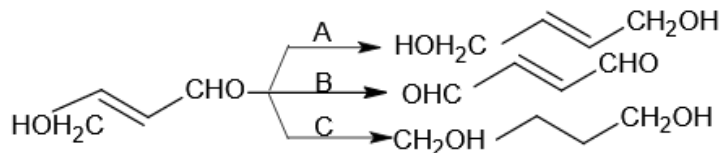


# KCET-2019 (Chemistry)



- Which of the following possess net dipole moment?
  - $\text{BF}_3$
  - $\text{SO}_2$
  - $\text{CO}_2$
  - $\text{BeCl}_2$
- The number of  $\pi$ -bonds and  $\sigma$ -bonds present in naphthalene are respectively
  - 5, 19
  - 6, 19
  - 5, 20
  - 5, 11
- The reaction in which  $\Delta H > \Delta U$  is
  - $\text{CaCO}_{3(s)} \longrightarrow \text{CaO}_{(s)} + \text{CO}_{2(g)}$
  - $\text{N}_{2(g)} + \text{O}_{2(g)} \longrightarrow 2\text{NO}_{(g)}$
  - $\text{CH}_{4(g)} + 2\text{O}_{2(g)} \longrightarrow \text{CO}_{2(g)} + 2\text{H}_2\text{O}_{(l)}$
  - $\text{N}_{2(g)} + 3\text{H}_{2(g)} \longrightarrow 2\text{NH}_{3(g)}$
- The number of moles of electron required to reduce 0.2 mole of  $\text{Cr}_2\text{O}_7^{2-}$  to  $\text{Cr}^{+3}$ 
  - 6
  - 1.2
  - 0.6
  - 12
- In the reaction  $\text{B(OH)}_3 + 2\text{H}_2\text{O} \longrightarrow [\text{B(OH)}_4]^- + \text{H}_3\text{O}^+$   $\text{B(OH)}_3$  functions as
  - Lewis base
  - Protonic acid
  - Lewis acid
  - Bronsted acid
- Match the following acids with their pKa values :
 

Acid	pKa						
a. Phenol	i. 16						
b. P-Nitrophenol	ii. 0.78						
c. Ethanol	iii. 10						
d. Picric acid	iv. 7.1						
<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>
a. ii	i	iii	iv	b. iii	iv	i	ii
c. iv	ii	iii	i	d. iii	i	iv	ii
- Which of the following can be used to test the acidic nature of ethanol?
  - $\text{Na}_2\text{CO}_3$
  - Blue litmus solution
  - Na metal
  - $\text{NaHCO}_3$
- The reagents A, B and C respectively are



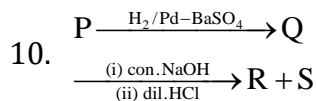
- $\text{NaBH}_4$ , alk.  $\text{KMnO}_4$ ,  $\text{H}_2/\text{Pd}$
- $\text{H}_2/\text{Pd}$ , PCC,  $\text{NaBH}_4$
- $\text{H}_2/\text{Pd}$ , alk.  $\text{KMnO}_4$ ,  $\text{NaBH}_4$
- $\text{NaBH}_4$ , PCC,  $\text{H}_2/\text{Pd}$

# KCET-2019 (Chemistry)



9. Propanoic acid undergoes HVZ reaction to give chloropropanoic acid. The product obtained is

- a. As stronger as propanoic acid
- b. Stronger acid than propanoic acid
- c. Stronger than dichloropropanoic acid
- d. Weaker acid than propanoic acid



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

- a.  $C_6H_5CH_2OH$
- b.  $C_6H_5CHO$
- c.  $C_6H_5COOH$
- d.  $C_6H_5COCl$

11. Among the following, the main reactions occurring in blast furnace during extraction of iron from haematite are

- i.  $Fe_2O_3 + 3CO \longrightarrow 2Fe + 3CO_2$
- ii.  $FeO + SiO_2 \longrightarrow FeSiO_3$
- iii.  $Fe_2O_3 + 3C \longrightarrow 2Fe + 3CO$
- iv.  $CaO + SiO_2 \longrightarrow CaSiO_3$

- a. iii and iv
- b. i and ii
- c. i and iv
- d. ii and iii

12. Which of the following pair contains 2 lone pair of electrons on the central atom?

- a.  $H_2O, NF_3$
- b.  $I_3^+, H_2O$
- c.  $SO_4^{2-}, H_2S$
- d.  $XeF_4, NH_3$

13. Which of the following statement is correct?

- a.  $Cl_2$  is a stronger oxidizing agent than  $F_2$ .
- b.  $Cl_2$  oxidises  $H_2O$  to  $O_2$  but  $F_2$  does not.
- c. Fluoride is a good oxidizing agent.
- d.  $F_2$  oxidises  $H_2O$  to  $O_2$  but  $Cl_2$  does not.

