KCET Board Exam – 2022

Subject: Chemistry **CODE: _____**

1. The correct IUPAC name of cis- platin is

   (A) dichloride diammine platinum (B) diammine dichloride platinum (II)

   (C) diammine dichloride platinum (IV) (D) diammine dichloride platinum (0)

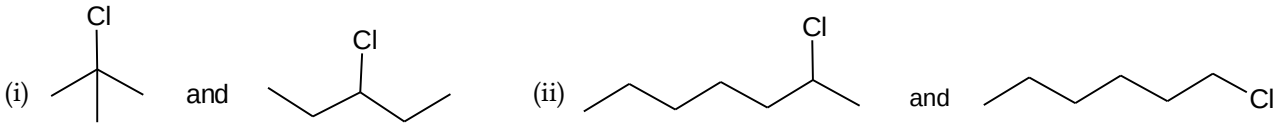
2. Crystal Field Splitting Energy (CFSE) for $[CoCl_6]^{4-}$ is $18000\,cm^{-1}$. The Crystal Field splitting Energy (CFSE) for $[CoCl_4]^{2-}$ will be

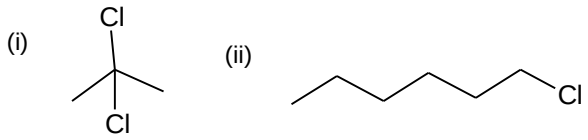
   (A) $10,000\,cm^{-1}$ (B) $18000\,cm^{-1}$ (C) $16000\,cm^{-1}$ (D) $8000\,cm^{-1}$

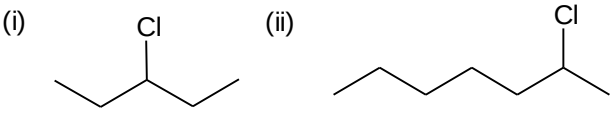
3. The complex hexammineplatinum (IV) chloride will give _____ number of ions on ionization.

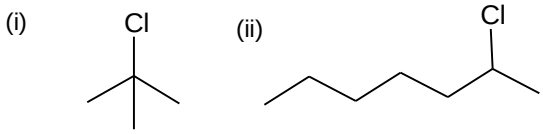
   (A) 2 (B) 5 (C) 4 (D) 3

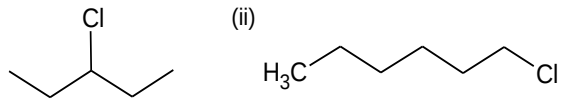
4. In the following pairs of halogen compounds, which compound undergoes faster S_N1 reaction?



(A) 

(B) 

(C) 

(D) 

5. The only Lanthanoid which is radioactive

   (A) Praseodymium (B) Lanthanum (C) Cerium (D) Promethium

6. All $Cu(II)$ halides are known, except the iodide, the reason for it is that

   (A) Cu^{+2} ion has smaller size

   (B) Iodide is bulky ion

   (C) Cu^{+2} oxidises iodide to iodine

   (D) Cu^{+2} has much more negative hydration enthalpy

7. An organic compound with molecular formula C_7H_8O dissolves in $NaOH$ and gives a characteristic colour with $FeCl_3$. On treatment with bromine, it gives a tribromo derivative $C_7H_5OBr_3$. The compound is

(A) p- Cresol (B) Benzyl alcohol (C) o- Cresol (D) m- Cresol

8. In Kolbes reaction the reacting substances are

(A) Phenol and $CHCl_3$ (B) Sodium phenate and CO_2

(C) Phenol and CCl_4 (d) Sodium phenate and CCl.

9. The major product obtained when ethanol is heated with excess of conc. H_2SO_4 at 443K is

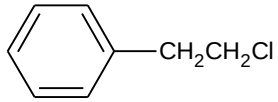
(A) methane (B) ethene (C) ethyne (D) ethane

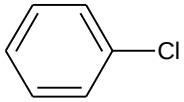
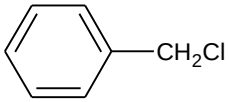
10. Among the following, the products formed by the reaction of anisole with HI are:

(A) Phenol + Methane (B) Phenol + Iodomethane

(C) Sodium phenate + Methanol (D) Benzene + Methanol

11. Which one of the following Chlorohydrocarbon readily undergoes solvolysis?

(A)  (B) $CH_2 = CHCl$

(C)  (D) 

