GGSIPU Chemistry 2005

1. The standard e.m.f.for the cell reaction, $2Cu^+_{aq} \rightarrow Cu_s + Cu^{2+}_{aq}$ is +0.36 V at 298 K.The equilibrium constant of the reaction is :

<div align="center">

a 5×10^6 b 1.4×10^{12}

c 7.4×10^{12} d 1.2×10^6

</div>

2. The standard e.m.f of the cell ,Cds │CdCL$_2$aq 0.1 M   ││AgCLs │Ags in which the cell reaction is :

Cds+2AgCLs   →2Ags+Cd $^{2+}$aq+2CL⁻aq

Is 0.6915 V at 0^0 C and 0.6753 V at 25^0 C.The enthalpy change of the reaction at 25^0 C.The enthalpy change of the reaction at 25^0C is :

<div align="center">

a   -176 kJ   b   -234.7 kJ

c   +123.5 kJ d   -167.26 kJ

</div>

3. Which of the following statement is true ?

    a The relative lowering of vapour pressure of a solution is equal to the mole fraction of the solute present in the solution.

    b Passage of solute molecules towards solution side through semipereable membrance is osmosis.

    c The boiling point of a solution is always lower than the solvent

    d The boiling point of a liquid is the temperature at which its vapour becomes equal to 260 mm

4. The deviation from the ideal gas behavior of a gas can be expressed as :

<div align="center">

a $Z = \dfrac{P}{VRT}$ b $Z = \dfrac{PV}{nRT}$

c $Z = \dfrac{nRT}{PV}$ d $Z = \dfrac{VR}{PT}$

</div>

5. Which of the following statement is not true ?

    a The pressure of a gas is due to collis ion of the gas molecules with the walls of the container

b The molecular velocity of any gas is proportional to the square root of the absolute temperature

c The rate of diffusion of a gas directly proportional to the density of the gas at constant pressure

d Kinetic energy of an ideal gas is directly proportional to the absolute temperature

6. The unit of second order reaction rate constant is :

    a $L^{-1}.mol.s^{-1}$

    b $L^{2}.mol^{-2}.s^{-1}$

    c $L.mol^{-1}.s^{-1}$

    d s^{-1}

7. Hess' law states that :

    a the standard enthalpy of an overall reaction is the sum of the enthalpy changes in individual reactions

    b enthalpy of formation of a compound is same as the enthalpy of decomposition of the compound into constituent elements,but with opposite sign

    c at constant temperature the pressure of a gas is inversely proportional its volume

    d the mass of a gas dissolved per litre of a solvent is proportional to the pressure of the gas in equilibrium with the solution

8. The half-life of a reaction is halved as the initial concentration of the reactant is doubled.The order of the reaction is :

    a 0.5   **b** 1

    c 2   **d** 0

9. One gram of A decays by β-emission to 0.125 g in 200 years.The half life period of the reaction is :

    a 0.014 years   **b** 6.66 years

    c 66.6 years   **d** 666 years

10. Isotopes are :

    a atoms of different elements having same mass number

b atoms of same elements having same mass number

c atoms of same element having different mass number

d atoms of different element having same number of neutrons

11. Acid hydrolysis of sucrose is a :

a pseudo first order reaction

b zero order reaction

c second order reaction

d unimoleculalar reactior

12. The product obtained after posirtron emission from $31^{Ga^{68}}$ is :

a $30^{Ga^{68}}$ b $30^{Zn^{68}}$

c $31^{Zn^{69}}$ d $31^{Ga^{69}}$

13. The relationship between coefficient of viscosity of a liquid and temperature can be expressed as :

a $\eta = Ae^{ERT}$ b $\eta = Ae^{E/RT}$

c $\eta = ET/R$ d $\eta = Ae^{RT/E}$

14. An aqueous solution in which the H^+ ion concentration is greater than 10^{-7} M is said to be :

a acidic   b alkaline

c neutral   d none of these

15. In the hydrolysis of a salt of weak acid and weak base ,the hydrolysis constant K_h is equal to :

a $\dfrac{K_w}{K_b}$ b $\dfrac{K_w}{K_a}$

c $\dfrac{K_w}{K_a \times K_b}$ d $K_a \times K_b$

16. In the following reaction, $AgCL+KI \rightleftharpoons KCL+AgI$ as KI is added,the equilibrium is shifted towards right giving more AgI precipitat,because :

a both AgCL and AgI are sparingly soluble

b the K_{sp} of AgI is lower than K_{sp} of AgCL

c   the K $_{sp}$ of AgI is higher than K_{sp} of AgCL

d   bothAgCL and AgI have same   solubility product

17.   In the nuclear reaction ;

$$13^{AL^{27}} + 2^{He^4} \rightarrow 14^{X^{30}} + 1^{H^1}, \text{x is :}$$
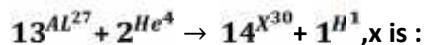
a   Si b AL   c Mg d P

