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Reg. No.....

Name.....

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, NOVEMBER 2022

Fourth Semester

Complementary Course—STATISTICS – SAMPLE SURVEY DESIGNS

(For B.Sc. Computer Applications)

[2013-2016 Admissions]

Time : Three Hours Maximum Marks : 80

Part A (Short Answer Questions)

Answer **all** *of questions.*
Each question carries 1 *mark.*

1. What is census ?
2. Define statistical population
3. Define sampling unit
4. Define parameter
5. What do you mean by an unbiased estimate ?
6. Define stratified random sampling.
7. Define standard error.
8. In which type of distributionstratification is highly valuable ?
9. State the type of allocations of the sample sizes for different strata.
10. What is cluster sampling ?

(10 × 1 = 10)

Part B (Brief Answer Questions)

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. What is subjective or judgement sampling ?
12. Distinguish between sampling and non sampling errors.
13. What do you mean by mixed sampling ?

Turn over

14. How will you select a simple random sample ?

15. What do you mean by dichotomic classification ?

16. Outline 2 random number tables or series.

17. What is 'stratifying factor' ?

18. Outline the advantages of stratified random sampling

19. How Neymann's optimum allocation gives better estimate than proportional allocation ?

20. What is a systematic sample ?

21. What are the advantages of systematic sampling ?

22. Distinguish between clusters with equal size and varying size with a suitable example.

(8 × 2 = 16)

Part C (Descriptive/Short Essay Type Questions)

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. What are the different types of sampling ? Discuss briefly its advantages and disadvantages.

24. Under what circumstances would you recommend :

    (a) Simple random sampling.

    (b) Non probability sampling.

25. What are the principal steps in a sample survey ?

26. Explain simple random sampling schemes from finite populations with and without replacement.

27. Prove that in SRSWOR sample mean square is an unbiased estimate of population mean square.

28. In a stratified random sampling propose an unbiased estimate for population mean.

29. Discuss the conditions under which stratified sampling is more reliable than simple random sampling

30. Distinguish between linear systematic sampling and circular systematic sampling

31. Compare the precision of estimate from cluster sampling with SRS.

(6 × 4 = 24)

Part D (Long Essays)

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. What is a sample survey ? Compare the advantages and limitations of sample survey over census method of enquiry.

33. Define SRSWR and SRSWOR from a finite population. Derive the unbiased estimates of population mean and its variance based on the above two methods. Compare the efficiencies of the estimates of the population mean.

34. With a cost function $C = a + \sum c_i n_i$ prove that the variance of the estimated mean $\bar{y}_{st}$ is minimum when n_i is proportional to $N_i S_i / \sqrt{C_i}$. What conclusion can you draw from this result ?

35. Under what circumstances systematic sampling is optimum. In usual notations prove that systematic sample mean is more precise than the mean of a simple random sample taken without replacement if $s^2_{wsy} > S^2$.

(2 × 15 = 30)