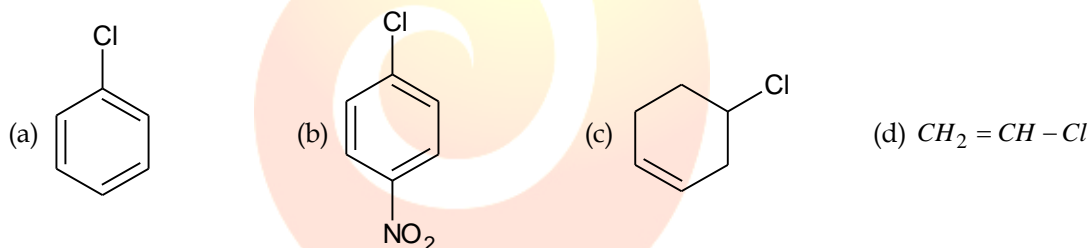
47. The formula of pentaquanitratochromium(III) nitrate is,

- (a) $[Cr(H_2O)_6](NO_3)_3$ (b) $[Cr(H_2O)_5(NO_3)](NO_3)_2$
 (c) $[Cr(H_2O)_6](NO_2)_2$ (d) $[Cr(H_2O)_5(NO_2)]NO_3$

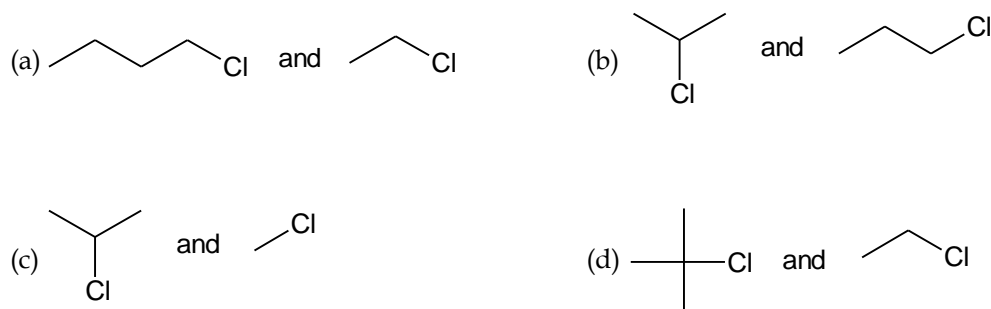
48. Which of the following halide undergoes hydrolysis on warming with water/aqueous $NaOH$?



49. The compound having longest $C-Cl$ bond is



50. The alkyl halides required to prepare  by Wurtz reaction are



51. Which is a wrong statement?
- (a) rate constant $k =$ Arrhenius constant A : if $E_a = 0$
 - (b) $\ln k$ vs $\frac{1}{T}$ plot is a straight line
 - (c) $e^{-E_a/RT}$ gives the fraction of reactant molecules that are activated at the given temperature
 - (d) presence of catalyst will not alter the value of E_a
52. 1 L of 2 M CH_3COOH is mixed with 1 L of 3M C_2H_5OH to form an ester. The rate of the reaction with respect to the initial rate when each solution is diluted with an equal volume of water will be
- (a) 0.25 times
 - (b) 0.5 times
 - (c) 2 times
 - (d) 4 times
53. Which of the following is an example of homogeneous catalysis?
- (a) oxidation of NH_3 in Ostwald's process
 - (b) oxidation of SO_2 in lead chamber process
 - (c) oxidation of SO_2 in contact process
 - (d) manufacture of NH_3 by Haber's process
54. Critical Micelle concentration for a soap solution is $1.5 \times 10^{-4} \text{ mol L}^{-1}$. Micelle formation is possible only when the concentration of soap solution in mol L^{-1} is
- (a) 2.0×10^{-3}
 - (b) 7.5×10^{-5}
 - (c) 4.6×10^{-5}
 - (d) 1.1×10^{-4}
55. Oxidation state of copper is +1 in
- (a) Malachite
 - (b) Azurite
 - (c) Cuprite
 - (d) Chalcopyrite
56. The metal nitrate that liberates NO_2 on heating
- (a) $NaNO_3$
 - (b) KNO_3
 - (c) $LiNO_3$
 - (d) $RbNO_3$
57. Which of the following is NOT true regarding the usage of hydrogen as a fuel?
- (a) High calorific value
 - (b) Combustion product is ecofriendly
 - (c) The combustible energy of hydrogen can be directly converted to electrical energy in a fuel cell
 - (d) Hydrogen gas can be easily liquefied and stored
58. Resonance effect is not observed in
- (a) $CH_2 = CH - CH = CH_2$
 - (b) $CH_2 = CH - Cl$
 - (c) $CH_2 = CH - C \equiv N$
 - (d) $CH_2 = CH - CH_2 - NH_2$
59. 2-butyne is reduced to trans-but-2-ene using
- (a) $H_2 | Ni$
 - (b) $H_2 | Pd - C$
 - (c) Na in liq. NH_3
 - (d) Zn in dil. HCl

60. Eutrophication causes

(a) increase of nutrients in water

(b) reduction in dissolved oxygen

(c) reduction in water pollution

(d) decreases BOD

TM