14. 0.1 mole of  $XeF_6$  is treated with 1.8g of water. The product obtained is

- a.  $XeO_2F_2$
- b.  $XeO_3$
- c.  $Xe + XeO_3$
- d.  $XeOF_4$

15. In the reaction of gold with aquaregia, oxidation state of Nitrogen changes from

- a. +6 to +4
- b. +4 to +2
- c. +3 to +1
- d. +5 to +2

16. The vitamin that helps in clotting of blood is

- a. C
- b. A
- c. K
- d.  $B_2$

# KCET-2019 (Chemistry)



17. The polymer containing five methylene groups as its repeating unit is
- Nylon 6
  - Nylon 6, 6
  - Bakelite
  - Dacron
18. Cis-1, 4-polyisoprene is called
- Neoprene
  - Buna-N
  - Natural rubber
  - Buna-S
19. Which cleansing agent gets precipitated in hard water?
- Sodium stearate
  - Sodium lauryl sulphate
  - Sodium dodecyl benzene sulphonate
  - Cetyl trimethyl ammonium bromide
20. Anti-histamine among the following is
- Morphine
  - Bromopheneramine
  - Chloroxylenol
  - Amoxycillin
21. The elements in which electrons are progressively filled in 4f orbital are called
- Transition elements
  - Actinoids
  - Halogens
  - Lanthanoids
22. Incorrect statement with reference to Ce(Z = 58)
- Ce in +3 oxidation state is more stable than in +4.
  - Ce<sup>4+</sup> is a reducing agent
  - Ce shows common oxidation states of +3 and +4.
  - Atomic size of Ce is more than that of Lu.
23. A mixture of NaCl and K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> is heated with conc. H<sub>2</sub>SO<sub>4</sub>, deep red vapors are formed. Which of the following statement is false?
- The vapours contain CrO<sub>2</sub>Cl<sub>2</sub> only.
  - The vapours give a yellow solution with NaOH.
  - The vapours when passed into lead acetate in acetic acid give a yellow precipitate.
  - The vapours contain CrO<sub>2</sub>Cl<sub>2</sub> and Cl<sub>2</sub>.
24. Which of the following statement is wrong?
- Mn<sup>3+</sup> and Co<sup>3+</sup> are oxidizing agents in aqueous solution.
  - In highest oxidation states, the transition metals show acidic character.
  - All element of 3d series exhibit variable oxidation states.
  - Metals in highest oxidation states are more stable in oxides than in fluorides.
25. Which among the following is the strongest ligand?
- NH<sub>3</sub>
  - CN<sup>-</sup>
  - en
  - CO

# KCET-2019 (Chemistry)



26. Which of the following is a network crystalline solid?  
a. AlN  
b. I<sub>2</sub>  
c. Ice  
d. NaCl
27. The number of atoms in 2.4 g of body centred cubic crystal with edge length 200 pm is (density = 10 g cm<sup>-3</sup>, N<sub>A</sub> = 6 × 10<sup>23</sup> atoms/mol)  
a. 6 × 10<sup>20</sup>  
b. 6 × 10<sup>22</sup>  
c. 6 × 10<sup>19</sup>  
d. 6 × 10<sup>23</sup>
28. 1 mole of NaCl is doped with 10<sup>-5</sup> mole of SrCl<sub>2</sub>. The number of cationic vacancies in the crystal lattice will be  
a. 6.022 × 10<sup>15</sup>  
b. 6.022 × 10<sup>18</sup>  
c. 12.044 × 10<sup>20</sup>  
d. 6.022 × 10<sup>23</sup>
29. A non-volatile solute, 'A' tetramerises in water to the extent of 80%, 2.5g of 'A' in 100g of water, lower the freezing point by 0.3°C. The molar mass of A in mol L<sup>-1</sup> is (K<sub>f</sub> for water = 1.86 K kg mol<sup>-1</sup>)  
a. 221  
b. 62  
c. 354  
d. 155
30. 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 negative  
b. Positive and positive  
c. Negative and positive  
d. Negative and negative
31. The mass of AgCl precipitated when a solution containing 11.70g of NaCl is added to a solution containing 3.4g of AgNO<sub>3</sub> is [Atomic mass of Ag = 108, Atomic mass of Na = 23]  
a. 1.17 g  
b. 5.74 g  
c. 6.8  
d. 2.87 g
32. 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  $\frac{1}{3}$ rd of 'A' is  
a. 2.5 × 10<sup>-8</sup> m  
b. 1.0 × 10<sup>-8</sup> m  
c. 1.0 × 10<sup>-7</sup> m  
d. 1.25 × 10<sup>-7</sup> m
33. The first ionization enthalpy of the following elements are in the order:  
a. P < Si < N < C  
b. C < N < Si < P  
c. Si < P < C < N  
d. P < Si < C < N
34. Solubility of AgCl is least in  
a. Pure water  
b. 0.1 M NaCl  
c. 0.1 M AlCl<sub>3</sub>  
d. 0.1 M BaCl<sub>2</sub>

