Sampling Practical II

1)

The number of labors (in thousands) x and quantity of raw materials y (in lakhs of bales) are given for sample of five mills drawn by SRSWOR from a population of 20 mills with X=8830.

Jute mill	1	2	3	4	5
X	368	512	384	503	475
Y	31	31	33	29	38

Estimate the total amount of raw material consumed by 20 mills by
a) Sample mean estimator
b) Ratio estimator
c) Regression estimator
   Also compare estimated variance of these estimators.

2)

An experienced farmer make an eye estimate of the weight of the weight of peaches x_i on each tree on orchard of N=200 trees. He finds a total weight of X=11600 lb. The peaches are picked and weighed on the basis of SRSWOR of 10 trees with the following results;

Weight					Tree Number					
	1	2	3	4	5	6	7	8	9	10
Actual y_i	61	42	50	58	67	45	39	57	71	53
Estimate x_i	59	47	52	60	67	48	44	58	76	58

a) Obtain regression estimate of the total actual weight making regression coefficient b=1. Estimate the variance. b) Obtain least-squares estimate of b, hence, estimate the total actual weight. Estimate the variance.

3) .

Consider the following data $N = 442, n = 67, \bar{y}_n = 42.6, \bar{x}_n = 67.6, \bar{X}_n = $, $S_x^2 = 129.6, S_y^2 = 79.2, S_{xy} = 57.2$. Obtain $V(\hat{Y})$.

4)

. A population contains 82 units a sample of 10 units is selected by SRSWOR and observed study variables and auxiliary variables are given below. The mean of 82 auxiliary variables is 72.9.

Y_i	17.6	18.2	19.4	10.3	21.4	22.2	17.4	15.9	24.4	21.8
X_i	80.6	82.4	67.6	71.4	76.4	73.2	81.0	79.4	68.2	78.6

(i)   Compute ratio estimate of $\bar{Y}$.
(ii)   Compute regression estimate of $\bar{Y}$.
(iii)   Compute Hartley Ross estimate of $\bar{Y}$.
(iv)   Compute estimates of the variances of estimates in (i) and (ii).

5) .

The following table shows the area under paddy (y) and cultivated area (x) for the villages in the zone divided into two strata. From Stratum I a SRSWOR of size 3 consist of villages numbered 3, 5 and 8; while from

Stratum II villages bearing numbers 2, 6 and 9 were selected by SRSWOR. Obtain (i) Separate ratio estimate (ii) A combined ratio estimate of total area under paddy for all villages along with their variance estimators.

| Sr. No. | Stratum-I | | Sr. No. | Stratum-II | |
	X	Y		X	Y
1	630	250	1	1012	340
2	729	248	2	1181	416
3	865	359	3	780	247
4	305	129	4	815	306
5	569	223	5	1120	403
6	427	335	6	659	271
7	326	412	7	897	357
8	481	503	8	783	295
			9	689	218
			10	1217	398