



**University of Kelaniya – Sri Lanka**  
**Centre for Distance & Continuing Education**  
**Bachelor of Science (General) External**  
**Second year second semester examination - 2019 (2024 February)**  
**(New Syllabus)**  
**Faculty of Science**

**Statistics**  
**STAT 27542 – Survey Methods & Sampling Techniques**

No. of Questions: **Four (04)**

No. of Pages: **Three (03)**

Time: **Two (02) Hours.**

Answer **all** questions.

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1. The concept of ‘*Survey*’ is any activity that collects information in an organized and methodical manner about characteristics of interest from some units of a population using well-defined concepts, methods, and procedures, and compiles such information into a useful summary form.
- (a) Mention three (03) survey methods.
  - (b) One of the most important steps in the sample survey is *data collection*. Data is classified into two categories: Numerical and Categorical.
    - (i) Write two (02) examples for **each** category.
    - (ii) If numerical, mention whether it is *continuous* or *discrete* and if it is categorical, mention whether *nominal* or *ordinal*.
  - (c) Discuss the difference between the primary data and the secondary data.
  - (d) Explain the importance of a representative sample in a survey and provide two methods to ensure the representativeness of a sample.

[25 marks]

2. Sampling is the process of selecting a subset of elements from a larger population to make inferences or draw conclusions about the entire population. But a census observes or measures every member of a population.

- (a) Write down two advantages and two disadvantages of census.
- (b) Why do researchers need sampling? Explain your answer using four reasons.
- (c) Compare and contrast probability sampling and non-probability sampling.
- (d) What do you mean by 'Sampling frame'?

[25 marks]

3. Imagine you are a researcher tasked with conducting a nationwide survey to gather information on the public's opinion regarding a new government policy.

- (a) Discuss and justify the sampling method you would choose for this survey. Include considerations such as the
  - (i) target population,
  - (ii) sampling frame,
  - (iii) representativeness,
  - (iv) suitability of the sampling technique.
- (b) Outline the steps you would take to ensure a representative and reliable sample.
- (c) Systematic sampling is one of the probability sampling techniques.
  - (i) Define and explain the concept of systematic sampling.
  - (ii) Write down two advantages and two limitations associated with systematic sampling. Provide a real-world example to support your explanation.

[25 marks]

4. A survey was conducted in various rural areas by contacting 425 people to gather information about unemployment. The dataset includes variables such as age, education level, types of employment sought, and reasons for unemployment.

- (a) Determine the ideal survey sample size for the above population. Use a 99% confidence level and a 50% standard of deviation.

*(Hint: For 99% confidence, you would have a z-score of 2.58,  $e^2=0.052$ )*

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

- (b) Mention the most appropriate graphical representation method that can be used to represent educational level with the frequency of the participants.
- (c) What is the most suitable data collection method for the above study. Explain with reasons.
- (d) Explain sampling error by considering the above survey study.
- (e) As a researcher, you decide to use an online survey method for data collection. Briefly discuss two advantages and two potential challenges associated with using online surveys.

[25 marks]

**... End of the paper...**