

**CHEM 1202 - Homework # 5**

Name: \_\_\_\_\_

**Acids & Bases # 1**

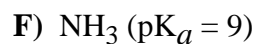
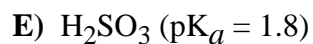
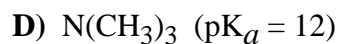
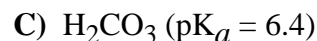
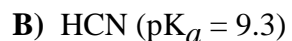
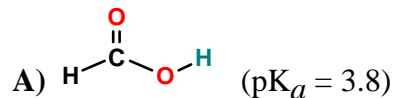
Signature: \_\_\_\_\_

**Due Thursday, March 19 (by 2:00 PM)**

Group Name: \_\_\_\_\_

Check the box to the right if you want your graded homework to be placed out in the public rack outside Prof. Stanley's office. Otherwise you will have to pick up your homework from Prof. Stanley in person:

1. (3 pts) Consider the following weak acids and bases and their  $pK_a$  values:



Which compound is the strongest acid (use letter) ? \_\_\_\_\_

Which compound is the strongest base (use letter) ? \_\_\_\_\_

Which compound has the strongest conjugate base (use letter) ? \_\_\_\_\_

2. (5 pts) What are the pH's for the following solutions?

a)  $0.1 \text{ M HBr} =$

b)  $10 \text{ M H}_2\text{SO}_4 =$

c)  $1 \times 10^{-10} \text{ M HNO}_3 =$

d)  $0.1 \text{ M NaOH} =$

e)  $10 \text{ M CsOH} =$

3. (4 pts) What is the  $pK_a$  value of a  $0.1 \text{ M}$  solution of palmetic acid (HA) that has a pH of 5? Clearly show all your work and put a box around your answer.

4. (3 pts) Calculate the pH of a  $0.01 \text{ M}$  solution of acid that has a  $pK_a$  of 6.0. Clearly show all your work and put a box around your answer.

5. (5 pts) What is the pH of a 0.1 M solution of the base ethyl amine ( $\text{CH}_3\text{CH}_2\text{NH}_2$ ).  $K_a = 1 \times 10^{-11}$  Clearly show all your work and put a box around your answer.

6. (5 pts) What is the  $K_b$  of a 0.01 M solution of a base that has a pH of 10? Clearly show all your work and put a box around your answer.

7. (5 pts) Which of the following acids is the strongest based on its structure and atoms present? Clearly discuss your reasoning.

