

Date: February 02, 201

DOUBLE SAMPLING

01. Following figure relates to a study of a variable y (in kg.) together with an auxiliary variables x (in ft.) :

Population size $(N) = 12908$, $\bar{y} = 782.5$, $\bar{x} = 88.4$, $S_y^2 = 45.387$, $S_x^2 = 39.228$ and $S_{yx} = 36.116$

First-phase sample size $(n') = 1528$ and the sample mean $(\bar{x}') = 85.7$ ft.

Second-phase sample size $(n) = 100$, the sample mean $(\bar{x}) = 86.99$ ft., $\bar{y} = 769.68$ kg and $b = 2.881$

- a) Find an estimate of the population mean of y by ratio method and the variance of the estimator. Also find the relative error of the estimate.
- b) Find an estimate of the population mean of y by the regression method and the variance of the estimator. Also find the relative error of the estimate.
- c) Hence find a relative measure of precision of one method with respect to the other.