GGSIPU chemistry 2007

1.   Which of the following is not an ore of magnesium ?

        a carnallite   b Dolomite

        c Calamine   d sea water

2. The atomic number of Ni and Cu are 28 and 29 respectively.The electronic configuration $1s^2,2s^2,2p^6,3s^2,3p^6,3d^{10}$ represents

      a Cu $^+$ b Cu $^{2+}$

      c Ni $^{2+}$ d Ni

3.   In the following the element with the highest ionization energy is

      a $[Ne]3s^2 3p^1$ b $[Ne]3s^2 3p^3$

      c $[Ne] 3s^2 3p^2$ d $[Ne]3s^2 3p^4$

4. in the conversion of Br_2 to BrO_3^-,the oxidation number of Br changes from

      a zero to +5   b +1 to +5

      c zero to -3   d +2 to +5

5. Among the alkali metal cesium is the most reactive because

        a its incomplete shell is nearest to the nucleus

        b it has a single electron in the valence shell

        c it is the haviest alkali metal

        d the outermost electron is more lo   osely bound than the outermost electron of the other alkali metals

6. Which of the following represents the Lewis structure of N_2 molecule ?

     a $^x_xN \equiv N^x_x$ b $^{x\,x\,x}_{x\,N} \equiv ^{x\,x\,x}_{N\,x}$

     c $^{x\,x\,x}_{x\,N\,x} - ^{x\,x^x}_{x\,x\,x}$ d $^{x\,x\,x}_{x\,x\,x} = ^{x\,x^x}_{x\,x\,x}$

7. Hydrogen bond is strongest in

     a S – H ... O   b O   – H ... S

c   F – H … F   d O   – H … N

8. The decomposition of a certain mass of $CaCO_3$ gave 11.2 dm^3 of CO_2 gas at STP.The mass of KOH required to completely neutralize the gas is

    a 56 g   b 28 g

    c 42 g   d 20 g

9. The density of a gas is 1.964g dm^{-3} at 273 K and 76 cm Hg.The gas is

    a CH_4 b C_2H_6

    c CO_2 d Xe

10. 0.06 mole of KNO_3 solid is added to 100 cm^3 of water at 298 K.The enthalpy of KNO_3 aqueous solution is 35.8 kj mol^{-1} .After the solute is dissolved the temperature of the solution will be

    a 293 K   b 298 K

    c 301 K   d 304 K

11. 4 moles each of SO_2 and O_2 gases are allowed to react to form SO_3 in a closed vassel.At equilibrium 25% of O_2 is used up.The total number of moles of all the gases at equilibrium is

   a 6.5   b 7.0

    c 8.0   d 2.0

12. An example for autocatalysis is :

    a oxidation of NO to NO_2

    b oxidation of SO_2 to SO_3

    c decomposition of of $KCLO_3$ to KCL and O_2

    d oxidation of oxalic acid by acidified $KMnO_4$

13. During the fusion of an organic compound with sodium metal,nitrogen of the compound is converted into

    a $NaNO_2$ b $NaNH_2$

    c NaCN   d NaNC

14. Identify the product Y in the following reaction sequence

    $CH_2 -CH_2 -C$ Heat   Zn-Hg

|
$CH_2 - CH_2 - COO$ $\xrightarrow[\text{HCL,heat}]{}$ Ca → X → Y
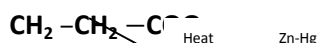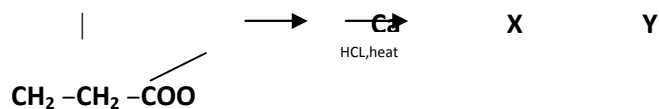
a   Pentane
b   Cyclobutane
c   Cyclopentane
d   Cyclopentanone

