

## CISC-102 FALL 2017

### HOMEWORK 8

Please work on these problems and be prepared to share your solutions with classmates in class next week. Assignments will **not** be collected for grading.

#### READINGS

Read sections 5.3, 5.4, 5.5 5.6 and 5.7 of *Schaum's Outline of Discrete Mathematics*.  
Read section 3.1 and 3.2 of *Discrete Mathematics Elementary and Beyond*.

#### PROBLEMS

- (1) What is the number of ways to colour  $n$  identical objects with 3 colours? What is the number of ways to colour  $n$  identical objects with 3 colours so that each colour is used at least once?
- (2) How many different strings can you make using the letters TIMBITS?
- (3) How many 5 card hands are there (unordered selection from a standard 52 card deck) that consist of a single pair of the same value, and three other cards of different values? Two possible examples are:

$2\heartsuit, 2\diamond, 7\clubsuit, 9\heartsuit$  and  $A\heartsuit, A\clubsuit, 4\diamond, 6\diamond 3\heartsuit$

- (4) From 100 used cars sitting on a lot, 20 are to be selected for a test designed to check safety requirements. These 20 cars will be returned to the lot, and again 20 will be selected for testing for emission standards.
  - (a) In how many ways can the cars be selected for safety requirement testing?
  - (b) In how many ways can the cars be selected for emission standards testing?
  - (c) In how many different ways can the cars be selected for both tests?
  - (d) In how many ways can the cars be selected for both tests if exactly 5 cars must be tested for safety and emission?