# **Section 7 Assignment (84 points) – Counting**

To receive credit, you must either show your work on the worksheet or explain how you got the answer. 69/88

1. (5 points) Your zyBook password consists of 3 upper-case letters followed by 4 lower-case letters followed by seven digits. How many different passwords are possible? *(Note: leave answer in exponent or factorial form)*

26^3\*26^4\*10^7

1. (15 points) If the password can contain upper/lower case letters, digits, or any of eight special symbols: *(Note: leave answers in exponent or simplified factorial form)*
   1. (5 pts) How many different 8-character passwords are possible?

70^8 = 5.764801×10^14

1. (5 pts) How many passwords 9, 10, or 11-character passwords are possible?

70^9 + 70^10 + 70^11 = 2.005977804×10^20

1. (5 pts) How many different 8-character passwords are possible if characters cannot be repeated?

70\*69\*68\*67\*66\*65\*64\*63 = 3.806349491×10^14

1. (12 points) Compute each of the following: *(Note: to make your life [and programs] easier, simplify factorial fractions before! calculating answer)*
   1. (3 pts) **P(11, 11) - no repeats**

11! = 39916800

* 1. (3 pts) P(11, 1) **- no repeats**

11!/(11-1)! = 11!/10! = 11

* 1. (3 pts) P(n, n-3) **- no repeats** *(Note: leave in simplified factorial form)*

n!/(n-(n-3))! = n!/3! = n!/-6 I simplified it too far but its the same answer

* 1. (3 pts) P(15, 7) – **repeats allowed**

**15^7 =** 170859375

1. (14 points) Compute each of the following: *(Note: to make your life [and programs] easier, simplify factorial fractions before! calculating answer)*
   1. (3 pts) C(11, 2) **- no repeats**

11!/2!(11-2)! = 110/2 = 55

* 1. (3 pts) C(7, 7) **- no repeats**

7!/7!(7-7)! = 1/1 = 1

* 1. (4 pts) C(n+2, n-1) - no repeats (Note: leave in simplified factorial form)

(n+2)/(n-1)!((n+2)-(n-1))! = n+2/(n-1)!3! = n+2/6n-6

I messed up the simplification and left out the ! After (n+2)

* 1. (4 pts) C(5, 3) **- repeats allowed**

5!/3!(5-3)! = 5\*4/2\*1 = 10

I used the wrong formula here

1. (10 points) Find the number of permutations of A taken r at a time
   1. (5 pts) if repetition is allowed: A = (1, 2, 3, 4, 5, 6, 7, 8), r = 5

8^5 = 32768

* 1. (5 pts) if repetition is NOT allowed: A = (1, 2, 3, 4, 5, 6, 7, 8), r = 5

8!/(8-5)! = 8!/3! = 9\*8\*7\*6\*5\*4 = 6720

1. (8 points) If there are three routes from Ogden to Salt Lake, four routes from Salt Lake to Park City, and two routes from Ogden to Park City:
   1. (4 pts) How many ways are there to travel from Ogden to Park City?

4\*3 +2 = 14

* 1. (4 pts) How many ways are there to travel from Salt Lake to Ogden?

3 + 2\*4 = 11

1. (20 points) Your ice tray contains 12 green cubes and 6 pink cubes.
   1. (6 pts) How many ways can we select 7 cubes?

18!/7!(18-7)! = 31824

* 1. (6 pts) How many ways can 5 cubes be selected so that all 5 are pink?

6!/5!(6-5)! = 6!/5! = 6

* 1. (8 pts) How many ways can we select 4 cubes, so they are not all green or all pink?

18!/4!(18-4)! = 3060

6!/4!(6-4)! = 15

12!/4!(12-4)! = 495

3060 – 15 – 495 = 2586

I used the wrong formula here