KCET 2017 CHEMISTRY QUESTION PAPER

1. 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) 0.1×10^{-3} mol b) 0.5×10^{-3} mol
   c) 1.66×10^{-3} mol d) 9.95×10^{-2} mol

2. The correct set of quantum number for the unpaired electrons of chlorine atom is
   a) $2,0,0,+\frac{1}{2}$ b) $2,-1,-1+\frac{1}{2}$
   c) $3,1,1,\pm\frac{1}{2}$ d) $3,0,0\pm\frac{1}{2}$

3. The electro negativities of C, N, Si and P are in the order of
   a) $P<Si<C<N$ b) $Si<P<N<C$
   c) $Si<P<C<N$ d) $P<Si<N<C$

4. Which of the following structure of a molecule is expected to have three bond pairs and one ione pairs of electrons?
   a) Tetrahedral b) Trigonal Planar
   c) Pyramidal d) Octahedral

5. Which of the following is the correct electron dot structure of N_2O molecule?
   a. :N=N=O: b. :N≡N⁺–O:⁻
   c. :N=N=O: d. :N–N=O:

6. The pressure of real gases is less than that of ideal gas because of
   a) Intermolecular attraction
   b) Finite size of particles
   c) Increases in the number of collisions
   d) Increase in the kinetic energy of the molecules

7. A reaction has both ΔH and $\Delta S-ve$. The rate of reaction
   a) Increases with increase in temperature
   b) Increases with decrease in temperature
   c) Remains unaffected by change in temperature
   d) Cannot be predicted for change in temperature

8. The equilibrium constant for the reaction $N_{2(g)}+O_{2(g)}\rightleftharpoons 2NO_{(g)}$ 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) 40×10^{-4} b) 4×10^{-2}
   c) 4×10^{-3} d) 4×10^{-4}

9. The reaction quotient 'Q_c' is useful in predicting the direction of the reaction. Which of the following is incorrect?
   a) If $Q_C>K_C$, the reverse reaction is favoured
   b) If $Q_C<K_C$, the forward reaction is favoured
   c) If $Q_C=K_C$, no reaction occur
   d) If $Q_C>K_C$, forward reaction is favored

10. $3ClO^-_{(aq)}\longrightarrow ClO^-+2Cl^-$ is an example of
    a) Oxidation reaction
    b) Reduction reaction
    c) Disproportionation reaction
    d) Decomposition reaction

11. In the manufacture of hydrogen from water $(CO+H_2)$, which of the following is correct statement?
    a) CO is oxidized to CO_2 with steam in the presence of a catalyst followed by absorption of CO_2 in alkali.
    b) CO and H_2 are separated based on difference in their densities.
    c) Hydrogen is isolated by diffusion
    d) H_2 is removed by occlusion with pd.

12. Plaster of Paris is represented as
    a) $CaSO_4\cdot\frac{1}{2}H_2O$ b) $CaSO_4.H_2O$
    c) $CaSO_4\cdot2H_2O$ d) $CaSO_4$

13. Addition of mineral acid to an aqueous solution of Borax, the following compound is formed.
    a) Boron hydride b) Orthoboric acid
    c) meta boric acid d) Pyroboric acid

14. Identify the correct statement of the following
a) n – butane and isobutane are functional isomers
b) dimethyl ether and ethanol are chain isomers
c) Propan – 1 – ol and Propan – 2 ol are position isomers
d) Ethanoic acid and methyl methanoate are position isomers

15. In which of the following, haemolytic bond fission takes place?
a) Alkaline hydrolysis of ethyl chloride
b) Addition of HBr to double bond
c) Free radical chlorination of methane
d) Nitration of Benzene

16. For the preparation of Alkanes, aqueous solution of sodium or potassium salt of carboxylic acid is subjected to
a) Hydrolysis b) Oxidation
c) Hydrogenation d) Electrolysis

17. Which one of the following is not a common component of photo – chemical smog?
a) Ozone
b) Acrolein
c) Peroxy acetyl nitrate
d) Chloroflouro carbons

18. Which of the following crystal has unit cell such that $a \neq b \neq c$ and $a \neq \beta \neq 90^{\circ}$?
a) $K_2Cr_2O_7$ b) $NaNO_3$
c) KNO_3 d) K_2SO_4

19. The correct statement regarding defect in solids is
a) Frenkel defect is usually favoured by a very small difference in the sizes of cations and anions
b) Frenkel defect is a dislocation defect
c) Trapping of proton in the lattice leads to the formation of F – centers
d) Schottky defect has no effect on the physical properties of solids

20. 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_{24} b) A_7B_8
c) AB_3 d) A_7B_3

21. Which of the following aqueous solution has highest freezing point?
a) 0.1 molal $Al_2(SO_4)_3$
b) 0.1 molal $BaCl_2$
c) 0.1 molal $AlCl_2$
d) 0.1 molal NH_4Cl

22. The Vant Hoff's factor 'I' accounts for
a) Extent of solubility of solute
b) Extent of dissociation of solute
c) Extent of dissociation of solute
d) Extent of mobility of solute

