

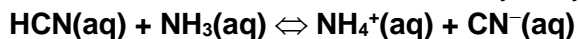
Name: _____

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). 1.92

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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