

UGANDA MARQUERS UNIVERSITY
FACULTY OF SCIENCE
FINAL ASSESSEMENT SEMESTER TWO 2009/2010
STA3201: SAMPLING THEORY
BSC III GEN

DATE: 3rd MAY 2010

TIME: 2:00pm – 5:00pm

Instructions

Attempt Question One and any other three

Use of relevant examples where necessary is highly recommended

QUESTION ONE (compulsory)

Explain the following concepts as applied in sampling theory

- | | |
|-----------------------------------|-----------|
| a) Population | (2 MARKS) |
| b) Sampling unit | (3 MARKS) |
| c) Parameters | (3 MARKS) |
| d) Sample | (2 MARKS) |
| e) Subjective (non-random) sample | (4 MARKS) |
| f) Random (probability) sample | (4 MARKS) |
| g) Sample design | (4 MARKS) |
| h) Survey design | (4 MARKS) |
| i) Sampling frame | (4 MARKS) |
| j) Estimator | (3 MARKS) |
| k) Estimate | (3 MARKS) |
| l) Bias | (4 MARKS) |

QUESTION TWO

- What are the main sources of socio-economic data in Africa? Briefly explain each of the identified sources. (10 MARKS)
- Discuss the major constraints to data production in Africa. (10 MARKS)

QUESTION THREE

- What is a sampling frame and how important is it in survey sampling? (10 MARKS)
- When should a sampling frame be declared adequate? (5 MARKS)
- What are the desirable properties of estimators? (5 MARKS)

QUESTION FOUR

A SRS of 10 farmers selected from an Enumeration Area with a population of 100 farmers, gave the following data:

Number of fields for each selected farmer

Farmers	Number of fields
i	Y_i
1	2
2	4
3	1
4	3
5	3
6	2
7	4
8	3
9	1
10	2
Total	25

Determine:

- Average number of fields per farmer and its standard error (10 MARKS)
- Proportion of farmers with less than 3 fields and its standard error. (10 MARKS)

QUESTION FIVE

The following table gives the size (number of small holders) of 10 villages in a district and total maize production (90kg.bags) for each of the villages.

Village sizes and total maize production (90kg.bags)

Village (i)	Number of holders	Maize production (90 kg bags)
1	50	1000
2	30	400
3	45	560
4	25	280
5	40	677
6	26	271
7	15	183
8	35	230
9	60	811
10	19	288

Select a sample of 4 villages using PPS with replacement.
Using the selected sample,

- a) Obtain an estimate of total production for the district. (10 MARKS)
 b) Calculate the CV of the estimate. (10 MARKS)

QUESTION SIX

A complete census of the value of manufacturing shipments was taken in 1991. The following table gives the value of shipments in each of a SRS of the value of 10 shipments drawn from the value of 30 shipments. The problem is to estimate the value of the shipments in 1992. The true 1991 total, X , is assumed to be known. Its value is sh. 19.5 billion.

Value of shipments in 1991 and 1992

Value of shipments in 1991 (sh.)(X_i)	0.3	1.1	0.5	0.4	1.0	0.7	0.2	0.3	2.4	0.1
Value of shipments in 1992 (sh.)(y_i)	0.1	0.6	0.8	0.6	1.0	0.8	0.9	0.8	2.7	0.2

Also calculate its variance and standard deviation. (20 MARKS)

*****Good luck*****
 CRK