

Advanced Placement Statistics  
Chapter 5 Review Sheet

Name: Mr. Morton  
Date: \_\_\_\_\_ Period \_\_\_\_\_

A. Multiple Choice

1. Data were collected in 20 cities on the percentage of women in the workforce. Data were collected in 1990 and again in 1994. Gains, or losses, in this percentage were the measurement upon which the studies conclusions were to be based. What kind of design was this?
  - I. A matched pairs design
  - II. An observational study
  - III. An experiment using a block design
  - (a) I only
  - (b) II only
  - (c) III only
  - (d) I and III only
  - (e) I and II only
  
2. You want to do a survey of members of the senior class at your school and want to select a simple random sample. You intend to include 40 students in your sample. Which of the following approaches will generate a simple random sample?
  - (a) Write the name of each student in the senior class on a slip of paper and put the papers in a container. Then randomly select 40 slips of paper from the container.
  - (b) Assuming the students are randomly assigned to classes, select two classes at random and include those students in your sample.
  - (c) From a list of all seniors, select one of the first 10 names at random. Then select every  $n$ th name on the list until you have 40 people selected.
  - (d) Select the first 40 seniors to pass through the cafeteria door at lunch.
  - (e) Randomly select 10 students from each of the four senior calculus classes.
  
3. Which of the following are important in designing an experiment?
  - I. Control of all variables that might have influence on the response variable.
  - II. Randomization of subjects to treatment groups.
  - III. Use a large number of subjects to control for small-sample variability.
  - (a) I only
  - (b) I and II only
  - (c) II and III only
  - (d) I, II, and III
  - (e) II only
  
4. Your company has developed a new treatment for acne. You think men and women may react differently to the medication, so you separate them into two groups. Then the men are randomly assigned to two groups and the women are randomly assigned to two groups. One of the two groups is given medication and the other is given a placebo. The basic design of this study is
  - (a) completely randomized
  - (b) blocked by gender
  - (c) completely randomized, blocked by gender
  - (d) randomized, blocked by gender and type of medication
  - (e) a matched pairs design

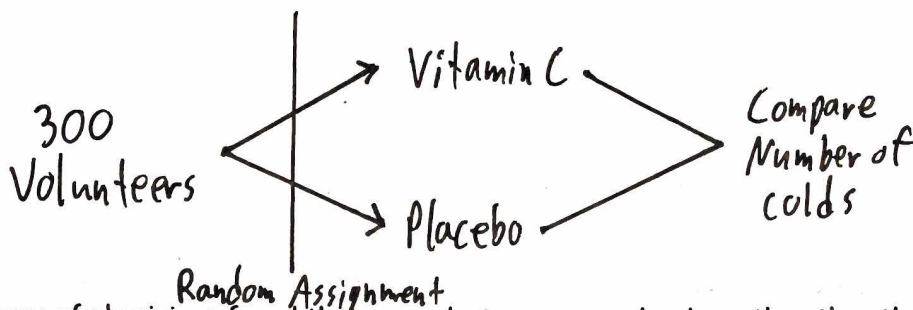
5. A double blind design is important in an experiment because pg. 277
- (a) There is a natural tendency for subjects in an experiment to want to please the researcher.
  - (b) It helps control for the placebo effect.
  - (c) Evaluators of the responses in a study can influence the outcomes if they know which subjects are in the treatment groups and which are in the control group.
  - (d) Subjects in a study might react differently if they knew they were receiving an active treatment or a placebo.
  - (e) All of the above are reasons why an experiment should be double-blind.
6. Which of the following is not an example of a probability sample?
- (a) You are going to sample 10% of a group of students. You randomly select one of the first 10 students on an alphabetical list and then select every 10 students after that on the list.
  - (b) You are a sports-talk radio host interested in opinions about whether or not Pete Rose should be elected to the Baseball Hall of Fame, even though he has admitted to betting on his own teams. You ask listeners to call in and vote.
  - (c) A random sample of drivers is selected to receive a questionnaire about the manners of Department of Motor Vehicle employees.
  - (d) In order to determine attitudes about the Medicare Drug Plan, a random sample is drawn so that each age group (65-70, 70-75, 75-80, 80-85) is represented in proportion to its percentage of population.
  - (e) In choosing respondents for a survey about a proposed recycling program in a large city, interviewers choose homes to survey based on rolling a die. If the die shows a 1, the house is selected. If the die shows 2-6, the interviewer moves to the next house.
7. Stratifying a survey sample will provide the following? pg. 278
- (a) reduce variation
  - (b) increase sample size
  - (c) biased results
  - (d) subject restriction
8. If you want to study the behavior of children at play which is the best method for collecting data?
- (a) Presenting questionnaires to the children
  - (b) Conducting one-on-one interviews with the children's parents
  - (c) Observing the children's behavior in a playground
  - (d) Simulating a playground in the laboratory and setting up an experiment to examine the effects of the playground on the behavior of children
9. A subject's expectations about the influence of treatment is called
- (a) placebo effect
  - (b) blocking
  - (c) sampling effect
  - (d) blinding effect
10. To study a cause-and-effect relationship between variables, which of the following methods of data collection should be used
- (a) Observational study
  - (b) survey (presentation of questionnaire)
  - (c) survey (use of one-on-one interview)
  - (d) experiment

## B. Free Response

- interested
1. You are identified in the extent to which ingesting vitamin C inhibits getting a cold. You identify 300 volunteers, 150 of whom have been taking more than 1000 mg of vitamin C a day for the past month, and 150 of whom have not taken vitamin C at all during the past month. You record the number of colds during the following month for each group and find that the vitamin C group had significantly fewer colds. Is this an experiment or an observational study? Explain. What do we mean in this case when we say the finding is significant?

