Quiz 5:

1. Which of the following is true?

a) In probability sampling, everyone in the population must have a specified chance of making it into the sample.

b) In probability sampling, every group of people of a fixed size taken from the population must have the same chance of being selected.

c) In probability sampling, each individual in the population must have an equal probability of being selected.

d) None of the above

Explanation: In probability sampling, what is important is that each unit of the population has a specified chance of being selected. This chance does not need to be equal for all units. This ensures the sample obtained is free of selection bias due to human judgement.

2. Assume you have a sampling frame of your entire population of interest, which is comprised of 100 people's names. Which of the following methods could not be used to select a simple random sample of 10 people from this population?

a) Assign without replacement to each person a random number from 1 to 100. Choose the people assigned numbers 1 to 10.

b) Write the names on equal sized pieces of paper, put the papers in a hat, mix them, and draw out 10 names.

c) Sort the names based on alphabetical order, and choose the first 10.

d) Each of the above methods would yield a simple random sample.

Explanation: In simple random sampling, every unit in the population of interest must have the same chance of being included in the sample. The procedure described in c) does not satisfy this requirement.

3. Suppose you want to measure the build quality of an industrial product. The factory had manufactured 100 batches, with 8 units per batch, for a total of 800 units. You decide to sample 80 of the units. Suppose you randomly sample 10 batches and then select every unit in those 10 batches to be in your sample, for a total of 80 units. What sampling method did you use?

a) A systematic sample

b) A stratified sample

c) A cluster sample

d) A simple random sample

Explanation: See unit 3 slide 17 for a description of cluster sampling.

4. Which of the following samples will produce the least bias?

a) A simple random sample of 2520 people with 10% response rate.

b) A simple random sample of 360 people with 70% response rate.

c) A convenience sample of 252 people with 100% response rate.

d) An online survey with 252 responses.

Explanation: In unit 4 of chapter 3 we told you that non-response distorts the results of studies. Usually non-respondents differ from respondents. We need to study the extent of the effect in order to reduce the bias of the collected information. Comparing C and B, a simple random sample with 70% response rate is better than a convenience sample of 100% response rate.

5. A University wants to conduct a study about student life among its current students. It has 52000 current students. Copies of the survey form are mailed to all 23000 residents on the university campus, out of which only 4800 responded. What is the response rate?

       a. 92%
       b. 21%
       c. 19%
       d. 9%
       e. None of the above

Explanation: Response rate is the fraction (number of respondents / sample size)*100%, which equals (4800/23000)*100% in this case.