

KCET – CHEMISTRY – 2017

1. Select wrong chemical reaction among the following:

- A) $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + 2\text{H}_2\text{O}$
- B) $8\text{NH}_3 + 3\text{Cl}_2 \rightarrow 6\text{NH}_4\text{Cl} + \text{N}_2$
- C) $2\text{Ca(OH)}_2 + 2\text{Cl}_2 \rightarrow \text{Ca(OCl)}_2 + \text{CaCl}_2 + 2\text{H}_2\text{O}$
- D) $2\text{NaOH} + \text{Cl}_2 \rightarrow 2\text{NaCl} + \text{H}_2 + \text{O}_2$

Ans: (D)

2. The co-ordination number and the oxidation state of the element 'M' in the complex $[\text{M(en)}_2(\text{C}_2\text{O}_4)]\text{NO}_2$ {where (en) is ethan-1, 2 – diamine} are respectively

- A) 6 and 3
- B) 6 and 2
- C) 4 and 3
- D) 4 and 2

Ans: (A)

3. In which of the following, homolytic bond fission takes places?

- A) Alkaline hydrolysis of ethyl chloride
- B) Nitration of Benzene
- C) Addition of HBr to double bond
- D) Free radical chlorination of methane

Ans: (D)

4. Identify the correct statement in the following:

- A) Propan – 1 – ol and propan –2-ol are position isomers
- B) Ethanoic acid and methyl methanoate are position isomers
- C) n-butane and isobutene are functional isomers
- D) Dimethyl ether and ethanol are chain isomers

Ans: (A)

5. Which of the following is not a biodegradable polymer?

- A) Glyptol
- B) Polyhydroxy butyrate – CO- β hydroxyl valerate
- C) Phbv
- D) Nylon-2-β hydroxyl

Ans: (A)

6. $3\text{ClO}^-_{(\text{aq})} \rightarrow \text{ClO}^- + 2\text{Cl}^-$ is an example of

- A) Oxidation reaction
- B) Reduction reaction
- C) Disproportionation reaction
- D) Decomposition reaction

Ans: (B)

7. Extraction of chlorine from brine solution is based on

- A) Acidification
- B) Oxidation
- C) Reduction
- D) Chlorination

Ans: (B)

8. Which of the following is not a favourable condition for physical adsorption?

- A) Higher critical temperature of adsorbate
- B) Low temperature
- C) High pressure
- D) High temperature

Ans: (D)

9. The process which is responsible for the formation of delta at a place where rivers meet the sea is

- A) Colloid formation
- B) Peptization
- C) Emulsification
- D) Coagulation

Ans: (D)

10. A reaction has both ΔH and ΔS -ve. The rate of reaction
- Increases with increase in temperature
 - Cannot be predicated for change in temperature
 - Increases with decrease in temperature
 - Remains unaffected by change temperature

Ans: (A)

11. Plaster of Paris is represented as

- A) $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ B) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$ C) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ D) CaSO_4

Ans: (A)

12. Which of the following structure of a molecule is expected to have three bond pairs and one lone pair of electrons?

- A) Octahedral B) Trigonal Planar C) Pyramidal D) Tetrahedral

Ans: (C)

13. In the electrolysis of aqueous sodium chloride solution, which of the half cell reaction will occur at anode?

- | | |
|--|--|
| A) $\text{H}_{(\text{aq})}^+ + \text{e}^- \rightarrow \frac{1}{2} \text{H}_2$
$E_{\text{cell}}^{\circ} = 0.00 \text{ volts}$ | B) $\text{Na}_{(\text{aq})}^+ + \text{e}^- \rightarrow \text{Na}_{(\text{s})}$
$E^{\circ} = 2.71 \text{ volts}$ |
| C) $\text{Cl}_{(\text{aq})}^- + \text{e}^- \rightarrow \frac{1}{2} \text{Cl}_2 + \text{e}^-$
$E_{\text{cell}}^{\circ} = 1.36 \text{ volts}$ | D) $2\text{H}_2\text{O}^{(\text{l})} \rightarrow \text{O}^2 + 4\text{H}^+ + 4\text{e}^-$
$E_{\text{cell}}^{\circ} = 1.23 \text{ volts}$ |

Ans: (C)

14. Cannizzaro's reaction is an example of auto oxidation

- It is a typical reaction of aliphatic aldehyde.
- It is a reaction answered by all aldehyde
- It is a reaction answered by only aldehydes containing α - hydrogen.
- It is a reaction answered only by aromatic aldehydes.