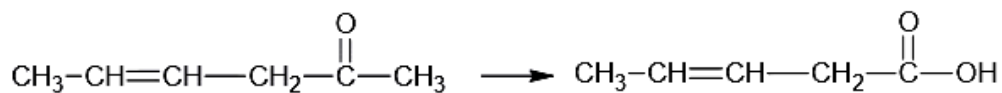
# KCET-2019 (Chemistry)



35. Which of the following equations does NOT represent Charles's law for a given mass of gas at constant pressure?

- a.  $\log V = \log K + \log T$   
b.  $\frac{V}{T} = K$   
c.  $\frac{d(\ln V)}{dT} = \frac{1}{T}$   
d.  $\log K = \log V + \log T$

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



- a.  $\text{I}_2$  and NaOH solution  
b. Tollen's reagent  
c. Sn and NaOH solution  
d. Benzoyl peroxide

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

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

38. If aniline is treated with 1:1 mixture of con.  $\text{HNO}_3$  and con.  $\text{H}_2\text{SO}_4$ , p-nitroaniline and m-nitroaniline are formed nearly in equal amounts. This is due to

- a. Protonation of  $-\text{NH}_2$  which causes deactivation of benzene ring  
b. m-directing property of  $-\text{NH}_2$  group  
c. Isomerisation of some p-nitroaniline into m-nitroaniline  
d. m & p directing property of  $-\text{NH}_2$  group

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

- a. Phosphodiester linkage  
b. Phosphoester linkage  
c. Sulphodiester linkage  
d. Phosphodisulphide linkage

40. Which of the following is generally water insoluble?

- a. Vitamin-C  
b. Fibrous protein  
c. Glycine  
d. Amylose

41. Relative lowering of vapour pressure of a dilute solution of glucose dissolved in 1kg of water is 0.002. The molality of the solution is

- a. 0.222  
b. 0.004  
c. 0.021  
d. 0.111

42. One litre solution of  $\text{MgCl}_2$  is electrolyzed completely by passing a current of 1A for 16 min 5 sec. The original concentration of  $\text{MgCl}_2$  solution was (Atomic mass of Mg = 24)

- a.  $5 \times 10^{-2} \text{ M}$   
b.  $5 \times 10^{-3} \text{ M}$   
c.  $1.0 \times 10^{-2} \text{ M}$   
d.  $0.5 \times 10^{-3} \text{ M}$

43. An aqueous solution of  $\text{CuSO}_4$  is subjected to electrolysis using inert electrodes. The pH of the solution will

- a. Remain unchanged  
b. increase  
c. increase or decrease depending on the strength of the current  
d. decrease

# KCET-2019 (Chemistry)



44. Give:  $E^{\circ}_{\text{Mn}^{+7}/\text{Mn}^{+2}} = 1.5\text{V}$  and  $E^{\circ}_{\text{Mn}^{+4}/\text{Mn}^{+2}} = 1.2\text{V}$ , then  $E^{\circ}_{\text{Mn}^{+7}/\text{Mn}^{+4}}$  is
- 0.1 V
  - 0.3 V
  - 2.1 V
  - 1.7 V
45. 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
- $\text{mol L}^{-1} \text{s}^{-1}$
  - $\text{mol L}^{-1} \text{s}$
  - $\text{s}^{-1}$
  - $\text{L mol}^{-1} \text{s}^{-1}$
46. The metal nitrate that liberates  $\text{NO}_2$  on heating
- $\text{LiNO}_3$
  - $\text{NaNO}_3$
  - $\text{RbNO}_3$
  - $\text{KNO}_3$
47. Which of the following is NOT true regarding the use of hydrogen as a fuel?
- The combustible energy of hydrogen can be directly converted to electrical energy in a fuel cell.
  - High calorific value
  - Hydrogen gas can be easily liquefied and stored.
  - Combustion product is ecofriendly.
48. Resonance effect is not observed in
- $\text{CH}_2=\text{CH}-\text{C}\equiv\text{N}$
  - $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2$
  - $\text{CH}_2=\text{CH}-\text{CH}_2-\text{NH}_2$
  - $\text{CH}_2=\text{CH}-\text{Cl}$
49. 2-butyne is reduced to trans-but-2-ene using
- Na in liq.  $\text{NH}_3$
  - $\text{H}_2 \mid \text{Ni}$
  - Zn in dil. HCl
  - $\text{H}_2 \mid \text{Pd}-\text{C}$
50. Eutrophication causes
- Reduction in water pollution
  - Increase of nutrients in water
  - Decreases BOD
  - Reduction in dissolved oxygen
51. Addition of excess of  $\text{AgNO}_3$  to an aqueous solution of 1 mole of  $\text{PdCl}_2 + 4\text{NH}_3$ , gives 2 moles of  $\text{AgCl}$ . The conductivity of this solution corresponds to-
- 1 : 3 electrolyte
  - 1 : 1 electrolyte
  - 1 : 4 electrolyte
  - 1 : 2 electrolyte