18.   What kind of molecule $ALCL_3$ is ?

a Bronsted acid   b Lewis acid

c Lewis base   d Bronsted base

19.   How much $K_2Cr_2O_7$ molecular weight = 294.19 is required to prepare one litre of 0.1 N olution ?

a   9.8063 g   b 7.3548 g

c   3.6774 g   d 4.903 g

20.   The ionic strength of a solution containing 0.1 mol/kg of KCL and o.2 mol/kg of $CuSO_4$ is :

a 0.3 b 0.6   c 0.9 d 0.2

21.   A gas can expend from 100 mL to 250 mL under a constant pressure of 2 atm.The work done by gas is :

a 30.38 joule   b 25 joule

c 5 k Joule   d 16 joule

22.   If the r.m.s speed of gaseous molecule is xm/sec at a pressure P atm,then what will be the r.m.s speed at a pressure 2P atm and constant temperature ?

a x   b 2x c 4x d x/4

23.   Ionic mobility of Ag^+ Is λ_{Ag^+}=$5X10^{-1}$ ohm^{-1} cm^2 eq^{-1}:

a 5.2X10 $^{-9}$ b 2.4X10 $^{-9}$

c 1.52X10 $^{-9}$ d 8.25X10 $^{-9}$

24.   Which of the following is the strongest acid ?

a HF   b HCL   c HBr   d HI

25.   What is the general outer electronic configuration of the coinage metal ?

a ns ^{2} np^6 b n -1d ^{10} ns^1

b n -1d ^{10} ns^2 d n -1d ^{9} ns^2

26. How does the ionization energy of 1st group elemeny vary?

a Increases down the group

b   Decreases down the group

c Remains unchanged

d Variation is not regular

27. What I the oxidation number of cholrine in ClO_3^- ?

a +5   b +3 c +4 d +2

28. What type of hybridsation takes place in the N atom of NH_3 ?

a sp ^{2} b sp ^{3} c dsp ^{2} d sp

29. What is the co-ordination number of CL$^-$ in a NaCL crystal ?

a 8   b 6   c 4   d 3

30. How many electrons are involved in oxidation of $KMnO_4$ in basic medium ?

a 1   b 2   c 5   d 3

31.The magnetic moment of K_3[FeCN $_6$] is found to be 1.7 BM.How many unpaired electron s is/are present per molecule ?

a 1   b 2   c 3   d 4

32. Which among the following is an electron deficient compound ?

a NF $_3$ b PF $_3$

c BF $_3$ d AsF $_3$

33. Arrange the hydra-acids of halogens in increasing order of acidity .

a HF<HCL<HBr<HI

b   HI<HBr<HCL<HF

c HF<HBr<HI<HCL

d HF<HI<HBr<HCL

34. What is the product of the reaction of H_2O_2 with CL_2 ?

a O_2 + HOCL   b HCL + O_2

c H_2O + HCL   d HCL + H_2

35. Which of the following organo-silicon compound on hydrolysis will give a three dimensional silicon ?

a R_3SiCL b $RSiCL_3$

c $SiCL_4$ d R_2SiCL_2

36. NaOCL is used as a bleching agent and sterilizing agent.It can be synthesized by the action of

a NaCL with H_2O

b NH_4CL with NAOH

c CL_2 with cold and delute NaOH

d Cl_2 with hot and concentrated NaOH

37. How can you synthesize nitric oxide in the liboratory ?

a Zinc with cold and delute HNO_3

b Zinc with concentrated HNO_3

c Copper with cold and delute HNO_3

d   Heating NH_4NO_3
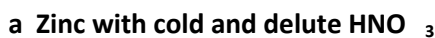
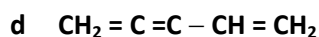38. Which of the following does not have a lone pair on the central atom ?
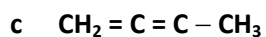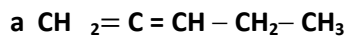
a NH_3 b PH_3 c BF_3 d PCL_3
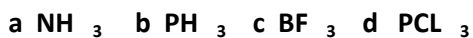
39. Which colourless gas evolves when NH_4CL reacts with Zinc in a dry cell battery ?

