



- Which of the following solutions has the highest pH?
  - 10 M  $\text{HNO}_3$
  - 0.010 M  $\text{KOH}$
  - 0.010 M  $\text{Ca}(\text{OH})_2$
  - 0.10 M  $\text{HNO}_3$
- Indicate which of the following salts will form an acidic solution when dissolved in water:
  - $\text{KCl}$
  - $\text{NaNO}_2$
  - $\text{NH}_4\text{NO}_3$
  - None of the above, as they are all, salts and solutions, neutral.
- Indicate which of the following salts will form a basic solution when dissolved in water:
  - $\text{NaCl}$
  - $\text{KNO}_2$
  - $\text{NaNO}_3$
  - $\text{CH}_3\text{COO Na}$
- The pH of a 0.50 M solution of a given acid, HA, is pH = 5.20. Calculate the acidic equilibrium constant,  $K_a$  of HA.
  - $3.98 \times 10^{-11}$
  - $6.3 \times 10^{-6}$
  - $8.85 \times 10^{-10}$
  - None of the above
- Which of the following values represents the weakest acid?
  - $\text{p}K_a = 2.05$
  - $\text{p}K_a = 8.10$
  - $K_a = 1.8 \times 10^{-4}$
  - $K_a = 6.8 \times 10^{-5}$
- What is the pH of a 0.5 M solution of  $\text{NaCN}$ ? [ $K_a(\text{HCN}) = 4.9 \times 10^{-10}$ ]
  - 2.5
  - 7.0
  - 4.7
  - 9.3
- Calculate the pH of a solution containing 0.15 mole of  $\text{NH}_4\text{Cl}$  and 0.20 mole of  $\text{NH}_4\text{OH}$  per litre.  $K_b(\text{NH}_4\text{OH}) = 1.85 \times 10^{-5}$ .
  - 4.61
  - 7.00
  - 4.73
  - 9.39
- Given a solution with a pH = 4.37, calculate the hydroxide ion concentration.
  - $1.00 \times 10^{-14}$  M
  - $4.25 \times 10^{-5}$  M
  - $2.34 \times 10^{-10}$  M
  - $9.63 \times 10^{-10}$  M