GGSIPU chemistry 2009

1. Increasing order lowest first for the values of e/m for electro e,proton p,neutron n and α-particles is

    a e,p,n, α b n, α,p,e

    c n,p,e, α d n,p, α,e

2. A particle moving with a velocity 10^6 m/s will have de-Broglie wavelength nearly

    [Given, m = 6.62×10^{27} kg, h=6.62×10^{-34} J-s]

    a 10^{-9}
   b 10^{-13}
    c 10^{-19}
    d   1 $\overset{\circ}{A}$

3. Bohr's radius of 2nd orbit of Be^{3+} is equal to that of

    a 4th orbit of hydrogen

    b 2nd orbit of He^+

    c 3rd orbit of Li^{2+}

    d first orbit of hydrogen

4. Half-life period of a radioactive element is 100 yr.How long will it take for its 93.75% decay ?

    a 400 yr   b 300 yr

    c 200 yr   d 193 yr

5. Two vessels containing gases A and B are interconnected as shown in the figure.The stopper is opened,the gases are allowed to mix homogeneously .The partial pressures of A and B in the mixture will be, respectively

    Gas A   Gas B

    12 L 8 atm   8 L 5 atm
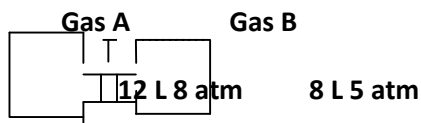
    a   8 and 5 atm
    b   9.6 and 4 atm
    c   4.8 and 2 atm

        d   6.4 and 4 atm

6.   The temperature, at which a gas shows maximum ideal behavior,is known as

        a Boyle's temperature

        b inversion temperature

        c   critical temperature

        d   absolute temperature

7. The unit of rate constant of a second order reaction is

        a mol/L -s

        b L/mol -s

        c L ^{2}/mol^2-s

        d   per second

8. $2N_2O_5 \rightleftharpoons 4NO_2 + O_2$

   For the above reaction which of the following is not correct about rates of reaction ?

      a $\dfrac{-d[N_2O_5]}{dt} = 2\dfrac{d[O_2]}{dt}$

      b $\dfrac{-2d[N_2O_5]}{dt} = \dfrac{d[NO_2]}{dt}$

      c $\dfrac{d[N_2O_5]}{dt} = 4\dfrac{d[O_2]}{dt}$

      d $\dfrac{-2d[N_2O_5]}{dt} = 4\dfrac{d[NO_2]}{dt} = \dfrac{d[O_2]}{dt}$

9. A+B $\longrightarrow$ Product

   If concentration of A is doubled, rate increases 4 times. If concentrations of A and B both are doubled ,rate increases 4 times. If concentrations of A and B both are doubled, rate increases 8 times. The differential rate equation of the reaction will be

     a $\dfrac{dC}{dt} = kC_A \times C_B$ b $\dfrac{dC}{dt} = kC_A^2 \times C_B^3$

     c $\dfrac{dC}{dt} = kC_A^2 \times C_B$ d $\dfrac{dC}{dt} = kC_A^2 \times C_B^2$

10. Which of the following is a wrong statement about equilibrium state ?

        a Rate of forwa rd reaction = Rate of backward reaction

        b Equilibrium is dynamic

c Catalysis increase value of equilibrium constant

d Free energy change is zero

11. A+B $\rightleftharpoons$ C+D Initially moles of A and B are equal.At equilibrium ,moles of C are three times that of A.The equilibrium constant of the reaction will be

a 1   b 3   c | 4   d 9

12. If for $N_2+3H_2 \rightleftharpoons 2NH_3$, K_{eq} for the reaction $NH_3 \rightleftharpoons \frac{1}{2}N_2 + \frac{3}{2}H_2$ will be

