ECO204 (Section 6)
EWU

Quiz-1
Fall - 2023

October 10, 2023

Name: _____

Student ID: _____

- *Please avoid all unethical behaviors (e.g., looking at others' solutions, asking others), if you are caught, then I will take your script and the exam will be cancelled then and there, so no mercy policy!*
- *The exam is worth* 18 *points, and total duration of the exam is* 20 *minutes.*

1. **True/False (9 points)** Write "T" if True and "F" if False.

   (a) (1 point) _____ Sample data points are always fixed and that is why we call it a random sample.

   (b) (1 point) _____ Estimator is always constant because we are calculating using a fixed sample.

   (c) (1 point) _____ If two probability distributions have different mean and variance, this means they are different distributions.

   (d) (1 point) _____ Normal distributions always have mean 0 and variance 1.

   (e) (1 point) _____ In Statistics we can have all possible information about Population and Sample is nothing but the full Population.

   (f) (1 point) _____ If we already know the true parameters (e.g., true mean and true variance), there is no need for *Statistical Inference*.

   (g) (1 point) _____ Central Limit Theorem (CLT) says regardless of the sample size n the sampling distribution of $\bar{X}_n$ will be always Normal.

   (h) (1 point) _____ If two Normal distributions have same mean this means they are same distributions.

   (i) (1 point) _____ Interval estimation problem is just like point estimation, where we have one possible guess for the unknown parameter.

2. **Short Questions (6 points)**

   (a) (4 points) Suppose we have an iid random sample of size 6 where all random variables follow normal distribution with same mean 10 and variance 36. In particular this means the distribution of $X_1, X_2, \ldots, X_6$, are all same and that is $\mathcal{N}(10, 36)$. Figure out the sampling distribution of $\bar{X}_n$. In other words, figure out $\bar{X}_n \sim ?$ What is the mean and the variance of $\bar{X}_n$, in other words $\mathbb{E}(\bar{X}_n)?$ and $\mathbb{V}(\bar{X}_n)?$

   (b) (2 points) If we have very large sample in the above problem, is there any additional benefit in this case?