Q1 (12 pts) Circle the right answer.

1. Which of the following correctly describes a sample?

a. It is a subset of the population of interest b. Its summary measures are called statistics

c. Its summary measures are designated by Roman letters (such as x for sample mean)

d. All of the above

2. A list of commonly used parameters includes

a. sample mean x b. sample standard deviation c. All of above. d. None of the above

3. Using the standard normal table, the total probabilities to the right of $z = 2.0$ and to the left of $z = -2.0$ is

a. 0.0228 b. 0.4772 c. 0.9544 d. 0.0456

4. Given that Z is a standard normal random variable, $P(-1.2 \leq Z \leq 1.5)$ is

a. 0.8181 b. 0.4772 c. 0.3849 d. 0.5228

5. Given a normal distribution with a mean of 80 and a standard deviation of 20, an observation of $x = 50$ corresponds to a standard normal deviate

a. of $z = +1.5$ b. of $z = +3.0$ c. of $z = -1.5$ d. None of the above

6. The standard deviation of a binomial distribution for which $n = 50$ and $p = 0.15$ is:

a. 50.15 b. 7.082 c. 6.375 d. 2.525

7. Given a Poisson random variable x, where the average number of times an event occur in a certain period of time is 2.5, then $P(x = 0)$ is

a. 2.5 b. 0.0821 c. 1.5811 d. 0.40

8. The number of traffic accidents per day on a certain section of highway is thought to be Poisson distributed with a mean equal 2.19. Then the standard deviation of number of accidents is

a. 2.19 b. approximately 4.80 c. approximately 1.48 d. 3.14

Q2(8 pts) The number X of people entering the intensive care unit at a particular hospital on any one day has a Poisson probability distribution with mean equal to 5 people / day.

(a) What is the probability that the number of people entering the intensive care unit on a particular day is 2. What is it for less than or equal to 2.

(b) is it likely that X will exceed 10? Explain.

Q3(8 pts) State true or false

(1). If x denotes a continuous random variable, $P(x = c) = 0$ for every number c.

(2) The left half of the normal curve is slightly smaller than the right half.

(3) As a rule of thumb, if the sample size n is large relative to the population size N – in particular, if $n / N \geq 0.05$ – then the resulting experiment will not be binomial.

(4). Nonrandom samples can be described and also be used for making inferences.

(5). The publisher of a newspaper decides which articles will be submitted for the consideration of the Pulitzer Prize committee. This is an example of cluster sampling.

(6)Numerical descriptive measures calculated from a sample are called Statistics.

(7). The mean and variance of the Poisson distribution are equal.

(8) There are four ways of selecting a distinct, unordered sample of size $n = 2$ without replacement from a population of size $N = 4$.

Q4 (9 pts) Consider a binomial random variable with n = 8 and p = 0.7 Fill in the blanks in table below.

The problem	List values of X	Write the probability	Rewrite the probability	Find the probability
More than 3				
Exactly 3				
Three or less				

Q5 (7pts) A normal random variable x has standard deviation $\sigma = 2$ and an unknown mean μ . if the probability that X exceeds 7.5 is .8025, find μ .

Q6(8 pts) Use normal curve to approximate the probability that x= 8 , 9 or 10 for a binomial random variable with n= 20 and p = 0.5 . Compare this approximation with exact binomial probability.

Q7 (8 pts) for hyper geometric, p(x = k) =
A candy dish contain 5 blue and 3 red candies. A child reaches up and selects 3 candies with out looking.

(a) what is the probability that there are 2 blue and one red candy in the selection

(b) What is the probability that candies are all blue.