Question One

a. Sampling Bias is when some members of a population are systematically more likely to be selected for a study than others, resulting in a sample that doesn't accurately represent the target population.

i) Three common types of sampling bias:

1. Self-Selection Bias - Occurs when participants choose whether to participate in the study e.g: Online surveys where only highly motivated people respond

2. Convenience Sampling Bias - Results from selecting easily accessible participants e.g: Conducting research only with college students because they're readily available.

3. Survivorship Bias - Focuses only on people/things that made it past some selection process e.g: Studying only successful businesses while ignoring failed ones

b. Validity refers to how well a test measures what it claims to measure.

- Internal Validity: Extent to which a study establishes a cause-and-effect relationship between variables, minimizing alternative explanations

- External Validity: Extent to which results can be generalized to other situations, populations, or settings

1. Four Main Forms of Validity:

1. Construct Validity - How well a test measures the intended theoretical construct

2. Content Validity - Whether a measure covers all aspects of the concept being studied

3. Criterion Validity - How well test scores predict or correlate with other related measures

4. Face Validity - Whether a test appears to measure what it claims to measure

c. Reliability refers to the consistency and stability of measurements over time and across different conditions.

i) Factors Contributing to Lack of Reliability:

1. Measurement Error - Human error in data collection

2. Environmental Factors - Changes in testing conditions

3. Participant Factors - Fatigue or mood variations

4. Sample Size Issues - Too small samples leading to unstable results

Question Two

a. Threats to Validity

- Population Representation: Selecting only two towns out of all towns served by SGR limits generalizability

- Using US-based questionnaire without adaptation

- Questionnaire might not cover all relevant aspects of SGR's economic impact

- One-time data collection

- No baseline data from before SGR implementation

b. Threats to Reliability

- Non-piloted foreign questionnaire

- No consideration of seasonal business variations

- Equal sample sizes for different groups regardless of actual population proportions

c. Biases and Their Solutions

- Use proportionate sampling based on actual population distribution

- Include more towns along the SGR route

- Consider seasonal variations in business activity

- Adapt questionnaire to Kenyan context