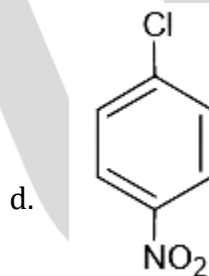
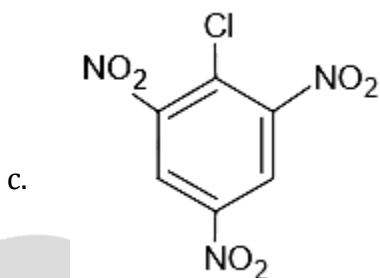
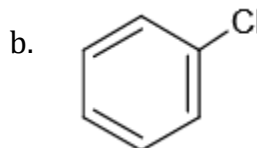
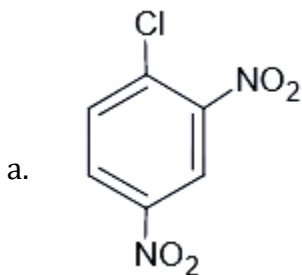
# KCET-2019 (Chemistry)



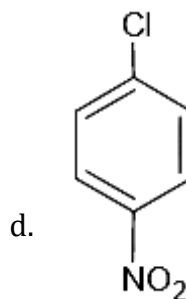
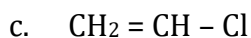
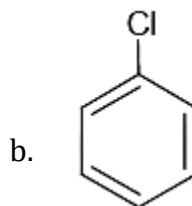
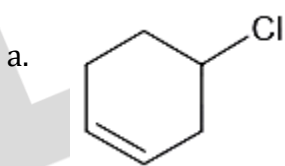
52. The formula of penta aquanitrate chromium (III) nitrate is:

- a.  $[\text{Cr}(\text{H}_2\text{O})_6](\text{NO}_2)_2$                       b.  $[\text{Cr}(\text{H}_2\text{O})_6](\text{NO}_3)_3$   
c.  $[\text{Cr}(\text{H}_2\text{O})_5\text{NO}_2]\text{NO}_3$                       d.  $[\text{Cr}(\text{H}_2\text{O})_5\text{NO}_3](\text{NO}_3)_2$

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


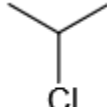



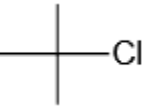
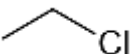
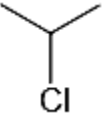



54. The compound having longest C - Cl bond is



# KCET-2019 (Chemistry)

B

55. The alkyl halides required to prepare  by Wurtz reaction are
- a.  and  b.  Cl and  Cl
- c.  Cl and  Cl d.  Cl and  Cl
56. Which is a wrong statement?
- $e^{-E_a/RT}$  gives the fraction of reactant molecules that are activated at the given temp
  - Rate constant  $k =$  Arrhenius constant  $A$  ; if  $E_a = 0$
  - Presence of catalyst will not alter the value of  $E_a$
  - In  $k$  vs  $\frac{1}{T}$  plot is a straight line.
57. 1L of 2M  $\text{CH}_3\text{COOH}$  is mixed with 1L of 3M  $\text{C}_2\text{H}_5\text{OH}$  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
- 2 times
  - 0.25 times
  - 4 times
  - 0.5 times
58. Which of the following is an example of homogeneous catalysis?
- Oxidation of  $\text{SO}_2$  in contact process
  - Oxidation of  $\text{NH}_3$  in Oswald's process
  - Manufacture of  $\text{NH}_3$  by Haber's process
  - Oxidation of  $\text{SO}_2$  in lead chamber process
59. 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  $\text{mol L}^{-1}$  is:
- $4.6 \times 10^{-5}$
  - $2.0 \times 10^{-3}$
  - $1.1 \times 10^{-4}$
  - $7.5 \times 10^{-5}$
60. Oxidation state of copper is +1 in
- Cuprite
  - Malachite
  - Chalcopyrite
  - Azurite



