STA 2023 REVIEW II – Chapters 4-5 (not all-inclusive)

1. True/False
   a) The standard deviation of the sampling distribution of the sample mean is always equal to the standard deviation of the population.
   b) The number of defective vending machines on a college campus is an example of a continuous random variable.
   c) Every normal distribution has a mean = 0 and standard deviation = 1.
   d) A binomial random variable is a discrete random variable.

2. Which of the following is a valid probability distribution?

   a)

x	p(x)
0	.30
1	.20
2	.40

   b)

x	p(x)
-3	.35
0	.65
3	-.10

   c)

x	p(x)
0	.36
3	.52
6	.22

   d)

x	p(x)
-8	.24
-4	.65
0	.11

3. In a study of the time college freshmen use to study each week, it is found that the mean time is 6.8 hours with a standard deviation of 2.5 hours. If 100 freshmen are randomly selected, what is the probability their mean weekly study time exceeds seven hours?

4. Suppose in a recent national election, 40% of the voters were men. If a random sample of 25 voters was selected, what is the probability that more than 10 but less than 20 were women?

5. A traffic study conducted at one point on an interstate highway shows that vehicle speeds are normally distributed with a mean speed of 63.5 miles per hour and a standard deviation of 4.8 mph.

   a) If a vehicle is randomly selected, what it the probability that its speed is between 55 and 65 mph?
   b) 60% of the speeds in the distribution exceed what value?

6. Find the mean and variance of the following probability distribution:

x	-9	1	4
p(x)	.3	.4	.3

KEY (brief answers provided; show all work on the exam)

1. F, F, F, T
2. d
3. .2119
4. .937
5. a) .5833 b) 62.3 mph
6. a) -1.1 b) 28.29