Exam

Name_____

1) A 0.15 M aqueous solution of the weak acid HA at 25.0 °C has a pH of 5.35. The value of K_a for HA is _____. 1) _____

A) 7.1×10^{-9}
B) 1.4×10^{-10}
C) 3.3×10^{4}
D) 3.0×10^{-5}
E) 1.8×10^{-5}

2) The conjugate base of HSO_4^- is 2) _____

A) H_2SO_4 B) OH^- C) SO_4^{2-} D) HSO_4^+ E) $H_3SO_4^+$

3) What is the pH of an aqueous solution at 25.0 °C in which $[H^+]$ is 0.00250 M? 3) _____

A) 2.60 B) 3.40 C) 2.25 D) -3.40 E) -2.60

4) The pH of a 0.10 M solution of a weak base is 9.82. What is the K_b for this base? 4) _____

A) 2.0×10^{-5} B) 2.1×10^{-4} C) 6.6×10^{-4} D) 8.8×10^{-8} E) 4.3×10^{-8}

5) What is the concentration (in M) of hydroxide ions in a solution at 25.0 °C with pH = 4.282? 5) _____

A) 4.28
B) 1.91×10^{-10}
C) 9.72
D) 1.66×10^{4}
E) 5.22×10^{-5}

6) The acid-dissociation constants of sulfurous acid (H_2SO_3) are $K_{a1} = 1.7 \times 10^{-2}$ and $K_{a2} = 6.4 \times 10^{-8}$ at 25.0 °C. Calculate the pH of a 0.163 M aqueous solution of sulfurous acid. 6) _____

A) 1.4 B) 4.5 C) 1.8 D) 7.2 E) 1.3

7) The K_a of hypochlorous acid (HClO) is 3.00×10^{-8} at 25.0 °C. Calculate the pH of a 0.0385 M hypochlorous acid solution. 7) _____

A) -1.41 B) 1.41 C) 4.47 D) 7.52 E) 8.94

8) What is the conjugate acid of NH_3? 8) _____

A) NH_2^+ B) NH_3^+ C) NH_4^+ D) NH_4OH E) NH_3

9) The pH of a 0.55 M aqueous solution of hypobromous acid, HBrO, at 25.0 °C is 4.48. What is the value of K_a for HBrO? 9) _____

A) 2.0×10^{-9} B) 3.3×10^{-5} C) 1.1×10^{-9} D) 3.0×10^{4} E) 6.0×10^{-5}

10) The acid-dissociation constants of phosphoric acid (H_3PO_4) are $K_{a1} = 7.5 \times 10^{-3}$, $K_{a2} = 6.2 \times 10^{-8}$, and $K_{a3} = 4.2 \times 10^{-13}$ at 25.0 °C. What is the molar concentration of phosphate ion in a 2.5 M aqueous solution of phosphoric acid? 10) _____

A) 8.2×10^{-9}
B) 9.1×10^{-5}
C) 0.13
D) 2.5×10^{-5}
E) 2.0×10^{-19}

11) The K_a for formic acid (HCO_2H) is 1.8×10^{-4}. What is the pH of a 0.35 M aqueous solution of sodium formate ($NaHCO_2$)? 11) _____

A) 3.3 B) 5.4 C) 11 D) 4.2 E) 8.6