Exam.Code:0004
Sub. Code: 0345

2053

B.A./B.Sc. (General) Fourth Semester

Statistics

Paper-203: Sample Surveys, Design and Analysis of Experiments

Time allowed: 3 Hours Max. Marks: 65

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Attempt the following:-

a) What are sampling errors? (3)

b) Write the advantages of using 'Stratified Random Sampling'? (2)

c) Give the layout of one way classification of data with k classes. (2)

d) Distinguish between fixed and random effects models. (3)

e) What are the advantages of using LSD? (3)

UNIT - I

II. Differentiate between the following:-

a) 'Population' and 'Sample'

b) 'Sample selection' and 'Sample surveys'.

c) 'Complete enumerations' and 'Sample Surveys'. (13)

III. Derive the unbiased estimates of population mean based on sample random sampling without replacement. Also find its variance. (13)

IV. a) Define 'random sampling' and its uses.

b) Write in detail the organizational aspect of survey sampling. (6,7)

V. Show that under various allocations in stratified random sampling and SRSWOR.

$Var(\bar{Y}_{st})_{\text{Neyman allocation}} \leq Var(\bar{Y}_{st})_{\text{Prop. Allocation}} \leq Var(\bar{Y}_{st})_{\text{SRSWOR}}$,

Where the symbols used have their usual meaning. (13)

P.T.O.

UNIT - II

VI. Write down the model used for analyzing two-way classification of data with more than one but equal (m) observations per cell under the fixed effects model. Also give the complete analysis and perform ANOVA table. (13)

VII. What do you mean by basic principles of design of experiments? Explain in detail all the three basic principles and their importance in designing an experiment. (13)

VIII. Give the complete analysis of one way classification of data and perform its ANOVA. If the null hypothesis $H_0 : \mu_1 = \mu_2 = ... = \mu_k$ i.e. homogenecity of k treatment means is rejected, how will you proceed to test the significance of the difference between any two treatment means. (13)

IX. Find the expectations of various sum of squares used in the analysis of randomized block design (RBD). Also give advantages of using RBD over completely randomized design (CRD). (13)

x-x-x