These questions are multiple-choice questions that ask you to select only **one** answer choice from a list of four choices. Each correct answer gives you one point.

CHEMISTRY

31. At a certain temperature, 7.0×10^{-4} mol $MgSO_4$ is present in 100 mL of solution. The concentration of the Mg^{2+} cations in this solution is

    A. 7.0×10^{-4} M
    B. 7.0×10^{-5} M
    C. 7.0×10^{-3} M
    D. 7.0×10^{-6} M

32. What is the conjugate base of $H_2PO_4^-$?

    A. OH^-
    B. PO_4^{3-}
    C. HPO_4^{2-}
    D. H_3PO_4

33. Which three numbers a, b and c are required to balance the equation:
    a $Li_{(s)}$ + b $O_{2\ (g)}$ → c $Li_2O_{\ (s)}$

    A. a-2, b-1, c-2
    B. a-4, b-1, c-2
    C. a-4, b-2, c-1
    D. a-2, b-2, c-1

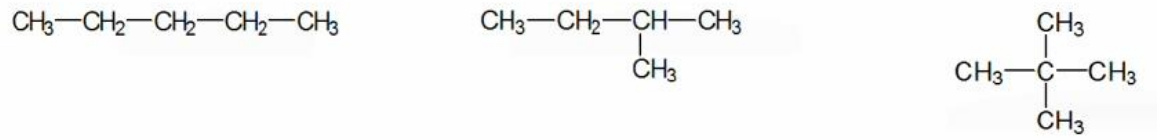
34. 80 g of calcium reacts with 150 g of chlorine to form 204 g of calcium chloride according to the reaction: $Ca_{(s)} + Cl_{2\ (g)} \rightarrow CaCl_{2\ (s)}$
    Given the relative atomic masses (Ar: Ca = 40 and Cl = 35.5) calculate the reaction yield.

    A. 74.5%
    B. 87.9%
    C. 91.9%
    D. 97.5%

35. The following is a list of selected standard reduction potentials:
    $Cd^{2+}_{(aq)} + 2\ e^- \rightarrow Cd_{\ (s)}$ $\quad E^0 = -0.40$ V
    $Zn^{2+}_{(aq)} + 2\ e^- \rightarrow Zn_{\ (s)}$ $\quad E^0 = -0.76$ V
    $Ni^{2+}_{(aq)} + 2\ e^- \rightarrow Ni_{\ (s)}$ $\quad E^0 = -0.23$ V
    Which of the following species is the best oxidizing agent?

    A. $Zn^{2+}_{(aq)}$
    B. $Cd_{\ (s)}$
    C. $Zn_{\ (s)}$
    D. $Ni^{2+}_{(aq)}$

36. Compounds given below are:



A. enantiomers
B. structural isomers
C. conformational isomers
D. *cis-trans* isomers

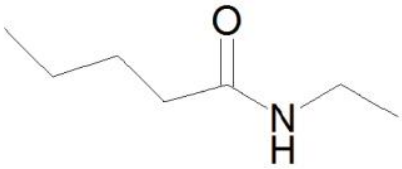
37. The type of alcohol in beverages such as wine, beer, and vodka is:

A. ethyl alcohol (ethanol)
B. isopropyl alcohol (isopropanol)
C. methyl alcohol (methanol)
D. ethylene glycol (ethane-1,2-diol)

38. A primary amine has
A. three carbon atoms attached to the nitrogen.
B. two carbon atoms attached to the nitrogen.
C. one carbon atom attached to the nitrogen.
D. four carbon atoms attached to the nitrogen.

39. Which of the following has the largest mass of carbon per gram?
A. H_2CO_3
B. CH_3CO_2H
C. CH_3OH
D. CH_3CH_2OH

40. The name of the chemical compound below is:



A. N-ethylpentylamine
B. N-pentylethanamide
C. N-ethylpentanamide
D. N-isopropylpentanamide