1. The substance H_2SO_3 is considered

   A. a weak Arrhenius acid.
   B. a strong Arrhenius acid.
   C. a strong Arrhenius base.
   D. a neutral compound.
   E. a weak Arrhenius base.

2. The substance NH_3 is considered

   A. a weak acid.
   B. a weak base.
   C. a strong acid.
   D. a strong base.
   E. a neutral compound.

3. Select the strongest acid from the following list.

   A. $HBrO_4$
   B. $HClO$
   C. $HBrO_2$
   D. $HBrO$
   E. HIO

4. Which of the following aqueous systems has the highest pH?

   A. 0.1 *M* HA, pK_a = 11.89
   B. 0.1 *M* HMO, pK_a = 8.23
   C. 0.1 *M* HA, pK_a = 4.55
   D. 0.1 *M* HBO, pK_a = 2.43
   E. pure water

5. What is the pH of a 0.20 *M* HCl solution?

   A. < 0
   B. 0.70
   C. 1.61
   D. 12.39
   E. 13.30

6. What is the pH of a 0.0035 *M* KOH solution?

   A. 2.46
   B. 5.65
   C. 8.35
   D. 11.54
   E. None of these choices is correct.

7. Butyric acid is responsible for the odor in rancid butter. A solution of 0.25 M butyric acid has a pH of 2.71. What is the K_a for the acid?

   A. 0.36
   B. 2.4×10^{-2}
   C. 7.8×10^{-3}
   D. 1.5×10^{-5}
   E. None of these choices is correct.

8. Farmers who raise cotton once used arsenic acid, H_3AsO_4, as a defoliant at harvest time. Arsenic acid is a polyprotic acid with $K_1 = 2.5 \times 10^{-4}$, $K_2 = 5.6 \times 10^{-8}$, and $K_3 = 3 \times 10^{-13}$. What is the pH of a 0.500 *M* solution of arsenic acid?

   A. 0.85
   B. 1.96
   C. 3.90
   D. 4.51
   E. None of these choices is correct.

9. What is the pH of a 0.0100 M sodium benzoate solution? K_b ($C_7H_5O_2^-$) = 1.5×10^{-10}

   A. 0.38
   B. 5.91
   C. 8.09
   D. 9.82
   E. 13.62

10. Iodine trichloride, ICl_3, will react with a chloride ion to form ICl_4^-. Which species, if any, acts as a Lewis acid in this reaction?

    A. ICl_4^-
    B. ICl_4
    C. Cl^-
    D. the solvent
    E. None of the species acts as a Lewis acid in this reaction.