Practice Assignment: Experimental Design

Questions 1–4: For each scenario, determine whether it is an example of random sampling or random assignment.

1) A professor wanted to find the best ways to help students reduce stress. Students were recruited to participate in different stress-relief groups. Each student who volunteered for the research study was randomly assigned to either an aromatherapy group or a deep-breathing group.
   a) Random sampling
   b) Random assignment

2) A marketing researcher wanted to know which logo was preferred by customers. Customers were contacted using a randomly-generated list of email addresses.
   a) Random sampling
   b) Random assignment

3) A healthcare worker wanted to know if married people live longer than single people. Participants for the study were recruited using lists of single and married people randomly generated by the electronic health record system.
   a) Random sampling
   b) Random assignment

4) A humane society volunteer wanted to know what kind of food was better for dog health. Each dog in the shelter was randomly assigned to eat either wet food or dry food.
   a) Random sampling
   b) Random assignment

5) Scientist A designed a research study to examine the effect of water temperature on coral bleaching. Samples of coral were harvested and brought to the lab, where they were placed in carefully-controlled aquariums. Salinity, pH, light, and water depth were the same in both groups. The control group had a water temperature of 25°C, while the experimental group had a water temperature of 40°C. Coral samples from the Great Barrier Reef in Australia were placed in the experimental group, while

samples from the Florida Keys were placed in the control group. After three weeks, there was a much higher rate of bleaching in the experimental group. In three to five complete sentences, discuss the strengths and weaknesses of this study design. For any weaknesses, suggest changes to improve the study design.

6) Scientist B designed a research study to examine the effect of a new medication on a rare genetic disorder causing muscle weakness in young boys. Six boys with the disorder were enrolled in the study and randomly assigned to either the experimental or control group. Participants in the experimental group received an injection of the new medication once weekly for six weeks. Participants in the control group received an injection of a harmless vitamin solution once weekly for six weeks. Participants were not told whether they were in the experimental or control group. Over the course of the study, Scientist B tracked the muscle strength of each participant. At the end of the six weeks, four boys showed typical decreases in muscle strength, but two of the boys in the experimental group showed increases in muscle strength.

   In three to five complete sentences, discuss the strengths and weaknesses of this study design. For any weaknesses, suggest changes to improve the study design.

7) A university professor wants to know if class time affects students' grades. Design a study that helps answer this research question.