15. The reaction C_2H_5 ONa + C_2H_5 → $C_2H_5OC_2H_5$ + NaI is known as

      a Kolbe's synthesis

      b Wurtz's synthesis

      c Williamson's synthesis

      d Grignard's synthesis

16. Glucose contains in addition to aldehyde group

      a one secondary OH and Four primary OH   groups

      b one primary OH and four secondary OH groups

      c two primary OH and three secondary OH groups

      d three primary OH and two secondary OH grou ps

17. Which of the following taking place in the blast furnace is endothermic ?

      a $CaCO_3 \rightarrow CaO + CO_2$

      b $2C + O_2 \rightarrow 2CO$

      c $C + O_2 \rightarrow CO_2$

      d $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

18. The formula mass of Mohr's salt is 392.The iron present in it is oxidised by $KMnO_4$ In acid medium.The equivalent mass of Mohr's salt is :

      a 392   b 31.6

      c 178   d 156

19. Which of the following solutions will exhibt highest boiling point ?

a 0.01 M Na $_2$SO$_4$ aq

b 0.01 M KNO $_3$ aq

c 0.015 M urea aq

d 0.015 M glusco aq

20. The highest magnetic moment is shown by the transition metal ion with the configuration

a 3d ^{2} b 3d ^{5}

c 3d ^{7} d 3d ^{9}

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

a a chelating agent

b a central metal in a coo rdination compound

c an oxidizing agent

d a reducing agent

22. In which of the following complex ion ,the central metal ion is in a state of sp^{3}d^2 hybridsation ?

a [CoF $_6$]$^{3-}$ b [CoNH $_{3\ 6}$]$^{3+}$

c [FeCN $_6$]3 -   d [CrNH $_{3\ 6}$]$^{3+}$

23. Which of the following can participate in linkage isomerism ?`

a NO $^-_2$

b H $_2$NCH$_2$CH$_2$ N H$_2$

c H $_2$O

d : NH $_3$

24. Which of the following has the highest bond order ?

a N $_2$ b O $_2$

c He $_2$ d H $_2$

25. Which of the following is diamagnetic ?

a H_2^+ b O_2

c Li_2 d He_2^+

26. The concentration of a reactant X decreases from 0.1 M to 0.005 M in 40 min.If the reaction follows first order kinetics,the rate of the reaction when the concentration of x is 0.01 M will be

a 1.73×10^{-4} M min^{-1}

b 3.47×10^{-4} M min^{-1}

c 3.47×10^{-5} M min^{-1}

d 7.5×10^{-4} M min^{-1}

27. Chemical reactions with very high E_a values are generally

a very fast   b very slow

c moderately fast   d spontaneous

28. which of the following does not conduct electricity ?

a Fused NaCL

b Solid NaCL

c Brine solution

d Copper

29. When a quantity of electricity is passed through $CuSO_4$ solution,0.16 g of copper gets deposited.If the same quantity of electricity is passed through acidulated water,then the volume of H_2 liberated at STP will be

[given : atomic weight of Cu = 64]

a   4.0 cc   b 56 cc

c   604 cc   d 8.0 cc

30. Solubility product of a salt AB is 1×10^{-8} M^2 in a solution in which the concentration of A$^+$ ions is 10^{-3} M>the salt will precipitate when the concentration of B$^-$ ions is kept

a between 10^{-8} M to 10^{-7} M

b between 10^{-7} M to 10^{-8} M

c $> 10^{-5}$ M

d $<10^{-8}$ M

31. Wheich one of the following conditions will increase the voltage of the cell represented the equation ?

Cus +2Ag $^+$ aq $\rightleftharpoons$ Cu^{2+} aq + 2Ags
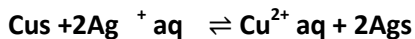
    a   Increase in the dimension of Cu electrode
    b   Increase in the dimension of Ag electrode
    c   Increase in the concentration of Cu^{2+} ions
    d   Increse in the concentration of Ag$^+$ ions