a NH_3 b N_2 c H_2 d CL_2

40. What is the nature of the bond between B and O in $C_2H_5_2OBH_3$?

a Covalent   b Co   -ordinate covalent

c Ionic bond   d Banana shaped bo   nd

41. An alkene gives two moles of HCHO,one mole of CO_2 and one mole of CH_3COCHO on ozonolysis.What is its structure ?

a $CH_2 = C = CH - CH_2 - CH_3$

b $CH_2 = CH - CH - CH = CH_2$

$$CH_3$$
$$|$$

c $CH_2 = C = C - CH_3$
$$|$$
$$CH_3$$

d $CH_2 = C = C - CH = CH_2$

$$CH_3$$
$$|$$
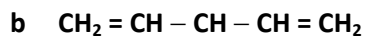
42. IUPAC name of the compound,

$$CH_3$$
$$|$$

$CH_3 - CH2 - CH - CH_2 - CH - CH_2 - CH_2 - CH_3$

$$|$$

CH

CH₃   CH₃
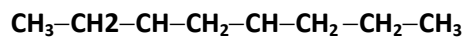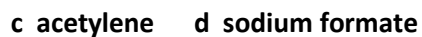
a   4-isoprophyl,6-methyl octane

b   3-methyl,5-1 -methyl elthyl octane

c   3-methyl,5 isoprophyl octane

d   6-methyl,4-1 -methylethyl octane

43. The order of melting point of ortho,para,meta-nitrophenol is

a 0>m>p   b p>m>o

c m>p>o   d   p>o>m

44. When $CHCL_3$ is boiled with NaOH,it gives :

a formic acid   b   trihydroxy methane

c acetylene   d sodium formate

45. Which of the following is an example of ketohexose ?

a Mannose   b galactose

c Maltose   d Fructose

46. When aniline is treated with sodium nitrite and hydrochloric acid at 0^0 C,it gives

a phenol and N_2

b diazonium salt

c hydrazo compound

d no reaction takes place

47. When benzoic acid is treated with PCL_5 at 100^0C,it gives :

a benzoyl chloride

b 0 -chalorobenzoic acid

c p -chalorobenzoic acid

d benzyl chloride

48. The key step in Cannizaro's reaction is the intermolecular shift of :

a proton   b hydride -ion

c hydronium ion   d hydrogen bond

49. Aldehydes and ketones can be reduced to hydrocarbon by using :

a LiALH $_4$ b H $_2$/pd-BaSO$_4$

c Na -Hg/HCL   d NH $_2$−NH$_2$/C$_2$H$_5$ONa

50. Cinnamic acid is formed when C_6H_5−CHO condenses with CH $_3$CO $_2$O in presence of :

a concentrated H $_2$SO^4

b sodium acetate

c sodium metal

d anhydrous ZnCL $_2$

51. What is the product of the reaction of phenol with CHCL$_3$ in aqueous NaOH and subsequent and hydrolysis ?

a Salicylic acid   b Salicylaldehyde

c Benzoic acid   d Benzaldehyde

52. On treatment with chlorine in presence of sunlight,tolune gives the product :

a o -choloro tolune

b 2,5 -dichloro tolune

c p -chloro toluene

d benzyl chloride

53. Which of the following cycloalkane gives open chain compound,when reacts with bromine ?

a Cyclopropane   b Cyclopentane

c Cyclohexane   d Cyclooctane

54. Which of the following intermediate have the complete octate around the carbon atom ?

a Carbonium ion   b Carbanion

d Free redial   d Carbene

55. If the dipole moment of toluene and nitro-benzene are 0.43 D and 3.93 D,Then what is the expected dipole moment of P-nitro toluene ?

a 3.50 D   b 2.18 D

c 4.36 D   d 5.30 D

56. What is the product when 2-butyne is treated with liquid NH_3 in presence of lithium ?

a n-butane   b cis -2 butene

c trans -2-butene   d 1 -butene

57. In the dichlorination reaction of propane,mixure of products are obtainedHow many isomers the mixture contains ?

a 2   b 3

c 4   d 5

58. Cyclopentadieny1 anion is :

a aromatic   b non   -aromatic

c non -planer   d aliphatic

59. What is the product of the reaction of 1,3-butadiene with Br_2 ?

a 1,4 -dibromo butane

b 1,2 dibromo butane

c 3,4 -dibromo butane

d 2,3 -dibromo to butane

60. The most common type of reaction in aromatic compound is :

a   elimination reaction

b addition reaction

c electrophilic substitution reaction

b rearrangement reacttion