D 70362 (Pages : 2) Name.....

Reg. No.....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

(CUCBCSS—UG)

Statistics

STS 5B 07—SAMPLE SURVEYS

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *questions in* **one word.**
Each question carries 1 *mark.*

Name the following :

1. Give an example for non random sampling.
2. The real valued function of sample observation is :
3. If the population or the universe is heterogeneous in nature, the sampling method used is:

Fill up the blanks :

4. The sampling error decreases when ————.
5. in SRSWOR, the probability of the sample of size 'n' being selected is ————.
6. The characteristic under study is ———— within the stratum.
7. In SRSWR, sample mean square is ———— estimator of population mean square.

Write True or False :

8. The study based on complete enumeration is known as pilot survey.
9. The probability of a particular unit being selected in any of the draws by SRSWOR method is equivalent to the case of SRSWR.
10. With usual notations, the finite population correction is $\frac{N-n}{n}$.

(10 × 1 = 10 marks)

Section B

Answer **all** *questions in* **one sentence** *each.*
Each question carries 2 *marks.*

11. What is sampling frame ?
12. Define non response error.
13. Define simple random sample.
14. What is allocation in stratified random sampling ?
15. Define linear systematic sampling.

Turn over

22. For answer -4 Marks

Section D

Answer **any four** questions.
Each question carries 6 marks.

23. For 3 methods- 2+2+2 Marks.
24. For answer 6 Marks

16. Discuss a situation where systematic sampling is better than simple random sampling.
17. Define cluster sampling.

(7 × 2 = 14 marks)

Section C

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

18. What are the advantages of secondary data ?
19. In SRSWOR, show that sample mean square is unbiased estimator of population mean square.
20. What are the principles of Stratification ?
21. Define stratified random sampling. Show that in stratified sampling $\overline{y_{st}} = \sum_{h=1}^{L} \frac{Nh}{N} \overline{y_h}$ is an unbiased estimate of the population mean.
22. How single, two stage cluster sampling does differs from stratified sampling. Explain with examples.

(3 × 4 = 12 marks)

Section D

Answer any **four** *questions.*
Each question carries 6 *marks.*

23. Discuss the methods of selecting simple random sampling.
24. Derive the sample size 'n' in Simple random sampling for proportion for a given precision.
25. Describe variance of sample mean in Neyman optimum allocation.
26. Find the unbiased estimator and its variance of population mean under systematic sampling.
27. For a population with linear trend prove that $V(\overline{y_{st}}) : V(\overline{y_{sys}}) : V(\overline{y_{rand}})$ is 1 : n : n, if population size N is large.
28. Compare the relative efficiency of cluster with simple random sampling.

(4 × 6 = 24 marks)

Section E

Answer any **two** *questions.*
Each question carries 10 *marks.*

29. Discuss the important steps in a large scale sample survey.
30. In Stratified sampling, find the value of sample size in each stratum under optimum allocation with fixed sample size. Hence find the variance of the estimated mean.
31. Define linear cost function in sample survey. Obtain the expression for the sample size from each stratum under optimum allocation with fixed linear cost
32. With usual notation, show that $V(\overline{y_{st}})_{opt} \leq V(\overline{y_{st}})_{prop} \leq V(\overline{y})_{srswor}$.

(2 × 10 = 20 marks)

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FIFTH SEMESTER B.Sc DEGREE EXAMINATION NOVEMBER 2017

(CUCBSS –UG)

STATISTICS

STS 5B 07- SAMPLE SURVEYS

Answer key

Section A

Answer **all** questions in **one word**

Each question carries 1 mark.

Name the following.

1. Any one method -1M
2. Statistics -1 M
3. Stratified random sampling.-1 M

Fill up the blanks:

4. Sample size increases.
5. Answer -1 M
6. Homogeneous -1 M
7. Biased -1 M

Write True or False

8. False -1 M
9. True -1 M
10. For answer -1 M

Section B

Answer **all** questions in **one sentence each.**

Each question carries 2 marks.

11. Definition -2 M
12. Definition -2 M
13. Definition -2 M.
14. Definition -2 M
15. Definition -2 M
16. For a situation -2 M.
17. Definition -2 M

Section C

Answer **any three** questions.

Each question carries 4 marks.

18. For each advantage 1 mark
19. For each step -1 mark
20. Answer -1 Mark
21. Answer - 4 marks
22. For answer -4 Marks

Section D

Answer **any four** questions.

Each question carries 6 marks.

23. For 3 methods- 2+2+2 Marks.
24. For answer 6 Marks

26. For detailed answer -4 Marks
27. For answer -4 marks
28. Answer -4 marks.

Section E

Answer **any two** questions.

Each question carries 10 marks.

29. Minimum 8 points with explanation -10 marks
30. Answer -10 marks
31. Answer -10 marks
32. For detailed steps -10 marks