# KCET-2019 (Chemistry)



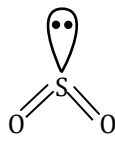
## ANSWER KEYS

1. (b)	2. (a)	3. (a)	4. (b)	5. (c)	6. (b)	7. (c)	8. (d)	9. (b)	10. (d)
11. (c)	12. (b)	13. (d)	14. (d)	15. (d)	16. (c)	17. (a)	18. (c)	19. (a)	20. (b)
21. (d)	22. (b)	23. (d)	24. (c)	25. (d)	26. (a)	27. (b)	28. (b)	29. (b)	30. (c)
31. (d)	32. (c)	33. (c)	34. (c)	35. (d)	36. (a)	37. (a)	38. (a)	39. (a)	40. (b)
41. (d)	42. (b)	43. (d)	44. (d)	45. (c)	46. (a)	47. (c)	48. (c)	49. (a)	50. (b,d)
51. (d)	52. (d)	53. (c)	54. (a)	55. (d)	56. (c)	57. (b)	58. (d)	59. (b)	60. (a)

## Solution

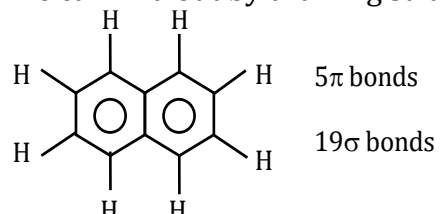
1. (b)

By seeing geometry, we can easily find out the net dipole moment  $\text{BeCl}_2$  &  $\text{CO}_2$  have linear geometry,  $\text{BF}_3$  has triangular planar geometry with zero dipole moment. While  $\text{SO}_2$

geometry is  in bent shape.

2. (a)

We can find out by drawing structure of Naphthalene



5, 19

3. (a)

In the reaction



Here  $\Delta n = +1$

$$\Delta H = \Delta U + \Delta n_g RT$$

So,  $\Delta H > \Delta U$

4. (b)



Here one mole  $\text{Cr}_2\text{O}_7^{2-}$  requires 6 mole of electrons 0.2 mol requires  $\frac{0.2 \times 6}{1} = 1.2$  mole of electrons.

5. (c)

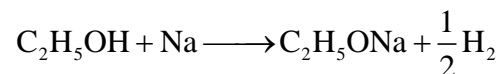
Boric acid is a weak acid it acts as Lewis acid by accepting electrons from  $\text{OH}^-$  ions.

6. (b)

The compound will be more acidic when its conjugate base is more stable. In case of these given compounds, more the electron withdrawing group, present more the compound will be more acidic.

7. (c)

Sodium metal can be used because when sodium metal reacts with ethanol, H<sub>2</sub> gas is evolved.



8. (d)

Reagent A should be such that it reduces aldehyde to alcohol but do not affect double bond. Reagent B should be such that it oxidizes alcohol to aldehyde without affecting double bond. Reagent C should be such that it reduces aldehyde to alcohol and double bond to sigma bond.

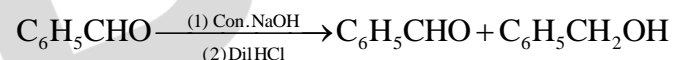
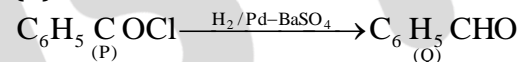
PCC & NaBH<sub>4</sub> does not affect double bond.

9. (b)

Since in question the product is already mentioned. The product formed is chloropropanoic acid

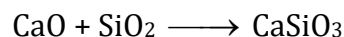
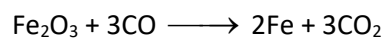
∴ a chlorine atom is also attached to molecule which acts as EWG and increases acidic strength.

10. (d)



11. (c)

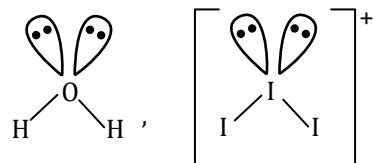
The reactions that occur in blast furnace during extraction of iron are:



12. (b)

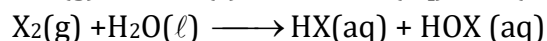
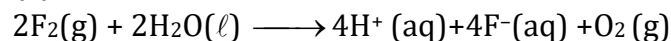
The structures of I<sub>3</sub><sup>+</sup> and H<sub>2</sub>O are:

# KCET-2019 (Chemistry)



They contain 2 lone pair of electrons on central atom.

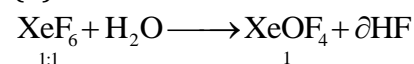
13. (d)



$x = \text{Cl}_2$  or  $\text{Br}_2$

So, by seeing above reactions we can conclude that  $\text{F}_2$  oxidizes  $\text{H}_2\text{O}$  to  $\text{O}_2$  but  $\text{Cl}_2$  does not.

