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SVIS 323 A -16

B.Sc. VIth Semester Degree Examination

Mathematical Statistics

(Sampling Techniques and Design of Experiments)

Paper - VII (6.1)

Time : 3 Hours Maximum Marks : 80

Instructions to candidates:

Statistical tables and graph sheets will be supplied on request

Section -A

I. Answer the following questions. **(15×1=15)**

1. Complete enumeration of population units is called
   a) Sample survey
   b) Census
   c) Estimation
   d) None
2. The probability of selecting a specified unit is equal in all the draws of
   a) SRSWR
   b) SRSWOR
   c) Stratified sampling
   d) None
3. In SRSWOR the probability of selecting any specified unit in the third draw is
   a) $\frac{1}{N}$
   b) $\frac{3}{N}$

c) $\frac{1}{N-2}$

d) $\frac{1}{N-3}$

4. In stratified sampling, strata are so formed that the units within each strum are
   a) random
   b) homogeneous
   c) heterogeneous
   d) none
5. The number of principles of a sample survey are
   a) two
   b) three
   c) four
   d) none
6. ANOVA technique is applicable for
   a) estimation of correlation
   b) estimation of parameters
   c) testing for equality of several means
   d) testing for equality of several variances
7. In three way classification, the total sum of squares is decomposed into
   a) 3 parts
   b) 4 parts
   c) 6 parts
   d) none
8. Analysis of RBD is based on
   a) two way classification
   b) one way classification
   c) three way classification
   d) none

9. The layout of LSD may have
   a) 8 plots
   b) 12 plots
   c) 16 plots
   d) none
10. LSD is based on the principle(s)
   a) randomisation
   b) replication
   c) local control
   d) all the three a,b and c
11. SRS is efficient if the population units are almost _____
12. In _____ sampling, the sample units are equally spaced.
13. Census is not economic as campared to _____
14. CRD is used to test the homogeneity of k-classes of _____ factor(s).
15. The mathematical model of data in LSD_____

Section -B

II. Answer any five of the following. **(5×5=25)**

16. Explain sampling errors state their important reasons.
17. Show that in SRSWOR the probability of selecting a specified unit at any given draw is equal to the probability of selecting it at the first draw.
18. What are the main advantages of stratified sampling over simple random sampling?
19. Define the terms:
   i) Experiment
   ii) Experimental area
   iii) Expereimental unit
   iv) Experimental error
20. Explain any two of the basic principles of experimentation.
21. Discuss the plan and layout of CRD
22. State the merits and demerits of LSD.

Section -C

Answer any **four** questions of the following **(4×10=40)**

23. Explain the principles of sample survey

24. In SRSWOR, prove that

$V(\bar{y}_n)=\left(\frac{1}{n}-\frac{1}{N}\right)S^2$

25. Instratified sampling, show that $V(\bar{y}_{st})$ is minimum for fixed total size of the sample if $n_i \alpha\ Ni, si$

26. Discuss the comparison of systematic sampling and SRSWOR

27. Describe the statistical analysis of randomised block design.

28. Explain the estimation of a missing value in latin square design.