23. When the pure solvent diffuses out of the solution through the semi – permeable membrane then the process is called
a) Osmosis b) Reverse osmosis
c) Sorption d) Dialysis

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

$Zn^{2+}_{(aq)} + 2e \rightarrow Zn_{(s)} \; E^{\circ} = -0.762V$

$Cr^{3+}_{(aq)} + 3e \rightarrow Cr_{(s)} \; E^{\circ} = -0.740V$

$ZH^{+}_{(aq)} + 2e \rightarrow H2_{(g)} \; E^{\circ} = -0.0V$

$F_{2(g)} + 2e \rightarrow 2F^{-}_{(aq)} \; E^{\circ} = 2.87V$

Which of the following is strongest reducing agent?
a) $Zn_{(s)}$ b) $Cr_{(s)}$
c) $H_{2(g)}$ d) $F_{2(g)}$

25. By passing electric current $NaClO_3$ is converted into $NaClO_4$ according to the following equation

$NaClO_3 + H_2O \rightarrow NaClO_4 + H_2$

How many moles of $NaClO_4$ will be formed when three Faradays of charge is passed through $NaClO_3$?
a) 0.75 b) 1.0
c) 1.5 d) 3.0

26. In the electrolysis of aqueous sodium chloride which of the half-cell reaction will occur at anode?
a) $Na^{+}_{(aq)} + e^{-} \rightarrow Na_{(s)} E^{0} = -2.71 \text{ volts}$
b) $2H_2O_{(l)} \rightarrow O_2 + 4H^{+} + 4e - E^{\circ}_{cell} = 1.23 \text{ volts}$
c) $H^{+}_{(aq)} + e^{-} \rightarrow \frac{1}{2} H_2 E^{0}_{cell} = 0.00 \text{ volts}$
d) $Cl^{-}_{(aq)} \rightarrow \frac{1}{2} Cl_2 + e^{-} E^{0}_{cell} = 1.36 \text{ volts}$

27. Which of the following statement is in accordance with the Arrhenius equations?
a) Rate of a reaction increases with increase in temperature
b) Rate of a reaction increases with decreases in activation temperature
c) Rate constant decreases exponentially with increase in temperature
d) Rate of reaction does not change with increase in activation energy

28. Which of the following statement is incorrect?
a) The rate law for any reaction cannot be determined experimentally
b) Complex relations have fractional order
c) Biomolecular reactions involve simultaneous collision between two species
d) Molecularity is only applicable for elementary reaction

29. 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) $\frac{-d[A]}{dt} = 4\frac{d[B]}{dt}$ b) $\frac{-d[A]}{dt} = \frac{1}{4}\frac{d[B]}{dt}$
c) $\frac{-d[A]}{dt} = \frac{1}{2}\frac{d[B]}{dt}$ d) $\frac{-d[A]}{dt} = \frac{d[B]}{dt}$

30. The process which is responsible for the formation of delta at a place where rivers meet the sea is
a) Coagulation b) Colloid formation
c) Emulsification d) Peptization

31. 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

32. Which of the following is not a true a favorable condition for physical adsorption?
a) High temperature
b) High pressure
c) Higher critical temperature of adsorbate
d) Low temperature

33. The metal extracted by leaching with a cyanide
a) Al b) Ag
c) Cu d) Na

34. Extraction of chlorine from brine solution is based on
a) Oxidation b) Chlorination
c) Reduction d) Acidification

35. Which of the following element forms $p_\pi - p_\pi$ bond with itself?
a) N b) P
c) Se d) Te

36. Which one of the following metallic oxide exhibit amphoteric nature?
a) CaO b) Na_2O
c) BaO d) Al_2O_3

37. Select wrong chemical reaction among the following:
a) $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$
b) $8NH_3 + 3Cl_2 \rightarrow 6NH_4Cl + N_2$
c) $2NaOH + Cl_2 \rightarrow 2NaCl + H_2 + O_2$
d) $2Ca(OH)_2 + 2Cl_2 \rightarrow Ca(OCl)_2 + CaCl_2 + 2H_2O$

38. Which one of the following noble gas has an unusual property of diffusing through the materials such as rubber, glass or plastic?
a) Ne b) Ar
c) Kr d) He

39. The magnetic nature of elements depends on the presence of unpaired electrons. Identify the configuration of transition elements which shows highest magnetic moment?
a) $3d^7$ b) $3d^5$
c) $3d^8$ d) $3d^2$

40. Which of the following statement is wrong regarding Lanthanoids?
a) $Ln(III)$ compounds are generally colourless
b) $Ln(III)$ compounds are predominantly ionic in character
c) The ionic size of $Ln(III)$ ions decreases with increasing atomic number
d) $Ln(III)$ Hydroxides are mainly basic in nature.