14. (d)



0.1 Mole of  $\text{XeF}_6$  reacts with 0.1 mol of  $\text{H}_2\text{O}$  (1.8 g) to give  $\text{XeOF}_4$ .

15. (d)

Writing equation of reaction of gold with aquaregia



Here, the oxidation state changes from +5 to +2.

16. (c)

Vitamin K helps in clotting of blood. During injuries when blood flow occurs then, vitamin k is responsible for clotting blood and stopping the blood flow from our body.

17. (a)

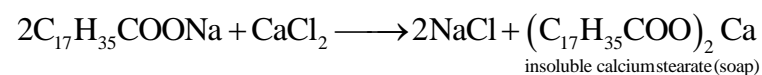
Nylon-6, the monomer has five methyl groups.  $\text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{COOH}$ .

18. (c)

Cis-1,4-polyisoprene, which is also called isoprene rubber, is a major ingredient of natural rubber.

19. (a)

When soap reacts with hard water containing impurities of calcium and magnesium then scum of insoluble calcium stearate is formed.



20. (b)

## KCET-2019 (Chemistry)



Brompheniramine is antihistamine. Antihistamines are drugs which treat allergic rhinitis and other allergies.

21. (d)

In lanthanoid the electrons are filled in 4f orbitals, while in halogens they are filled in p-orbitals and in transition elements, electrons are progressively filled in d-orbitals.

22. (b)

$\text{Cl}^{+4}$  is an oxidizing agent  $\therefore$  it cannot attain oxidation state higher than +4 due to decrease of stability.

23. (d)

The given reaction is of chromyl chloride test  $4\text{Cl}^- + \text{Cr}_2\text{O}_7^{2-}(\text{s}) + 6\text{H}^+(\text{conc.}) \rightarrow 2\text{CrO}_2\text{Cl}_2 + 3\text{H}_2\text{O}$ . When deep red vapours of  $\text{CrO}_2\text{Cl}_2$  are passed into sodium hydroxide solution, a yellow solution of sodium chromate is formed, which when treated with lead acetate gives yellow precipitate of lead chromate



24. (c)

Zinc contains completely filled d-orbitals and exhibit stable electronic configuration therefore, it's does not easily lose their electrons and hence does not exhibit variable valency.

25. (d)

Here CO is the strongest ligand, due to synergic effect of  $\sigma$  &  $\pi$  bond. In this effect some bonds are self-strengthening in nature, when a pi-back donation of electron density occurs from one atomic orbital of one atom to the anti-bonding pi-orbital of another.

26. (a)

In a network solid or covalent network atoms are bonded by covalent bonds in continuous network extending throughout the material. In network solid there are no individual molecules and the entire crystal considered as macromolecules.

27. (b)

Using formula  $d = \frac{zm}{a^3 N_A}$

# KCET-2019 (Chemistry)



$$m = \frac{d \times a^3 \times N_A}{z} = \frac{10 \times (200)^3 \times 10^{-30} \times 6 \times 10^{23}}{2} = 2u$$

24g contains  $6 \times 10^{23}$

2.4 g will contain  $6 \times 10^{22}$

28. (b)

1 mole  $\text{SrCl}_2$  gives 1 cationic vacancy  $10^{-5}$  moles of  $\text{SrCl}_2$  gives  $10^{-5}$  mole cationic vacancy.

$\therefore$  Number of cationic vacancies in 1 mole of NaCl. When it is doped with  $10^{-5}$  moles of  $\text{SrCl}_2$  is  $6.022 \times 10^{18}$ .

29. (b)

For applying formula of  $\Delta T_f$  we have to find  $\alpha$ ,

$$\alpha = \frac{80}{100} = 0.8$$

$$\alpha = \frac{1-i}{1-\frac{1}{n}} \Rightarrow \alpha = \frac{1-i}{1-\frac{1}{4}}; = \frac{1-i}{\frac{3}{4}}$$

$$i = 0.4$$

$$\Delta T_f = 0.3$$

$$0.3 = \frac{i \times K_f \times w_2 \times 1000}{m_2 \times 100}$$

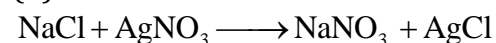
$$m_2 = \frac{0.4 \times 1.86 \times 2.5 \times 10}{0.3}$$

$$m_2 = 62 \text{ g/mol.}$$

30. (c)

Acetone-carbon disulphide solution shows positive deviation from Raoult's law. The observed vapor pressure of each component and total, vapor pressure is greater than predicted by Raoult's law. Acetone + Chloroform give negative deviation.