Ans: (D)

15. The Glycosidic linkage present in sucrose is between

- C - 1 of α - glucose and C - 2 of β - fructose
- C - 1 of β - galactose and C - 4 of α - glucose
- C - 1 of α - glucose and C - 4 of β - fructose
- C - 1 of α - glucose and C - 4 of α - glucose

Ans: (A)

16. If 3.01×10^{20} molecules are removed from 98 mg of H_2SO_4 , then number of moles of H_2SO_4 left are

- A) $1.66 \times 10^{-3} \text{ mol}$ B) $0.1 \times 10^{-3} \text{ mol}$ C) $9.95 \times 10^{-2} \text{ mol}$ D) $0.5 \times 10^{-3} \text{ mol}$

Ans: (D)

17. The Vant Hoff's factor 'i' accounts for

- Extent of dissolution of solute
- Extent of mobility of solute
- Extent of solubility of solute
- Extent of dissociation of solute

Ans: (D)

18. The correct set of quantum number for the unpaired electrons of chlorine atom is

- A) 3, 1, 1, $\pm \frac{1}{2}$ B) 2, 1, -1, $+\frac{1}{2}$ C) 3, 0, 0, $\pm \frac{1}{2}$ D) 2, 0, 0, $+\frac{1}{2}$

Ans: (A)

19. The pressure of real gases is less than that of ideal gas because of
- A) Finite size of particles
 B) Increase in the kinetic energy of the molecule
 C) Intermolecular attraction
 D) Increase in the number of collisions

Ans: (C)

20. Which of the following reagent cannot be used to oxidize primary alcohols to aldehydes?
- A) Pyridinium chloro chromate
 B) Heating in presence of Cu at 573 K
 C) KMnO_4 in acidic medium
 D) CrO_3 in anhydrous medium

Ans: (C)

21. Square planar complex of the type M_{AXBL} (where A, B, X and L are unidentate ligands) shows following set of isomers

- A) Two cis and one trans
 B) Two trans and one cis
 C) Two cis and two trans
 D) Three cis and one trans

Ans: (A)

22. Which of the following crystal has unit cell such that $a \neq b \neq c$ and $\alpha \neq \beta \neq \gamma \neq 90^\circ$?

- A) KNO_3
 B) K_2SO_4
 C) $\text{K}_2\text{Cr}_2\text{O}_7$
 D) NaNO_3

Ans: (C)

23. Which of the following element forms $p_\pi - p_\pi$ bond with itself?

- A) Se
 B) Te
 C) N
 D) P

Ans: (C)

24. According to crystal field theory, the M - L bond in a complex is

- A) partially covalent
 B) purely ionic
 C) purely co-ordinate
 D) purely covalent

Ans: (B)

25. Which of the following aqueous solution has highest freezing point?

- A) 0.1 molal $\text{Al}_2(\text{SO}_4)_3$
 B) 0.1 molal BaCl_2
 C) 0.1 molal AlCl_3
 D) 0.1 molal NH_4Cl

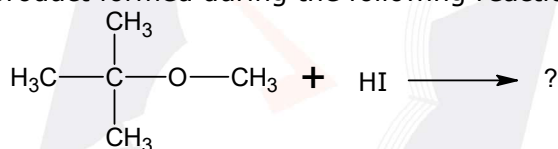
Ans: (D)

26. The correct order of increasing basic nature for the bases NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$ in aqueous solutions

- A) $\text{NH}_3 < \text{CH}_3\text{NH}_2 < (\text{CH}_3)_2\text{NH}$
 B) $\text{CH}_3\text{NH}_2 < \text{NH}_3 < (\text{CH}_3)_2\text{NH}$
 C) $\text{CH}_3\text{NH}_2 < (\text{CH}_3)_2\text{NH} < \text{NH}_3$
 D) $(\text{CH}_3)_2\text{NH} < \text{NH}_3 < \text{CH}_3\text{NH}_2$

