Oct-2015

B.Sc (Sem. VI) Examination

Statistics : ST - 603

4627

Sampling Theory

Time : 2Hours] **[Total Marks : 70**

Q1 (a) What do you understand by Simple random sampling with replacement ? **4**

(b) In usual notation , derive following expression. **10**

$$\text{Var}(p) = \frac{(N-n)}{N-1} \cdot \frac{P(1-P)}{n}$$

OR

Q1 (a) Explain Determination of sample size for estimating population mean when confidence coefficient is given. **8**

(b) Explain the method of selection of Stratified Random sample. **6**

Q2(a) What's the Difference between Sampling with replacement and without replacement? **4**

(b) Prove that Sample proportion is an unbiased estimator of Population proportion. Obtain an unbiased estimator of NP **(in case of SRS)** **10**

OR

Q2 (a) Define proportional allocation. Give Derivation of the expression for the standard error of the $\overline{Y}_{st}$ & $N\,\overline{Y}_{st}$ when this allocation is used. 8

(b) Explain Determination of Sample Size (in case of SRS) for estimating population mean when Coefficient of variation is given. 6

Q3(a) Explain real life situation where Cluster sampling is appropriate 8

(b) State the difference between stratified and simple random sampling **6**

OR

Q3(a) How does systematic sampling differ from stratified Sampling? **4**

(b) For Stratified Random Sampling , Prove that $N\bar{Y}_{st}$as an unbiased estimator of population total .Also derive Standard error of $N\bar{Y}_{st}$. **10**

Q4 (a) Obtain an unbiased estimator of population mean $\bar{Y}$ and its variance in the case of Stratified Random Sampling. **8**

(b) Explain Real life situation where Stratified Random sampling is appropriate. **6**

OR

Q4 (a) Define proportional allocation. Give Derivation of the expression for the variance of the$\bar{Y}_{st}$ & $N\bar{Y}_{st}$ when this allocation is used. **10**

(b) Explain Gain in precision due to stratification. **4**

Q5

(a) Explain Technique of drawing a sample using systematic sampling. **4**

(b) Derive Estimators of population mean and population total for systematic sampling, Also derive standard errors of these estimators. **10**

OR

Q5

(a) Explain Real life situation where systematic sampling is appropriate. **6**

(b) Explain Determination of sample size for estimating population proportion when confidence coefficient is given. **8**