

Name: _____

Period: _____

Seat#: _____

Directions: Show all work. Box your final answer.

- 1) Calculate the equilibrium constant, K_{neut} for the neutralization of hydrocyanic acid by ammonia: 0.72



K_a for hydrocyanic acid = 4.0×10^{-10} at 25°C , K_b for ammonia = 1.8×10^{-5} at 25°C

- 2) If exactly 50 mL of a 0.050M solution of hydrochloric acid is added to exactly 50 mL of 0.050M ammonia, what is the pH of the resulting solution? 5.43

- 3) a) What is the pH of 100 mL of pure water at 25°C ? Use the K_w to show how this is true. 7.0

- b) What would the pH of this 100 mL water sample be if 0.10 mL of 12M HCl was added to it? (Assume the volume doesn't change). 1.962

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c) Calculate the pH of a buffer solution composed of 0.20M ammonia and 0.20M ammonium chloride.
9.26

d) Calculate the pH of 100 mL of this buffer solution if 0.10mL of 12M hydrochloric acid is added to it.
(Assume the volume doesn't change). 9.2

4) A solution contains KH_2PO_4 and K_2HPO_4 and has a pH of 7.10. What is the mole ratio of K_2HPO_4 to KH_2PO_4 ? $K_a = 6.17 \times 10^{-8}$ 0.776 : 1