Ans: (A)

27. The product formed during the following reaction are



- A) $\text{CH}_4 + \begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{OI} \\ | \\ \text{CH}_3 \end{array}$
 B) $\text{CH}_3\text{I} + \begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{OH} \\ | \\ \text{CH}_3 \end{array}$
 C) $\text{CH}_3\text{OH} + \begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{I} \\ | \\ \text{CH}_3 \end{array}$
 D) $\text{CH}_3\text{OI} + \begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{H} \\ | \\ \text{CH}_3 \end{array}$

Ans: (C)

28. Pick the correct statement among the following:

- A) Sodium lauryl sulphate forms an insoluble scum with hard water.
- B) Sodium dodecyl benzene sulphonate used in tooth paste is a cationic detergent.
- C) Cetyl trimethyl ammonium bromide is a popular cationic detergent used in air conditioner
- D) Non-ionic detergents is formed when polyethylene glycol reacts with adipic acid

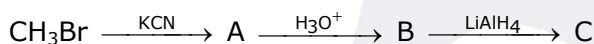
Ans: (A)

29. Which one of the following metallic oxide exhibit amphoteric nature?

- A) CaO
- B) Na₂O
- C) BaO
- D) Al₂O₃

Ans: (D)

30. In the following sequence of reactions

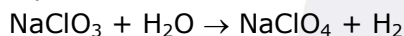


The end product C is

- A) Ethyl Alcohol
- B) Acetaldehyde
- C) Acetone
- D) Methane

Ans: (A)

31. By passing electric current, NaClO₃ is converted into NaClO₄ according to the following equation



How many moles of NaClO₄ will be formed when three Faradays of charge is passed through NaClO₃?

- A) 1.5
- B) 1.0
- C) 3.0
- D) 0.75

Ans: (A)

32. Which of the following statement is wrong regarding Lanthanoids?

- A) The ionic size of Ln (III) ions decreases with increasing atomic number.
- B) Ln (III) hydroxides are mainly basic in nature
- C) Ln (III) compounds are predominantly ionic in character
- D) Ln (III) compounds are generally colourless

Ans: (D)

33. Which one of the following is not a common component of photo-chemical smog?

- A) Ozone
- B) Acrolein
- C) Peroxy acetyl nitrate
- D) Chloro fluoro carbons

Ans: (A)

34. Which one of the following noble gas has an unusual property of diffusing through the materials such as rubber, glass or plastic?

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

Ans: (A)

35. When the pure solvent diffuses out of the solution through the semi-permeable membrane then the process is called

- A) Reverse osmosis
- B) Dialysis
- C) Osmosis
- D) Sorption

Ans: (A)

36. For a reaction $\frac{1}{2}A \rightarrow 2B$ rate of disappearance of A is related to rate of appearance of B by the expression

- A) $\frac{-d[A]}{dt} = \frac{d[B]}{dt}$
- B) $\frac{-d[A]}{dt} = \frac{1}{2} \frac{d[B]}{dt}$
- C) $\frac{-d[A]}{dt} = \frac{1}{4} \frac{d[B]}{dt}$
- D) $\frac{-d[A]}{dt} = 4 \frac{d[B]}{dt}$

Ans: (C)

37. The equilibrium constant for the reaction

$\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{NO}(\text{g})$ is 4×10^{-4} at 2000 K. In presence of a catalyst the equilibrium is attained ten times faster. Therefore the equilibrium constant in presence of catalyst of 2000 K is

- A) 4×10^{-2} B) 40×10^{-4} C) 4×10^{-4} D) 4×10^{-3}

Ans: (C)

38. The correct statement regarding defect in solids is

- A) Schottky defect has no effect on the physical properties of solids
B) Frenkel defect is usually favoured by a very small difference in the sizes of cations and anions
C) Frenkel defect is a dislocation defect
D) Trapping of proton in the lattice leads to the formation of F-centers

Ans: (C)

39. Which of the following statement is incorrect?

- A) The rate law for any reaction cannot be determined experimentally
B) Molecularity is only applicable for elementary reaction.
C) Biomolecular reactions involve simultaneous collision between two species
D) Complex reactions have fractional order

