

STA 304H1F-1003H Fall 2019

Assignment 1

Question 1. (15 marks)

We consider a population of $N = 5$ service-stations, labeled 1,2,3,4,5 with respective price of a litre of high-grade petrol in a certain month, $y_1 = 5.82$, $y_2 = 5.33$, $y_3 = 5.76$, $y_4 = 6.20$, $y_5 = 5.89$. Consider a simple random sample without replacement design with sample size $n = 3$. For your convenience, several parts of the following may be combined into a single table.

- (a) Find the values of the population parameters μ , the median, and the σ . List every possible sample of size $n = 3$. For each sample, what is the probability that it is the one selected? (6 marks)
- (b) What is the sampling distribution of \bar{y} ? (5 marks)
- (c) Find $\mathbf{E}(\bar{y})$, $\mathbf{V}(\bar{y})$, $\mathbf{Bias}(\bar{y})$ and $\mathbf{MSE}(\bar{y})$ (4 marks)