a 6.25 b 25   c 250 d 500

13. A weak acid HX has dissociation constant 10^{-5} . The pH of 0.1 M solution of this acid will be

a 2 b 3 c 4   d 5

14. Which of the following is not a buffer solution ?

a 100 mL 0.1 M CH $_3$COOH + 50 mL 0.1 M CH_3COONa

b 100 mL 0.1 M CH $_3$COOH + 50 mL 0.1 M NaOH

c 50 mL 0.1 M CH $_3$COOH + 100 mL 0.1 M NaOH

d 100 mL: 0. 1 M NH_4OH + 50 mL 0.1 M HCL

15. If K_{sp} of Ag_2S is 10^{-17}, the solubility of Ag_2S in 0.1 M solution of Na_2S will be

a 10^{-8} b 5×10^{-9}

c 10^{-15} d 10^{-16}

16. Which of the following has the highest solubility product ?

a CuS   b Bi $_2S_3$

c   CdS   d   ZnS

17. The pH values of 0.1 solution of HCL, CH_3COOH, NH_4CL and CH_3COONa will have the order

a HCL<CH $_3$COOH<NH$_4$CL<CH$_3$COONa

b CH $_3$COONa<NH$_4$CL<CH$_3$COOH<HCL

c NH $_4$CL<CH$_3$COONa<CH$_3$COOH<HCL

d All will   have same pH value

18. For the titration of solution of oxalic acid and sodium hydroxide, the suitable indicator is

a phenolphthalein

b methyl orange

c any of these

d None of these

19. If 'F' is faraday and 'N' is Avogadro number, then charge of the4 electron can be expressed as

   a F×N   b $\dfrac{F}{N}$

   c $\dfrac{N}{F}$ d F ^{2}N

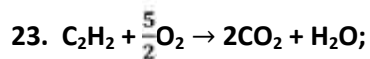20. By passing 9.65 A current for 16 min 40 s, the volume of O_2 liberated at STP will be

   a 280 mL   b   560 mL

   c   1120 mL   d 2240 mL

21. By diluting a weak electrolyte, specific conductivity K $_c$ and equivalent conductivity λ_c change as
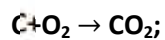
   a both increase

   b K_c increases , λ_c decreases

   c K $_c$ decreases, λ_c increases

   d both   decrease
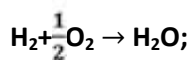
22. In daniel cell, anode and cathode are respectively

   a Zn | Zn^{2+} and Cu^{2+} | Cu

   b Cu | Cu^{2+} and Zn^{2+} | Zn

   c Fe | Fe^{2+} and Cu^{2+} | Cu

   d Cu | Cu^{2+} and Fe^{2+} | Fe

23. $C_2H_2 + \dfrac{5}{2}O_2 \rightarrow 2CO_2 + H_2O$;

   $\Delta H = -310$ kcal

   $C+O_2 \rightarrow CO_2$; $\Delta H = -94$ kcal

   $H_2+\dfrac{1}{2}O_2 \rightarrow H_2O$; $\Delta H = -68$ kcal

On the basis of the above equations, ΔH_f enthalpy of form ation of C_2H_2 will be

    a   -148 kcal   b +54 kcal

    c   -54 kcal   d +80 kcal

24. $I_2s \rightleftharpoons I_2g$; $\Delta H = +40$ kcal, $\Delta S = 80$ cal. The sublimation point of I_2s will be

    a 100 ^0C b 127 ^0C

    c 227 ^0C d 500 ^0C

25. If 0.1 M solutions of each electrolyte are taken and if all electrolytes are completely dissociated, then whose boiling point will be highest?

    a Glucose   b KCL

    c BaCL$_2$ d K$_4$[FeCN$_6$]

26. A solid metal has ccp or fcc structure. The relation of side of cube a and redius of atom r will be

    a a=2r   b a=2 $2\sqrt{2}$ r

    c a= $\frac{4}{\sqrt{3}}$ r   d a= $\sqrt{\frac{3}{2}}$ r

27. Hydrogen is prepared on large scale for industrial use

    a by Zn+H$_2$SO$_4$ b by Al+NaOH

    c by Na+C$_2$H$_5$OH   d from water gas

28. Which of the following properties of lithium does not show diagonal relationship with magnesium ?

    a Formation of Li$^+$ ion

    b Formation of L i$_3$N

    c Solubility of LiHCO$_3$

    d Thermal decomposition of Li$_2$CO$_3$

29. Which of the following carbonates decomposes at lowest temperature?

    a MgCO$_3$ b CaCO$_3$

    c SrCO$_3$ d BaCO$_3$

30. In which of the following pairs both molecules do not possess same type of hybridization?

a CH_4 and H_2O b PCL_5 and SF_4

c SF_6 and XeF_4 d BCL_3 and NCL_3

31. If H—X bond length is 2.00 $\overset{\circ}{A}$ and H—X bond has dipole moment 5.12×10^{-30} C-m,the percentage of ionic character in the molecule will be

