Score: **/20**

CS 222
Spring 2021   Name: _____

Homework 2: Permutations & Combinations

Due date: Friday 2/12   Submit the assignment via Canvas Assignments. Upload homework as one pdf document. A scanner app like Cam Scanner will make this possible.

Print and write work on this worksheet. Write **clearly** and show **all** work for full credit.

1. Jamie is joining a music club. As part of her introductory package, she can choose from 12 rock selections, 10 alternative selections, 7 country selections and 5 classical selections. If Jamie chooses one selection from each category, how many ways can she choose her introductory package? (2 points)

2. How many distinct four-letter secret codes can be formed if the first letter must be an S or T? No repetition allowed. (2 points)

3. In a contest in which 10 contestants are entered, in how many ways can the 4 *distinct* prizes be awarded? (Meaning there is a different prize for 1st, 2nd, 3rd, and 4th.) (2 points)

4. In how many distinct ways can the letters in MISSISSIPPI be arranged? (2 points)

5. Use the binomial theorem to expand $(x + y)^7$ (4 points)

6. For the following problems, consider a group of 50 students. There are 8 Computer Engineering (CE) majors, 12 Computer Science (CS) majors, 20 Electrical Engineering (EE) majors, and 10 Software Engineering (SE) majors. There are no dual major students.

   a. The department chair will pay for 16 students to go to a conference. In how many ways can the 16 students be selected if exactly 4 are selected from each major? (3 points)

   b. 8 of the students are lined up from left to right. In how many ways can this be done when we consider their individual names, not their majors? (2 points)

   c. 8 of the students are lined up from left to right. In how many ways can this be done if we consider only their majors, and not their names? (3 points)