31. (d)



$$58.5\text{g} \quad 170 \quad \quad \quad 143.5\text{g}$$

(Limiting reagent)

## KCET-2019 (Chemistry)



NaCl: AgNO<sub>3</sub>

Required ratio 58.5: 170

Given ratio 11.70: 3.4 (Limiting reagent)

170g AgNO<sub>3</sub> → 143.5 (g) AgCl

∴ 3.4g AgNO<sub>3</sub> → x

$$x = \frac{3.4 \times 143.5}{170} = 2.879$$

32. (c)

By de Broglie equation  $\lambda_A = \frac{h}{P_A}$  and  $\lambda = \frac{h}{P_B}$

$$\frac{\lambda_A}{\lambda_B} = \frac{P_B}{P_A}$$

But  $P_B = \frac{1}{2}P_A$  (Given)

$$\therefore \frac{\lambda_A}{\lambda_B} = \frac{\frac{1}{2}P_A}{P_A} = \frac{1}{2}; \lambda_B = 2 \times \lambda_A$$

$$\lambda_B = 2 \times 5 \times 10^{-8} \text{ m}$$

$$= 10^{-7} \text{ m}$$

33. (c)

∴ As we move from left to right in periodic table, the ionization energy increases and as we move down the table ionization energy decreases as number of shells increases, hence z-effective decreases.

34. (c)

Solubility of AgCl is least in 0.1 M AlCl<sub>3</sub> due to common ion effect.

35. (d)

Charles law:  $\frac{V}{T} = K$

If we take log on both sides then

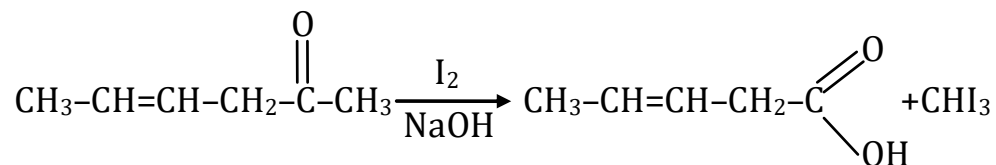
$$\log v - \log T = \log K.$$

# KCET-2019 (Chemistry)

B

36. (a)

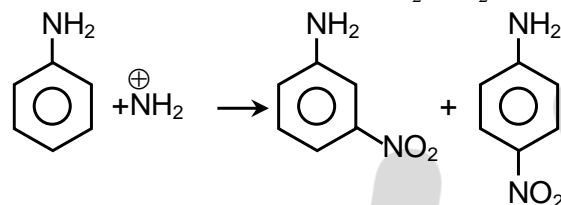
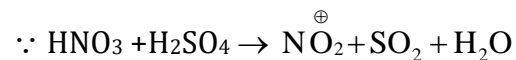
$I_2/NaOH$  since the byproduct formed is in gaseous state and hence can be easily separated.



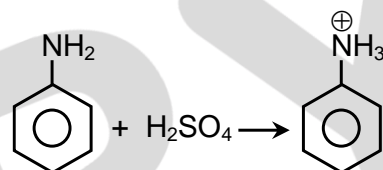
37. (a)

$(CH_3)_3N$  shows no H-Bonding hence it is least soluble.

38. (a)



In presence of acid, aniline gets protonated to anilinium ion which is meta directing.



39. (a)

Nucleic acids and nucleotides are joined by phosphodiester linkage.

A nucleotide has three components nitrogenous base, a pentose sugar; ribose in case of RNA and deoxyribose in case of DNA. A nitrogenous base is linked to the pentose sugar through a N-glycosidic linkage to form a nucleoside. The nucleotides are linked through 3-5 phosphodiester linkage to form dinucleotide.

40. (b)

Vitamin A, D, E, K are water insoluble vitamins. While B, C are water soluble vitamins

41. (d)

$$\frac{P^0 - P}{P^0} = \frac{w_2}{m_2} \times \frac{m_1}{w_1}$$

$$0.002 = \frac{w_2}{m_2} \times \frac{18}{1000}$$



$$\frac{w_2}{m_2} = 0.11 \text{ mole}$$

$$\text{molality} = \frac{w_2}{m_2} \times \frac{1000}{w_1} = 0.11 \times \frac{1000}{1000} = 0.11 \text{ m}$$

42. (b)

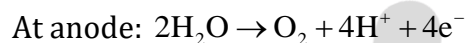
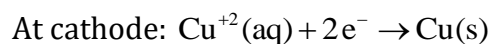
$$m = \frac{EIZ}{96500} = \frac{12 \times 1 \times 965}{96500} = 12 \times 10^{-2} \text{ g}$$

$$\text{Molarity} = M = \frac{w_2}{m_2} \times \frac{1000}{vm_1} = \frac{12 \times 10^{-2}}{24} \times \frac{1000}{1000}$$

$$= 0.5 \times 10^{-2} = 5 \times 10^{-3} \text{ m}$$

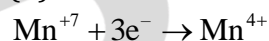
43. (d)

We can find the answer by writing equations of electrolysis of  $\text{CuSO}_4$ .