a 10%   b 16%   c 18%   d 20%

32. i H —C—H angle in CH_4

ii CL —B—CL angle in BCL_3

iii F —I—F angle in IF_7 in a plane

iv I —I—I angle in I_3^-

Increasing order of above bond angles is

a   i<ii<iii<iv
b   ii<i<iii<iv
c   iii<i<ii<iv
d   iv<ii<i<iii

33. According to molecular orbital theory, bond order in increasing order will be

a $O_2^{2+} < O_2 < O_2^- < O_2^{2-}$

b $O_2^{2-} < O_2^- < O_2 < O_2^{2+}$

c $O_2 < O_2^{2-} < O_2^- < O_2^{2+}$

d $O_2 < O_2^{2+} O_2^- < O_2^{2-}$

34. Correct order electron affinities of halogens is

a F>CL>Br>I   b I>Br>CL>F

c CL>F>I>Br   d CL>F>Br>I

35. Atomic radii of Ti, Zr and Hf vary

a Ti>Zr>Hf   b Ti<Zr<Hf

c Ti <Hf<Zr   d Ti<Zr=HF

36. If $NO_2N_2O_4$ is dissolved in NaOH,we get solution of

a NaNO$_2$

b NaNO$_3$

c mixture of NaNO$_2$ and NaNO$_3$

d NaNO$_4$

37. A gas that religts glowing splinter,is

a H$_2$ b O$_2$

c N$_2$ d NO$_2$

38. A white-coloured inorganic compound, on heating,gives a gas which turns lime water milky and residue is left which is yellow when hot and turns white and cooling. The compound is

a pbNO$_{3\,2}$ b pbCO$_3$

c BaCO$_3$ d ZnCO$_3$

39. Buckminster-fullerebe is a variety of

a boron   b carbon

c ammonia   d fluorine

40. What will be the compound if two valencies of carbonyl group are satisfied by two alkyl groups?

a Aldehyde   b Ketone

c Acid   d Acidic anhydride

41. 2-chloro-3-methylbutane is treated with sodium in enerial solution,then it will give

a 2,4 -dimethylhexane

b 3,5 - dimethylhexane

c 2,3,4,5 -tetramethylhexane

d 2,6 -dimethyloctane

42. C$_2$H$_5$CL+aq NaOH → C$_2$H$_5$OH + NaCL; this reaction is

a electrphilic substitution of I order

b electrophilic substitution of II order

c   nucleophilic substitution of I order

d nucleophilic substitution of II order

43. Which of the following does not contain chiral carbon atom?

   a Lactic acid   b 2   -chlorobutanoic acid

   c Tartaric acid d   Succinic acid
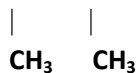
44. An organic on reuctive ozonolysis produces

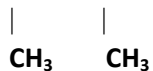   i acetaldehyde

   ii acetone

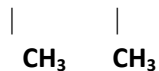   iii 2 -methylprpane-1.3-dial

   The formula of alkadiene will be

a $CH_3C = CHCHCH = CHCH_3$
           | |
          CH_3 CH_3

b $CH_3CHCH = CCH = CHCH_3$
         | |
        CH_3 CH_3

c $CH_3C = CHCHC = CHCH_3$
          | |
         CH_3 CH_3

d $CH_3CH_2CHCH = CHC = CH_2$
          | |
          CH_3 CH_3

45. Which of the following acids will have lowest value of pK_a ?

    a CH $_3CH_2COOH$ b CH $_3CHCOOH$
                                |

                                Br

    c CH $_3CHCOOH$ d FCH $_2CH_2COOH$

            |

         F

46. Which of the following will not respond to iodoform test ?

    a Ethyl alcohol   b propanol -2

c   Propanol -1   d   Ethanal

47. The strongest ortho/para directing group is

    a $- NH_2$ b $- CH_3$

    c $- CL$ d $- C_2H_5$

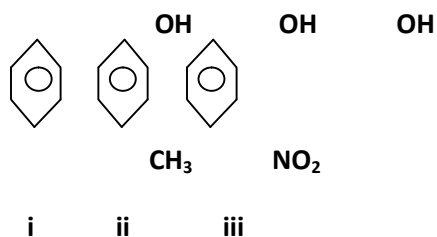48. Which of the following reaction can be used to change benzaldehyde to cinnamic acid?

    a perkin r eaction   b Knoevenagle reaction

    c Reformatsky reaction   d Benzoin condensation

49. Which of the following is strongest base ?

    a C $_6H_5NH_2$ b p - NO_2 $-C_6H_4NH_2$

    c m -NO_2 $- C_6H_4NH_2$ d $C_6H_5CH_2NH_2$

50. Correct acidic order of the following compounds is

OH   OH   OH

CH₃   NO₂

i   ii   iii

    a   I>ii>iii
    b   Iii>i>ii
    c   Ii>iii>i
    d   1>iii>ii