12. Identify the products A and B in the reactions:

$R - X + AgCN \rightarrow A + AgX$

$R - X + KCN \rightarrow B + KX$

(A) $A = RNC; B = RNC$ (B) $A = R - CN; B = RCN$

(C) $A = RCN; B = RCN$ (D) $A = RNC; B = RCN$

13. Reaction by which benzaldehyde cannot be prepared is

(A) Benzoyl chloride $+H_2 \xrightarrow[\Delta]{N-BaSO_4}$ (B) Benzene $+CO + HCl \xrightarrow{\text{anhydrous}AlCl_3}$

(C) Benzoic acid $\xrightarrow{Zn-Hg \text{ and } con.HCl}$ (D) Toluene $\xrightarrow[(ii)\quad H_3O^+]{(i)\quad CrO_2Cl_2 \text{ in } CS_2}$

14. The test to differentiate between pentan –2– one and pentan –1– one is

(A) Iodoform test (B) Baeyer's test (C) Benedict's test (D) Fehling's test

15. In Carbyl;amine test for primary amines the resulting foul smelling product is

(A) $COCl_2$ (B) CH_3NCl_2 (C) CH_3CN (D) CH_3NC

16. Ethanoic acid undergoes Hell-Volhard Zelinsky reaction but Methanoic acid does not, because of

(A) higher acidic strength of ethanoic acid than methanoic acid

(B) presence of $\alpha - H$ atom in ethanoic acid

(C) presence of $\alpha - H$ atom in ethanoic acid

(D) absence of $\alpha - H$ atom in ethanoic acid

17. The general name of the compound formed by the reaction between aldehyde and alcohol is

(A) Acetate (B) Ester (C) Acetal (D) Glycol

18. Which institute has approved the emergency use of 2-deoxy-D-Glucose as additive therapy for COVID – 19 patients?

(A) Drug Controller General of India (B) Indian Council of Medical Research

(C) World Health Organisation (D) Ministry of Health and Family Welfare

19. A Nucleic acid, whether DNA or RNA gives on complete hydrolysis, two purine bases, two pyrimidine bases, a pentose sugar and phosphoric acid. Nucleotides which are intermediate products in the hydrolysis contain

(A) Purine or pyrimidine base, a pentose sugar and ortho-phosphoric acid

(B) purine or pyrimidine base and pentose sugar.

(C) a purine base, pentose sugar and ortho-phosphoric acid

(D) purine or pyrimidine base and ortho-phosphoric acid

20. A secondary amine is

(A) a compound in which 2 of the hydrogen of NH_3 have been replaced by organic groups

(B) an organic compound with two NH_2 group

(C) a compound with two carbon atom and an NH_2 group

(D) a compound with an NH_2 group on the carbon atom in number 2 position

21. Which of the following is correctly matched?

(A) Polyster – tetrafluoroethene (B) Nylon – acrylonitrile

(C) Teflon – copralactum (D) Bakelite - Novolac

22. Elements X, Y and Z have atomic numbers $19, 37$ and 55 respectively. Which of the following statements is true about them?

(A) Y would have the highest ionization potential

(B) Their ionisation potential would increase with increasing atomic number.

(C) Y would have an ionisation potential between those of X and Z.

(D) Z would have the highest ionisation potential.

23. In oxygen and carbon molecule the bonding is

(A) $O_2 : 0\sigma, 2\pi; C_2 : 2\sigma, 0\pi$ (B) $O_2 : 1\sigma, 1\pi; C_2 : 1\sigma, 1\pi$

(C) $O_2 : 2\sigma, 0\pi; C_2 : 0\sigma, 2\pi$ (D) $O_2 : 1\sigma, 1\pi; C_2 : 0\sigma, 2\pi$

24. Which is most VISCOUS?

(A) Glycerol (B) Methanol (C) Ethanol (D) Ethylene glycol

25. The volume of $2.8\ g$ of CO at $27\ ^\circ C$ and 0.821 atm . pressure is $\left(R = 0.08210 \text{ lit.atm.} K^{-1} mol^{-1}\right)$

(A) 30 litres (B) 0.3 litres (C) 1.5 litres (D) 3 litres

26. The work done when 2 moles of an ideal gas expands reversibly and isothermally from a volume of $1L$ to $10L$ at $300\ K$ is $\left(R = 0.0083 kJ\ K\ mol^{-1}\right)$

