## BONUS QUIZ                                      Numerical Analysis

Name: _____

Date: _____                    **Friday January 30**
Time Begun: _____                Ron Buckmire
Time Ended: _____

**Topic :** Practice with finite precision arithmetic

The idea behind this quiz is for you to experience the propagation of error involved with finite-precision computations.

## Reality Check:

EXPECTED SCORE : _____/**10**          ACTUAL SCORE : _____/**10**

## Instructions:

0. Please look for a hint on this quiz posted to `faculty.oxy.edu/ron/math/370/09/`

1. Once you open the quiz, you have **30 minutes** to complete, please record your start time and end time at the top of this sheet.

2. You may use the book or any of your class notes. You must work alone.

3. If you use your own paper, please staple it to the quiz before coming to class. If you don't have a stapler, buy one. QUIZZES WITH UNSTAPLED SHEETS WILL NOT BE GRADED.

4. After completing the quiz, sign the pledge below stating on your honor that you have adhered to these rules.

5. Your solutions must have enough details such that an impartial observer can read your work and determine HOW you came up with your solution.

6. Relax and enjoy...

7. **This quiz is due on Monday February 3**, in class. NO LATE OR UNSTAPLED QUIZZES WILL BE ACCEPTED.

**Pledge:** I, _____, pledge my honor as a human being and Occidental student, that I have followed all the rules above to the letter and in spirit.

**1.** Evaluate each of the following expressions using 5-digit finite precision arithmetic, of the form $0.d_1 d_2 d_3 d_4 d_5 \times 10^n$ as well as the corresponding "exact" value.

**a.** $a = \dfrac{1}{5} \oplus \dfrac{5}{7}$ and $A = \dfrac{1}{5} + \dfrac{5}{7}$

**b.** $b = \dfrac{1}{5} \ominus \dfrac{5}{7}$ and $B = \dfrac{1}{5} - \dfrac{5}{7}$

**c.** $c = \dfrac{1}{5} \otimes \dfrac{5}{7}$ and $C = \dfrac{1}{5} \times \dfrac{5}{7}$

**d.** $d = \dfrac{1}{5} \oslash \dfrac{5}{7}$ and $D = \dfrac{1}{5} \div \dfrac{5}{7}$

**e.** Compute the relative and absolute errors of $a$ with $A$, $b$ with $B$, $c$ with $C$ and $d$ with $D$, respectively.