32. The pH of 10^{-8} M HCL solution is

    a 8   b more than 8

    c between 6 and 7   d slightly more tha   n 7

33. The mass of glucose that should be dissolved in 50 g of water in order to produce the same lowering of pressure as is produced by dissolving 1 g of urea in the same quantity of water is

    a 1 g   b 3 g

    c 6 g   d 18 g

34. Osmotic pressure observed when benzoic acid is dissolved in benzene is less than expected from theoretical considerations .This is because

    a benzoic acid is   an organic solute

    b benzoic acid has higher molar mass than benzene

    d benzoic acid gets associated in benzene

    d benzoic acid gets dissociated in ben   zene

35. For a reaction to be spontaneous at all temperatures

    a ΔG and ΔH should be negative

    b ΔG and ΔH should be positive

    c $\Delta G = \Delta S = 0$

    d $\Delta H < \Delta G$

36. Which of the following electrolyte will have maximum flocculation value for FeOH) $_2$ sol ?

    a naCL   b Na $_2$S

c $NH_4{}_3PO_4$ d K_2SO_4

37.   For a reversible reaction Xg + 3Yg   ⇌ 2 Zg;   ΔH= -40 kj,the standard entropies of X,Y and Z are 60,40 and 50 JK^{-1} mol^{-1} respectively.The temperature at which the above reaction attains equilibrium is about

a 400 K   b 500 K

c 273 K   d   373 K

38. The radii of Na^+ and CL^- ions are 95 pm and 181 pm restectrively.the edge length of NaCL unit cell is

a 276 pm   b 138 pm

c 552 pm   d 415 pm

39.Inductive effect involves

a displacement of   σ-electrons

b delocalization of π-electrons

c delocalization of   σ-electrons

d displacement of   π-electrons

40. The basic of aniline is less than that of cyclohexylamine.This is due to

a +R effect to $-NH_2$ group

b   -I effect of $-NH_2$ group

c   -R effect of $-NH_2$ group

d hyperconjugation effect

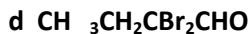41.   Methyl bromide is converted into ethane by heating it in other medium with

a Al   b Zn   c Na   d Cu

42. Which of the following compound is expected to be optically active ?

a $CH_3{}_2$CHCHO

b $CH_3CH_2CH_2CHO$

c $CH_3CH_2CHBrCHO$

d $CH_3CH_2CBr_2CHO$

43. Which cycloalkane has the lowest heat of combustion per CH_2 group ?
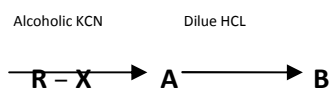
   a   Cyclopropane   b $FeCL_3$

   c   anhydrous $ZnCL_2$ d   Cu

44. The catalyst used in the preparation of an alkyl chloride by the action of dry HCL on an alcohol is

   a   anhydrous $ALCL_3$ b   Cyclobutane

   c   Cyclopentane   d   Cyclohexane

45. In the reaction

   Alcoholic KCN   Dilue HCL

   R – X $\longrightarrow$ A $\longrightarrow$ B

   The product B is

   a   Salicylic acid   b   Phenol

   c   Benzoic -acid   d   4 -nitrobenzoic acid

46. Which of the following compound would not evolve CO_2 when treated with $NaHCO_3$ solution ?

   a Salicylic acid   b phenol

   c Benzoic acid   d 4   -nitrobenzoic acid

47. By heating phenol with chloroform in alkali,it is converted into

   a salicylic acid   b salicyladehyde

   c anisole   d   phenyl benzoate

48. When a mixture of calcium benzoate and calcium acetate is dry distilled,the resulting compound is

   a acetophenon   b banzaldehyde

   c benzophenone   d acetaldehyde

49. Which one of the following does not give benzoic acid on hydrolysis ?

   a Phenyl cyanide   b Benzoyl chloride

   c Benzyl chloride   d Methyl benzoate

50. Which of the following would undergo Hofmann reaction to give a primary amine ?

$$\text{a} \quad R-\overset{\overset{\displaystyle O}{\|}}{C}-CL \qquad \text{b} \quad RCONHCH_3$$

c $RCONH_2$ d $RCOOR$