(A) $58.5\ kJ$ (B) $11.5 kJ$ (C) $5.8\ kJ$ (D) $0.115\ kJ$

27. An aqueous solution of alcohol contains 18 g of water and 414 g of ethyl alcohol. The mole fraction of water is

(A) 0.9 (B) 0.1 (C) 0.4 (D) 0.7

28. If wavelength of photon is $2.2\times10^{-11}\,m$ and $h = 6.6\times10^{-34}\,J\ s$, then momentum of photon

(A) $6.89\times10^{+43}kg\ ms^{-1}$ (B) $3\times10^{-23}kg\ ms^{-1}$

(C) $3.33\times10^{-22}kg\ ms^{-1}$ (D) $1.452\times10^{-44}kg\ ms^{-1}$

29. In which of the following compounds, an element exhibits two different oxidation states?

(A) N_3H (B) NH_2CONH_2 (C) NH_4NO_3 (D) N_2H_4

30. Which of the following hydrides is electron deficient?

(A) B_2H_6 (B) NaH (C) CaH_2 (D) CH_4

31. Amphoteric oxide among the following

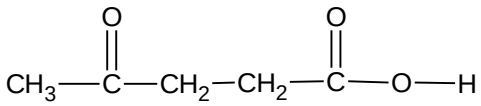
(A) SnO_2 (B) BeO (C) CO_2 (D) Ag_2O

32. Which property of CO_2 makes it biologically and geo-chemically important?

(A) Its high compressibility (B) Its acidic nature

(C) Its colourless and odourless nature (D) Its low solubility in water

33. The IUPAC name for



(A) 4 – oxopentanoic acid (B) 1 – hydroxy pentance –1, 4 – dione

(C) 1,4 – dioxopentanol (D) 1 – carboxybutan –3 – one

34. 1 mole of HI is heated in a closed container of capacity of 2L. At equilibrium half a mole of HI is dissociated. The equilibrium constant of the reaction is

(A) 0.35 (B) 1 (C) 0.5 (D) 0.25

35. Which among the following has higest pH?

(A) 0.1 M $NaOH$ (B) 1 M HCI (C) 1 M $NaOH$ (D) 1 M H_2SO_4

36. How many number of atoms are there in a cube based unit cell, having one atom on each corner and 2 atom on each body diagonal of cube?

(A) 9 (B) 8 (C) 6 (D) 4

37. Which of the following is <u>NOT</u> true about the amorphous solids?

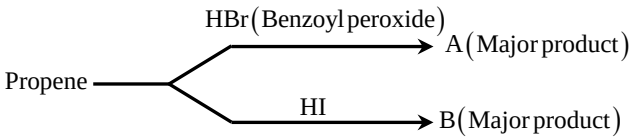
(A) They are anisotropic nature.

(B) On heating they may become crystalline at certain temperature.

(C) They may become crystalline on keeping for long time.

(D) Amorphous solids can be moulded by heating.

38. Identify A and B in the reaction



(A) $A: CH_3-\underset{\underset{Br}{|}}{CH}-CH_3$; $B: CH_3-\underset{\underset{I}{|}}{CH}-CH_3$ (B) $A: CH_3-CH_2-CH_2-Br$; $B: CH_3-CH_2-CH_2-I$

(C) $A: CH_3-CH_2-CH_2-Br$; $B: CH_3-\underset{\underset{I}{|}}{CH}-CH_3$ (D) $A: CH_3-\underset{\underset{Br}{|}}{CH}-CH_3$; $B: CH_3-CH_2-CH_2-I$

39. Vacant space in body centered cubic lattice unit cell is about

(A) 46% (B) 32% (C) 10% (D) 23%

40. The rise in boiling point of a solution containing $1.8g$ of glucose in $100\ g$ of solvent is $0.1\,°C$. The molal elevation constant of the liquid is

(A) $10\ K\ kg\ /\ mol$ (B) $0.1K\ kg\ /\ mol$ (C) $1\ K\ kg\ /\ mol$ (D) $2\ K\ kg\ /\ mol$

41. If $3\ g$ of glucose (molar mass $=180\ g$) is dissolved in $60\ g$ of water at $15\,°C$, the osmotic pressure of the solution will be

(A) 5.57 *atm* (B) 0.34 *atm* (C) 0.65 *atm* (D) 6.57 *atm*

42. Which of the following colligative properties can provide molar mass of proteins, polymers and colloids with greater precision?

