

**Q1****1 Point**

What is the variance of a Bernoulli distributed random variable with parameter  $p$  ?

- ☒  $p(1 - p)$
- ☐  $p$
- ☐  $p^2$
- ☐  $1 - p$

**Q2****1 Point**

The binomial distribution describes the number of successes in a fixed number of:

- ☐ Trials of a continuous random experiment
- ☒ Independent trials of a Bernoulli experiment
- ☐ Randomly chosen trials
- ☐ Dependent trials of any random experiment

**Q3****1 Point**

If the average test score in a class is 50 with a standard deviation of 10, what is the Z-score for a student who scored 70?

- ☐ 0.2
- ☒ 2
- ☐ 20
- ☐ 7

#### Q4

1 Point

The Central Limit Theorem is crucial for statistical analysis because:

- ☐ It guarantees that all distributions are symmetric
- ☒ It allows statisticians to make approximations using the normal distribution for large sample sizes even if the original data is not normally distributed
- ☐ It ensures that the median and mode of a sample are the same
- ☐ It asserts that all sample data are normally distributed

#### Q5

1 Point

How does the Law of Large Numbers differ from the Central Limit Theorem?

- ☒ The CLT states that the distribution of the sum (or average) of a large number of independent, identically distributed variables will be approximately normal, regardless of the original distribution of the variables. The LLN describes the convergence of the sample mean to the population mean
- ☐ The CLT focuses on small sample sizes, while the LLN is only valid for very large sample sizes
- ☐ The LLN describes the distribution of sample means, while the CLT describes the convergence of sample means to the population mean
- ☐ The LLN and CLT are effectively the same concept with different names

#### Q6

1 Point

Why might one want to approximate a binomial distribution with a normal distribution?

- ☐ Because the binomial distribution is always equivalent to the normal distribution
- ☐ To convert discrete data to continuous data
- ☒ To simplify complex binomial calculations
- ☐ Because binomial distributions are not reliable

**Q7****1 Point**

The shape of the chi-squared distribution:

- ☐ Remains the same regardless of the degrees of freedom
- ☐ Is symmetric
- ☐ Becomes more skewed as the degrees of freedom increase
- ☒ Becomes less skewed as the degrees of freedom increase

**Q8****1 Point**

Compared to the standard normal distribution, the t-distribution:

- ☒ has heavier tails
- ☐ Has a higher peak
- ☐ Has thinner tails
- ☐ Is always symmetric

**Q9****1 Point**

The degrees of freedom for the numerator and denominator in the F-distribution are associated with:

- ☒ The sample sizes of the two samples being compared
- ☐ The means of the two samples being compared
- ☐ The skewness of the two samples being compared
- ☐ The variances of the two samples being compared