41. 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

42. According to crystal field theory, the M – L bond in a complex is
a) Purely ionic
b) Purely covalent
C Purely co – ordinate
c) Partially covalent

43. The co – ordination number and the oxidation state of the element 'M' in the complex $[M(en_2)(C_2O_4)]NO_2$ (Where(en) is ethan – 1, 2 – diamine) are respectively
a) 6 and 3 b) 6 and 2
c) 4 and 2 d) 4 and 3

44. Toluene reacts with halogen in presence of Iron (III) chloride giving ortho and para halo compounds. The reaction is
a) Electrophilic elimination reaction
b) Electrophilic substitution reaction
c) Free radical addition reaction
d) Nucelophilic substitution reaction

45. In the following sequence of reactions

$$CH_3Br \xrightarrow{KCN} A \xrightarrow{H_3O^+} B \xrightarrow{LiA/H_4} C$$

The end product C is
a) Acetone b) Methane
c) Acetaldehyde d) Ethyl Alcohol

46. Which of the following order is true regarding the acidic nature of phenol?
a) Phenol > O – cresol > O – nitrophenol
b) O cresol < phenol < O – nitrophenol
c) Phenol < O – cresol > O – nitrophenol
d) Phenol < O – cresol > O – nitrophenol

47. Which of the following reagent cannot be used to oxidize primary alcohols to aldehydes?
a) CrO_3 in anhydrous medium
b) $KMnO_4$ in acidic medium
c) Pyridinium chloro chromate
d) Heating in pressure of Cu at 573 K

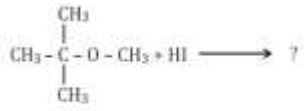
48. Cannizzaro's reaction is an example of auto oxidation
a) It is a typical reaction answered of aliphatic aldehyde
b) It is a reaction only by aromatic aldehydes
c) It is a reaction answered by all aldehydes
d) It is a reaction answered by only aldehydes containing α – hydrogen

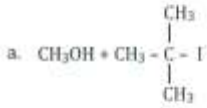
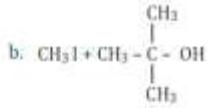
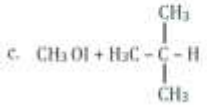
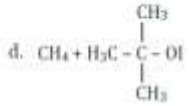
49. Lower members of aliphatic carboxylic acid are soluble in water. This is due to
a) Formation of hydrogen bonds with water
b) Van der – Waals interaction with water molecules
c) Water is non electrolyte
d) Due to London forces

50. The correct order of increasing basic nature for the bases NH_3, CH_3NH_2 and $(CH_3)_2NH$ in aqueous solutions
a) $CH_3NH_2 < NH_3 < (CH_3)_2NH$
b) $(CH_3)_2NH < NH_3 < CH_3NH_2$
c) $NH_3 < CH_3NH_2 (CH_3)_2NH$
d) $CH_3NH_2 < (CH_3)_2NH < NH_3$

51. Reduction of ketones cannot be carried out which of the following reagents?
a) Sodium borohydride or Lithium Aluminium hydride
b) Zinc amalgam and concentrated HCl
c) Hydrazine and KOH in ethylene glycol
d) Hydrogen in presence of palladium in Barium sulphate and quinolone

52. The product formed during the following reaction are



a. 
b. 
c. 
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) KOH b) NaOH
c) HCl d) Alkyl Halides

54. The Glycosidic linkage present in sucrose is between
a) C – 1 of α glucose and C – 2 of β - fructose
b) C – 1 of α – Glucose and C – 4 of α – glucose
c) C – 1 of β – galactose and C – 4 of α – glucose
d) C – 1 of α – glucose and C – 4 of β – fructose

55. Hormones are secreted by ductless glands of human body. Iodine containing hormone is
a) Insulin b) Thryoxine
c) Testosterone d) Adrenaline

56. Pick the wrong statement from the following
a) Sources of Vitamin B_1, are yeast, milk, green vegetables and cereals
b) Deficiency of Vitamin B_2, (pyridoxine) results in convulsions
c) Consumption of citrus fruits and green leafy vegetables in food prevents scurvy
d) Deficiency of vitamin D cause xerophthalmia.

57. The monomer used in Novolac, a polymer used in paints
a) Phenol and Formaldehyde
b) Melamine and Formaldehyde
c) Butadiene and Styrene
d) Butadiene and Acrylo Nitrile

58. Which of the following is not a biodegradable polymer?
a) Polyhydroxy butyrate - CO – β hydroxy valerate
b) pHBV
c) Nylon – 2 – Nylon – 6
d) Glyptol

59. Bactericidal antibiotics among the following is
a) Ofloxacin b) Erythromycin
c) Tetracycline d) Chloramphenicol

60. Pick the correct statement among the following
a) Cety trimethyl ammonium bromide is a popular cationic detergent used in air conditioner
b) Non – ionic detergents is formed when polyethylene glycol reacts with adipic acid
c) Sodium dodecyl benzene sulphonate used in tooth paste is a cationic detergent
d) Sodium lauryl sulphate forms an insoluble scum with hard water

ANSWER KEYS

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