(A) Osmotic pressure (B) Relative lowering of vapour pressure

(C) Elevation in boiling point (D) Depression in freezing point

43. In Fuel cells _____ are used as catalysts

(A) Lead - Manganese (B) Platinum – Palladium

(C) Nickel – Cadmium (D) Zinc - Mercury

44. The molar conductivity is maximum for the solution of concentration

(A) $0.001\ M$ (B) $0.004\ M$ (C) $0.002\ M$ (D) $0.005\ M$

45. Alkali haildes <u>do not</u> show dislocation defect because

(A) There is large difference in size of cation and anions.

(B) Cations and anions have low co-ordination number.

(C) Anions cannot be accommodated in vacant spaces.

(D) Cations and anions have almost equal size.

46. Solubility of a gas in a liquid increases with

(A) decrease of P and decrease of T (B) increase of P and increase of T

(C) decrease of P and increase of T (D) increase of P and decrease of T

47. For n^{th} order of reaction, Half-life period is directly proportional to

(A) a^{1-n} (B) $\frac{1}{a^{n-1}}$ (C) $\frac{1}{a^{1-n}}$ (D) a^{n-1}

48. half-life of a reaction is found to be inversely proportional to the fifth power of its initial concentration, the order of reaction is

(A) 6 (B) 3 (C) 4 (D) 5

49. A first order reaction is half completed in 45 min. How long does it need 99.9% of the reaction to be completed?

(A) 20 Hours (B) 5 Hours (C) 7.5 Hours (D) 10 Hours

50. The rate of the reaction:

$CH_3COOC_2H_5+NaOH \rightarrow CH_3COONa+C_2H_5OH$ is given by the equation,

Rate $=K$ $=K[CH_3COOC_2H_5][NaOH]$. If concentration is expressed in $\text{mol}L^{-1}$, the unit of K is

(A) s^{-1} (B) $\text{mol}^{-2}L^2s^{-1}$ (C) $\text{mol}\,L^{-1}s^{-1}$ (D) $L\,\text{mol}^{-1}s^{-1}$

51. Colloidal solution commonly used in the treatment of skin disease is

(A) Colloidal Antimony (B) Colloidal Sulphur

(C) Colloidal Silver (D) Colloidal Gold

52. Specific conductance of $0.1\,M$ HNO_3 is 6.3×10^{-2} $\text{ohm}^{-1}\,\text{cm}^{-1}$. The molar conductance the solution is

(A) $63.0\ \text{ohm}^{-1}\text{cm}^2\ \text{mol}^{-1}$ (B) $630\ \text{ohm}^{-1}\ \text{cm}^2\,\text{mol}^{-1}$

(C) $315\text{ohm}^{-1}\text{cm}^2\ \text{mol}^{-1}$ (D) $6.300\ \text{ohm}^{-1}\text{cm}^2\ \text{mol}^{-1}$

53. For spontaneity of a cell, which is correct?

(A) $\Delta G=-ve$ (B) $\Delta G=0,\Delta E=0$ (C) $\Delta G=-ve,\Delta E=0$ (D) $\Delta G=+ve,\ \Delta E=+ve$

54. Which noble gas has least tendency to form compounds?

(A) Kr (B) He (C) Ne (D) Ar

55. $(NH_4)_2Cr_2O_7$ on heating liberates a gas. The same gas will be obtained by

(A) treating Mg_3N_2 with H_2O (B) hearing NH_4NO_3

(C) heating NH_4NO_2 (D) treating H_2O_2 with $NaNO_2$

56. The strong reducing property of hypophosphorous acid is due to

(A) presence of phosphorus in its highest oxidation state

(B) its concentration

(C) the positive valence of phosphorus

(D) two $P-H$ bonds

57. A transition metal exists in its highest oxidation state. It is expected to behave as

(A) a reducing agent

(B) a chelating agent

(C) a central metal in a co-ordination compound

(D) an oxidation agent

58. What will be the value of x in Fe^{x+}, if the magnetic moment $\mu=\sqrt{24}\ BM$?

(A) +1 (B) +2 (C) +3 (D) 0

59. Which can absorb larger volume of hydrogen gas?

(A) Colloidal $Fe(OH)_3$ (B) Finely divided nickel

(C) Colloidal solution of palladium (D) Finely divided platinum

60. The property of halogens which is not correctly matched is

(A) $F > Cl > Br > I$ (electron gain enthalpy) (B) $F > Cl > Br > I$ (ionization enthalpy)

(C) $F > Cl > Br > I$ (electronegativity) (D) $I > Br > Cl > F$ (density)