Name:_____

Math 150 Fall 2014 Test 3

There are eighteen questions total with point values given below. Where indicated, write your answer in the space provided. Good luck!

1. _____ An auto manufacturer produces 6 models, each available in 8 different colors, with 4 different upholstery fabrics, and 3 interior colors. How many varieties of the auto are available? (4 points)

  (a) 21   (b) 21!   (c) 72   (d) 576

2. _____ The Greek alphabet has 24 letters. How many ways can one name a fraternity using 3 Greek letters (with no repeats)? (5 points)

  (a) 12,144   (b) 6   (c) 2024   (d) 13,824

3. _____ The college football team has 11 seniors. The team needs to elect a group of 4 senior co-captains. How many different 4-person groups of co-captains are possible? (4 points)

  (a) 7920   (b) 330   (c) 24   (d) 11!

4. _____ If 6 people line up for a picture, what is the probability that Fred (one of the six) will be first in line? (4 points)

  (a) 1/720   (b) 1/6   (c) 5/6   (d) 719/720

5. _____ A Social Security number has 9 digits. How many Social Security numbers are possible? (Assume no restrictions.) (4 points)

  (a) 10!   (b) 10   (c) 10^9 (d) 9!

6. _____ The ski club has 8 women and 7 men. What is the probability that if the club elects 3 officers, all 3 of them will be women? (4 points)

  (a) 56/455   (b) 3/455   (c) 3/40320   (d) 336/2730

7. _____ If 3 of 9 computer monitors are broken, in how many ways can a sample of 4 include no broken monitors? (5 points)

  (a) 3024   (b) 30   (c) 360   (d) 15

8. _____ How many variations are possible for gold, silver, and bronze medalists in the 50-meter swimming race if there are 10 finalists? (4 points)

  (a) 720   (b) 10!   (c) 120   (d) 1000

9. _____ Which of the following probability distributions is not valid? (4 points)

(a)

x	1	2	3
$P(x)$	.3	.4	.3

(b)

x	5	10	15
$P(x)$	.3	-.2	.9

(c)

x	-1	0	1
$P(x)$	.25	.15	.60

(d)

x	10	20	30
$P(x)$	.95	0	.05

10. _____ The U.S. Senate Foreign Relations Committee in 2009 has 11 Democrats and 7 Republicans. A delegation of 5 people is to be selected to visit Iraq. What is the probability that the delegation will have at least one Democrat? (4 points)

  (a) 21/8568   (b) 385/8568   (c) 8547/8568   (d) 8183/8568

11. (10 points) Suppose you pay \$2 to roll a fair die. If you roll an even number, you get \$8 back. If you roll an odd number, you get \$0 back. What are your expected net winnings for this game?

(12-14) (15 points) Shirley is a shelf stocker at the local grocery store. She has 4 flavors of Edy's ice cream, 3 flavors of Breyer's ice cream, and 5 flavors of Ben and Jerry's ice cream. In how many distinguishable ways can she stock the shelves if

12. the ice creams can be arranged in any order?

13. ice creams from the same company are considered alike and have to be shelved together?

14. ice creams from the same company are considered alike and have to be shelved together, and the company names must be in alphabetical order?

15. (5 points) Fill in the missing value to make a valid probability distribution.

x	5	10	15	20	25	30
$P(x)$	.01	.09	.25	.45	.05	

16. (10 points) A multiple choice test has 10 questions. Each question has four answer choices. How many different keys are possible?

17. (10 points) If 3 of 9 computer monitors are broken, in how many ways can a sample of 4 include no broken monitors?

18. (10 points) The probability that a person with certain symptoms has hepatitis is .8. The blood test used to confirm this diagnosis gives positive results for 90% of people with the disease and 5% of those without the disease. What is the probability that an individual who has the symptoms and who reacts positively to the test actually has hepatitis?