

(20 pts) NAME (printed neatly): \_\_\_\_\_

Quiz Grade: \_\_\_\_\_

1. (56 pts – 8 pts each) Classify the following random variables  $X$  or  $Z$  by putting the proper letter choice in the blank.

**F** = Finite discrete, not binomial

**I** = Infinite discrete

**C** = Continuous, not known if normal

**B** = Binomial (type of finite discrete)

**N** = Normal (type of continuous)

**B** \_\_\_\_\_ Case 1: A company selects 12 employees to attend an efficiency course. On average 80% of those sent, pass the course. Let  $X$  be the number of employees that pass the course.

**N** \_\_\_\_\_ Case 2: The average height of Texas A&M softball players is normally distributed with a mean of 67.8 inches and a standard deviation of 2.587 inches. Let  $X$  be the average height of the Texas A&M softball players.

**I** \_\_\_\_\_ Case 3: Three fair dice are rolled until all three dice show the same number uppermost. Let  $X$  be the number rolls.

**F** \_\_\_\_\_ Case 4: A card is drawn, without replacement, until a face card (J, Q, and K) is drawn. Let  $X$  be the number of cards drawn.

**C** \_\_\_\_\_ Case 5: Let  $X$  be the number liters of water in the Fish Pond.

**B** \_\_\_\_\_ Case 6: Nine percent of popcorn kernels are royal blue in color. If 1200 popcorn kernels are chosen at random, let  $X$  be the number kernels that are royal blue.

**N** \_\_\_\_\_ Case 7: Let  $Z$  be the standard normal random variable.

2. (24 pts) A hurricane relief organization is hosting a fund-raising raffle. Two thousand tickets have been sold for \$20 each. There will be one first-place prize of \$4000, 5 second-place prizes of \$500 and 20 third-place prizes for \$50. What are the expected net winnings of a person who buys one ticket?

<u>Outcome</u>	<u>X</u>	<u>P(X)</u>
1st place	$4000 - 20 = 3980$	$\frac{1}{2000}$
2nd place	$500 - 20 = 480$	$\frac{5}{2000}$
3rd place	$50 - 20 = 30$	$\frac{20}{2000}$
Loser	$-20$	$\frac{1974}{2000}$

$$E(X) = 3980\left(\frac{1}{2000}\right) + 480\left(\frac{5}{2000}\right) + 30\left(\frac{20}{2000}\right) - 20\left(\frac{1974}{2000}\right) = -16.25$$

The expected net winnings of a person who buys one ticket is a **loss of \$16.25**.