## 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.

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)

$$26^3 * 26^4 * 10^7$$

- 2. (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)
  - a. (5 pts) How many different 8-character passwords are possible?

$$70^{8}$$

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

$$70^9 + 70^{10} + 70^{11}$$

- b. (5 pts) How many different 8-character passwords are possible if characters cannot be repeated?
  - = 70! / 62!
  - = 380,634,949,094,400
- 3. (12 points) Compute each of the following: (Note: to make your life [and programs] easier, simplify factorial fractions before! calculating answer)
  - = 11!
  - =39,916,800
  - a. (3 pts) P(11, 1) no repeats
    - = 11! / 10!
    - = 11

b. (3 pts) 
$$P(n, n-3)$$
 - no repeats (Note: leave in simplified factorial form)  
=  $n! / 3!$ 

c. 
$$(3 pts) P(15, 7)$$
 – repeats allowed

$$=15^{7}$$

4. (14 points) Compute each of the following: (Note: to make your life [and programs] easier, simplify factorial fractions before! calculating answer)

a. 
$$(3 pts) C(11, 2)$$
 - no repeats

$$= 55$$

b. 
$$(3 pts) C(7, 7)$$
 - no repeats

$$= 1$$

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

d. 
$$(4 pts) C(5, 3)$$
 - repeats allowed

5. (10 points) Find the number of permutations of A taken r at a time

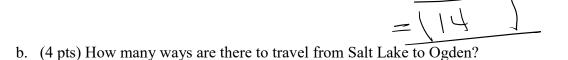
a. 
$$(5 pts)$$
 if repetition is allowed:  $A = (1, 2, 3, 4, 5, 6, 7, 8), r = 5$ 

$$= 32,768$$

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

$$=6,720$$

- 6. (12 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:
  - a. (4 pts) How many ways are there to travel from Ogden to Park City?



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

$$=31,824$$

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

= 6

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

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