Name	Test 1, Discrete II, Spring 2018
Directions: Complete each problem. Do not simplify answ not obvious what your final answer is, circle it.	ers, except on the very first problem. If it's
1) Calculate $\binom{6}{4}$ .	

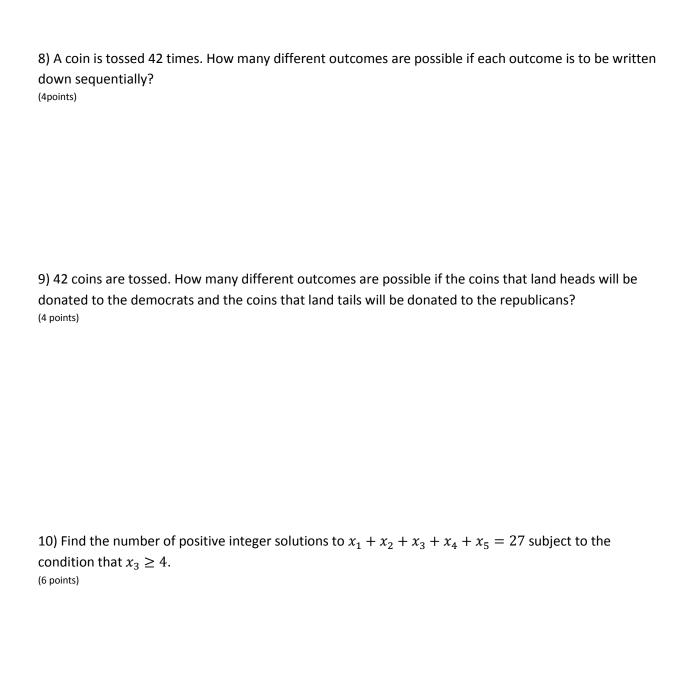
2) Given the set {1,4,5,6,7}, find the first seven permutations in lexicographic ordering. (7 points)

3) Suppose there are 12 roads from Conway to Little Rock and 5 roads from Little Rock to Hot Springs. How many round trips are there from Conway–Little Rock–Hot Springs–Little Rock–Conway that do not reverse the original route from Conway to Hot Springs?  (6 points)

4) At a certain age group, 10% of the population is infected by a disease. A test for infection is 99% accurate when you're infected, but only 95% accurate when you're not infected. If you take the test and it says you are infected, what is the probability that you are actually infected?

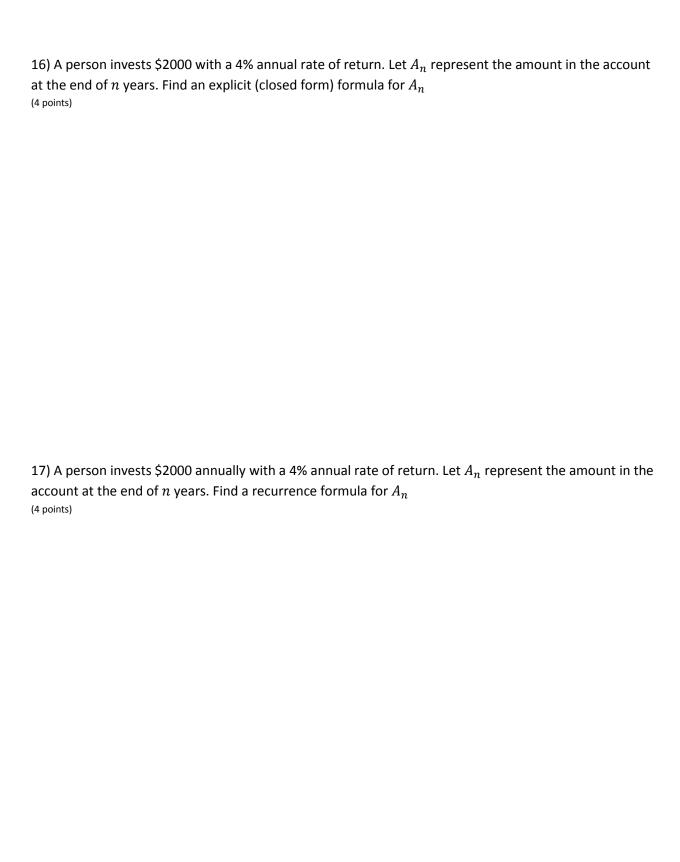
(6 points)

5) How many numbers are between 71 and 293, inclusive? (4 points)
6) Determine how many strings can be formed by ordering the ten letters ABCDEFGHIJ that contain the substrings AB and EC? (4 points)
7) Find the coefficient of $w^2x^3y^2z^5$ in $(2w+x+3y+z)^{12}$ . (6 points)





13) A fair six-sided die is rolled. What is the probability of an even number? (4 points)
14) A weighted die is rolled. What is the probability of an even number? It is weighted so that 2, 4, and 6 are equality likely to appear. 1, 3, and 5 are also equally likely to appear, but 1 is three times as likely as 2 to appear.  (4 points)
15) Among 100 people, 10 of them have a certain disease. If you select 6 people at random, what is the probability that none of them are infected?  (6 points)



18) Let  $a_n=6a_{n-1}-8a_{n-2}$  with the initial conditions  $a_0=0$  and  $a_1=10$ . Solve this recurrence relation to find an explicit formula for  $a_n$ .