Ans: (D)

40. Hydrogenation of vegetable oils in presence of finely divided Nickel as catalyst. The reaction is

- A) Heterogeneous catalysis B) Homogeneous catalysis
C) Enzyme catalysed reaction D) Liquid catalysed reaction

Ans: (A)

41. Lower members of aliphatic carboxylic acid are soluble in water. This is due to

- A) Water is non electrolyte
B) Due to London forces
C) Formation of hydrogen bonds with water
D) Van der-Waals interaction with water molecules

Ans: (C)

42. For the preparation of Alkanes, aqueous solution of sodium or potassium salt of carboxylic acid is subjected to

- A) Electrolysis B) Oxidation C) Hydrogenation D) Hydrolysis

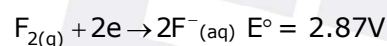
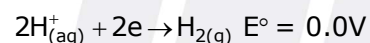
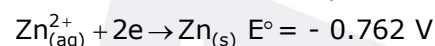
Ans: (A)

43. Bactericidal antibiotics among the following is

- A) Tetracycline B) Ofloxacin C) Chloramphenicol D) Erythromycin

Ans: (B)

44. The standard reduction potential at 298 K for the following half cell reaction



Which of the following is strongest reducing agent?

- A) $\text{H}_{2(\text{g})}$ B) $\text{Zn}_{(\text{s})}$ C) $\text{F}_{2(\text{g})}$ D) $\text{Cr}_{(\text{s})}$

Ans: (B)

45. The magnetic nature of elements depends on the presence of unpaired electrons. Identify the configuration of transition elements which shows highest magnetic moment?
A) $3d^2$ B) $3d^8$ C) $3d^7$ d) $3d^5$

Ans: (D)

46. The electronegativities of C, N Si and P are in the order of
A) $Si < P < N < C$ B) $P < Si < N < C$ C) $Si < P < C < N$ D) $P < Si < C < N$

Ans: (C)

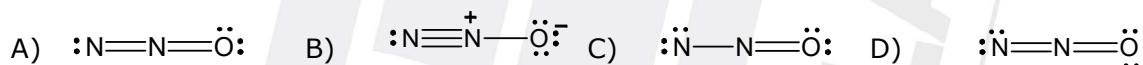
47. The monomer used in Novolac, a polymer used in paints.
A) Butadiene and Styrene B) Phenol and Formaldehyde
C) Butadiene and Acrylo Nitrile D) Melamine and Formaldehyde

Ans: (B)

48. Which of the following order is true regarding the acidic nature of phenol?
A) Phenol > O - cresol > O - nitrophenol
B) Phenol > O - cresol > O - nitrophenol
C) O-cresol < phenol < O - nitrophenol
D) phenol < O-cresol < O - nitrophenol

Ans: (C)

49. Which of the following is the correct electron dot structure of N_2O molecule?



Ans: (B)

50. In a face centred cubic arrangement of A and B atoms in which 'A' atoms are at the corners of the unit cell and 'B' atoms are at the face centers. One of the 'A' atom is missing from one corner in unit cell. The simplest formula of compound is
A) A_7B_3 B) A_7B_8 C) AB_3 D) A_7B_{24}

Ans: (D)

51. The metal extracted by leaching with a cyanide is
A) Al B) Na C) Ag D) Cu

Ans: (C)

52. Reduction of ketones cannot be carried out with which of the following reagents?
A) Zinc amalgam and concentrated HCl
B) Hydrazine and KOH in ethylene glycol
C) Sodium borohydride or Lithium Aluminium hydride
D) Hydrogen in presence of palladium in Barrium sulphate and quinoline

Ans: (D)

53. Gabriel phthalimide synthesis is used in the preparation of primary amine from phthalimide which of the following reagent is not used during the process?
A) HCl B) NaOH C) Alkyl Halides D) KOH

Ans: (A)

54. Which of the following statement is in accordance with the Arrhenius equation?
A) Rate constant decreases exponentially with increase in temperature
B) Rate of reaction does not change with increase in activation energy
C) Rate of a reaction increases with decrease in activation energy
D) Rate of a reaction increases with increase in temperature

Ans: (A)

