Quiz 2 Review

Name: _____

Sampling Techniques, Bias, Errors & Types of Experimentation Date:_____ Period:___

Vocabulary—*Use your notes to find the exact answer that fits each blank.*

1. Having no specific pattern, purpose, or objective is _____.
2. The design of a statistical study is _____ if it systematically favors certain outcomes.
3. When a study does not favor of one outcome over another it is considered _____
4. A _____ is a basic sampling technique where each individual is chosen entirely by chance
5. A _____ is a sampling technique where the individuals that are the easiest to reach are the ones who are selected.
6. A _____ is a sampling technique where every kth element is taken.
7. A _____ _____ sample consists of people who chose themselves by responding to a general appeal.
8. A _____ is a sampling technique in which the population is grouped based on some characteristic.
9. A _____ sample is a sample of the population that is split into groups geographically. Take a separate SRS of each group and combine the results to make a full sample.
10. An error in which the population that is actually sampled is not as broad as the population that the researcher desires to sample is _____.
11. _____ _____ are mistakes in mechanical tasks such as doing arithmetic or entering responses into a computer.
12. The error which occurs when someone gives an untruthful or incorrect response is _____.
13. _____ is an error in which people refuse to be involved.
14. A _____ variable explains or causes changes in the response variable.
15. A _____ variable measures a result of a study.
16. A _____ variable has an important effect on the study but is not one of the explanatory variables studied.
17. The individuals studied in an experiment are the _____.
18. A _____ is any specific experimental condition applied to the subjects.
19. The members of the _____ group receive no treatment.
20. A _____ is a harmless pill, medicine, or procedure
21. A practice is considered _____ _____ if the subjects AND the experimenters do not know what treatment they are receiving.
22. When subjects are divided into subgroups, then, subjects within each block are randomly assigned to treatment conditions this practice is considered a _____ _____.
23. _____ _____ Experiments should compare treatments rather than attempt to assess the effect of a single treatment in isolation.

Work Problems—*answer each question fully.*

Sampling……

1. We divide the class into two groups: first year students and others. We then take random samples from each group. This is an example of
   (a) simple random sampling
   (b) clustered sampling
   (c) stratified random sampling
   (d) systematic random sampling

2. If a sampling method is biased then
   (a) we need to improve the sampling method to remove the bias.
   (b) we need to increase the sample size to remove the bias.
   (c) we should sample from a larger population
   (d) the sample statistic will be close to the population parameter.
   (e) the center of the distribution of the statistic will be close to the population parameter.

3. You want to ask a sample of professors at your school how they feel about the tenure system for faculty. You realize that opinions may differ depending on the rank of the professor, especially because assistant professors do not have tenure. So you take separate SRS's of assistant, associate, and full professors and combine them to form your sample. You used a
   (a) simple random sample.
   (b) stratified random sample.
   (c) voluntary response sample.
   (d) convenience sample.

For #4 – 6: Do doctors in managed care plans give less charity care? Researchers chose 60 communities at random, then chose doctors at random in each community. In all, they interviewed 10,881 doctors. Overall, 77.3% of the doctors said they had given some care free or at reduced rates because of the patient's financial need in the month before the interview. Doctors who received at least 85% of their practice income from managed care plans were significantly less likely than other doctors to provide charity care.

4. This study is
   (a) an experiment.
   (b) an observational study
   (c) a survey.
   (d) A census

5. The individuals in this study were selected using
   (a) a stratified sample
   (b) voluntary response sample
   (c) a simple random sample
   (d) a cluster sample
   (e) an SRS
   (f) a convenience sample

6. Some doctors who did not give any charity care may say that they did. If so, the study suffers from
   (a) sampling errors that require a better random sampling design.
   (b) bias: the sample result will systematically underestimate the true percent of doctors who give charity care.
   (c) Response Errors
   (d) Nonresponse

Tell whether the samples are simple random, cluster, stratified, voluntary response, systematic or convenience.

7. Call every hundredth name in the phonebook _____
8. Assigning everyone at the seminar a number and surveying only people whose number is selected by the digital system. _____
9. Survey people who come up to the "Vote Now" booth at the high school Football game. _____
10. Choosing to survey samples the students in first, second, and third lunch shifts. _____
11. Handout surveys to the students who are in the library before school. _____
12. Surveying principals from Pickens, Spartanburg, and Greenville Counties. _____

Experimentation……

For #1 – 2: 40 boys and 40 girls with ADD (Attention Deficit Disorder) were selected to participate in a study of a new drug's effectively in controlling ADD. The boys were randomly divided into 2 groups and the girls were randomly divided into 2 groups. One group of each gender received the new drug, while the other group received the old drug.

1. This study was __?__.
    A. a simple random sample
    B. a completely randomized experiment
    C. a block design experiment, blocked on severity of ADD
    D. a block design experiment, blocked on gender
2. What is the explanatory variable?
    A. reading test scores at the beginning
    B. reading test scores at the end
    C. difference in beginning and ending reading scores
    D. the drug
    E. gender

For #3 – 4: A pharmaceutical company wants to test a new diet drug. They recruited 20 overweight people to participate in the study. Ten people were randomly assigned to receive the new drug and the other 10 to receive a placebo. All 20 participants were weighed before treatment and then again after 12 weeks of treatment. The change in weight was found for each participant. The results were not statistically significant.

3. This study was __?__.
    A. an observational study
    B. a simple random sample
    C. a randomized comparative experiment
    D. a block design experiment
4. What is the response variable?
    A. the beginning weight of each participant
    B. the weight of each participant after 12 weeks
    C. the difference in weight of each participant after 12 weeks
    D. the 10 overweight people who took the new drug
    E. the 20 overweight people who participated in the study

Answer the following questions.

5. Which of the following is true about a double-blind experiment?
    A. each subject in the experiment is given two sets of blindfolds
    B. both the subjects and the evaluators are each given blindfolds
    C. the subjects do not know which treatment group they are in
    D. the evaluators do not know which treatment group the subjects are in
    E. neither the subjects nor the evaluators know which treatment group the subjects are in
6. An experiment is to be conducted to determine if a new drug for high blood pressure is more effective than the present drug. There is a concern that men and women will react differently to the drug. Therefore, the experimenter should ____?____ .
    A. use only men in the experiment
    B. use only women in the experiment
    C. just randomly assign all participants to the two groups
    D. first block on gender
    E. assign half the men and half the women to each group

7. A toy manufacturer wants to test 3 different types of hinges for a toy box. Since boys and girls tend to play differently with toys, how should this study be conducted?
    A. as an observational study
    B. as a randomized comparative experiment
    C. as a block design experiment, blocking on hinges
    D. as a block design experiment, blocking on gender

8. We want to test a new fertilizer, Giant Grow, on three types of vegetables: tomatoes, squash, and cucumbers. Is Giant Grow better than the currently used fertilizer or is it better than using no fertilizer at all? How many experimental groups would we need?
    A. 2 C. 3 E. 4
    B. 5 D. 6

9. If subjects in an experiment are separated into groups of men and women before the randomization is done, then we should think of gender as a(n) __?__ variable.
    A. blocking
    B. explanatory
    C. lurking
    D. random
    E. response

10. Why is blocking used in experiment?
    A. to make the results more statistically significant
    B. to minimize the placebo effect
    C. to minimize differences between treatment groups
    D. to reduce bias

11. If we want to show that one variable causes another variable, then we should use a(n) ? .
    A. an observational study
    B. a sample survey
    C. an experiment
    D. a census