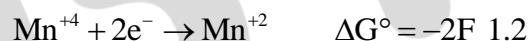


Production of  $\text{H}^{+}$  ions will decrease  $\text{pH}$ .

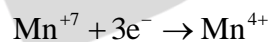
44. (d)



$$\Delta G^{\circ} = -nFE^{\circ} \quad \Delta G^{\circ} = -5F \ 1.5$$



Required equation

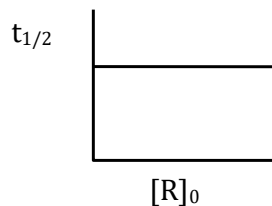


$$\therefore -3FE^{\circ} = -7.5F + 2.4F$$

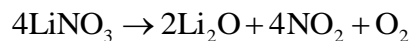
$$E^{\circ} = 1.7 \text{ V.}$$

45. (c)

$\therefore t_{1/2}$  is independent of initial concentration of the reactant and is first order reaction.



46. (a)



$\text{LiNO}_3$  is metal nitrate that liberate  $\text{NO}_2$  on heating.

47. (c)

The critical temperature of hydrogen is low hence, cannot be easily liquefied. Its combustion is ecofriendly, it does not liberate harmful gases on combustion. It has high calorific value.

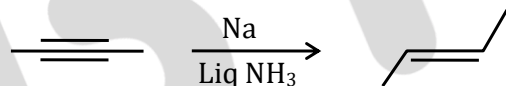
48. (c)

$\therefore$  For lone pair nitrogen atom no conjugations of  $\text{Pi}$  electrons are present hence will not show resonance.

49. (a)

2-butyne can be reduced to transbut-2-ene using Na in liq  $\text{NH}_3$ .

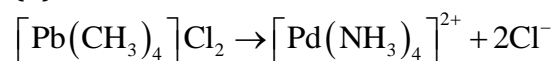
This reaction is called Birch reduction.



50. (b,d)

Eutrophication refers to excessive increase in minerals and nutrients in aquatic system, resulting in excess of algae growth and reduction in dissolved oxygen.

51. (d)



It is 1:2 i.e.  $\text{AB}_2$  type of electrolyte.

52. (d)

Formula of penta aquanitrato chromium III nitrate is  $[\text{Cr}(\text{H}_2\text{O})_5(\text{NO}_3)](\text{NO}_3)_2$ .

The prefix penta indicates the presence of 5  $\text{H}_2\text{O}$  ligands. The names of ligands are written in alphabetical order.

# KCET-2019 (Chemistry)

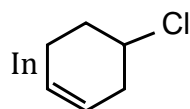


Oxidation state of chromium is written in roman numbers in parenthesis.

53. (c)

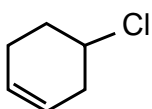
As number of EWG at ortho and para position increases, reactivity towards nucleophilic substitution reaction increases.

54. (a)

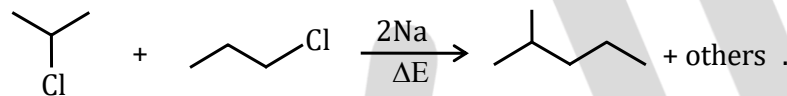


this compound the lone pairs of chlorine atom are not in resonance while in

remaining structures, lone pairs are in resonance. Hence, C-Cl bond have double bond

characters. While in  this structure bond is purely sp<sup>3</sup> hybridized.

55. (d)

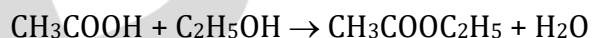


56. (c)

Lnk v/s  $\frac{1}{T}$  graph is a straight line graph but presence of catalyst will alter the value of Ea.

57. (b)

For finding rate of reaction we have to write the equation of esterification



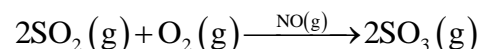
$$r = k [\text{CH}_3\text{COOH}][\text{C}_2\text{H}_5\text{OH}]$$

Order = 2

When equal volumes of two solutions are mixed, concentration of the solutions reduces to half of the initial value. Hence, rate of reaction gets reduced to  $\frac{1}{4}$  of initial rate.

58. (d)

When both reactants and catalysts are in the same phase, then the catalysis is homogeneous.



59. (b)

## KCET-2019 (Chemistry)



Micelles are associated with colloids when the temperature increases above Kraft temperature then particles get associated with each other and get into colloidal range called 'micelle'. For formation of micelles, concentration of soap should exceed CMC value.

60. (a)

In  $\text{Cu}_2\text{O}$  cuprite oxidation state of Cu is +1.

$\text{Cu}_2\text{O}$  let oxidation state of Cu is x

$$2x + (-2) = 0$$

$$2x = 2; x = 2/2 \Rightarrow x = +1$$