

Name: \_\_\_\_\_ Due Date: November 1, 2011 (Tuesday)

Show all work. **You are only allowed to work alone, but may see me.**

1. (4 Pts) Determine the pH of the solution that results from the mixing of 80.0 mL of 0.100 M NaOH, 94.0 mL of 0.0500 M KOH, 42.5 mL of 0.075 M HCl, 37.0 mL of 0.065 M HNO<sub>3</sub>, and 2.00 quarts of distilled water.

2. Calculate the pH of a titration of 50.00 mL of 0.100 M Phenylacetic acid (You may look up the formula if you need it),  $K_a = 4.9 \times 10^{-5}$ , with 0.100 M NaOH at the following points: **SHOW ALL WORK IN NEAT DETAIL ON A SEPARATE PAGE.**

(Be sure to write chemical equations and  $K_a$  or  $K_b$  expressions when needed.)

- a. (4 Pts) Before any NaOH is added.
- b. (4 Pts) After 14.7 mL of NaOH are added.
- c. (4 Pts) After 25.00 mL of NaOH are added.
- d. (4 Pts) After 50.00 mL of NaOH are added.
- e. (4 Pts) After 52.00 mL of NaOH are added.
- f. (1 Pt) What is the  $pK_a$  of the acid (show calculation)?