Observational Study - No treatment is being imposed.

2. Design an experiment that employs a completely randomized design to study the question of whether or not taking large doses of vitamin C is effective in reducing the number of colds.



3. A survey of physicians found that some doctors gave a placebo rather than the actual medication to patients who experience pain symptoms for which no physical reason can be found. If the pain symptoms were reduced, the doctors concluded that there was no real physical basis for the complaints. Do the doctors understand the placebo effect? Explain.

No, a real effect can occur even from a placebo.

~~OMIT~~

4. Explain how you would use a table of random digits to help obtain a systematic sample of 10% of the names on an alphabetical list of voters in a community. Is this a random sample? Is it a simple random sample?

5. Interviewers, after the 9/11 attacks, asked a group of Arab Americans if they trust the administration to make efforts to counter anti-Arab activities. If the interviewer was of Arab descent, 42% responded "yes" and if the interviewer was of non-Arab descent 55% responded "yes." What seems to be going on here?

Response Bias!



SRS

- 6. There are three classes of statistics in your school, each with 30 students. You want to select a simple random sample of 15 students from the 90 students as part of an opinion-gathering project for your social studies class. Describe your procedure for doing this.

Random Digit Table: Assign 01-90, skip 00 and 91-99. (No repeat)  
 Read table in double digits. Stop when 15 students are selected.

- 7. Question #1 above stated, in part: "You are interested in the extent to which ingesting vitamin C inhibits a cold. You identify 300 volunteers, 150 of whom have been taking more than 1000 mg of vitamin C a day for the past month, 150 of whom have not taken vitamin C at all during the past month. You record the number of cold during the following month for each group and find the vitamin C group had significantly fewer colds." Explain the concept of confounding in the context of this problem and give an example of how it might have affected the finding that vitamin C group has fewer colds.

The group that has already taken vitamin C is already health conscious.

- 8. A shopping mall wants to know about the attitudes of all shoppers who visit the mall. On a Wednesday morning, the mall places 10 interviewers at a variety of places in the mall and asks questions of shoppers as they pass by. Comment on any bias that might be inherent with this approach.

Undercoverage - only asking on a Wednesday morning.

- 9. A questionnaire is being designed to determine whether most people are or are not in favor of legislation protecting the habitat of the spotted owl. Give two examples of poorly worded questions, one biased toward each response.

① Since the habitat of the spotted owl is in danger, are you in favor of the legislation to protect their habitat?

② Are you opposed to spending even more time, money, and resources?

OMIT

- 10. You and nine friends go to a restaurant and check your coats. You all forget to pick up your ticket stubs, and so when you are ready to leave, Hilda, the hatcheck girl, randomly gives each of you one of the ten coats. You are surprised that one person actually receives the correct coat. You would like to explore this further and decide to use a random number table to simulate the situation. Describe how the random number table can be used to simulate one trial of the coat episode. Explain what each of the digits 0 through 9 will represent.

OMIT

- 11. Suppose that, on a planet far away, the probability of a girl being born is 0.6, and it is socially advantageous to have three girls. How many children would a family have to have on average, until they have three girls? Describe and conduct 5 trials of a simulation to help answer this question.

1. A market research company wishes to find out whether the population of students at a university prefers brand A or brand B of instant coffee. A random sample of students is selected, and each student is asked first to try brand A and then to try brand B, or vice versa (with the order determined at random). They then indicate which brand they prefer. This is an example of
  - (A) an experiment.
  - (B) an observational study, not an experiment.
  - (C) stratified sampling design.
  - (D) block design.
2. In order to assess the opinion of students at the University of Minnesota on campus snow removal, a reporter for the student newspaper interviews the first 12 students he meets who are willing to express their opinion. The method of sampling used is
  - (A) simple random sampling.
  - (B) convenience sampling.
  - (C) voluntary response.
  - (D) a census.

Choose a simple random sample of size three from the following employees of a small company.

- |              |            |           |
|--------------|------------|-----------|
| 1. Bechhofer | 4. Kesten  | 7. Taylor |
| 2. Brown     | 5. Kiefer  | 8. Wald   |
| 3. Ito       | 6. Spitzer | 9. Weiss  |

Use the numerical labels attached to the names above and the list of random digits below. Read the list of random digits from left to right, starting at the beginning of the list.

11793 20495 05907 11384 44982 20751 27498 12009 45287 71753 98236 66419 84533

3. Referring to the information above, the simple random sample is
  - (A) 117.
  - (B) Bechhofer, then Bechhofer again, then Taylor.
  - (C) Bechhofer, Taylor, Weiss.
  - (D) Kesten, Kiefer, Taylor.
4. Referring to the information above, which of the following statements is true?
  - (A) If we used another list of random digits to select the sample, we would get the same result that we obtained with the list used here.
  - (B) If we used another list of random digits to select the sample, we would get a completely different sample than that obtained with the list used here.
  - (C) If we used another list of random digits to select the sample, we would get at most one name in common with the sample obtained here.
  - (D) If we used another list of random digits to select the sample, it would be just as likely that the sample that we obtained here would be selected as any other set of three names.

5. In order to take a sample of 90 members of a local gym, I first divide the members into men and women, and then take a simple random sample of 45 men and a separate simple random sample of 45 women. This is an example of a
  - (A) block design.
  - (B) stratified random sample.
  - (C) double-blind simple random sample.
  - (D) randomized comparative experiment.

6. In order to select a sample of undergraduate students in the United States, I select a simple random sample of four states. From each of these states, I select a simple random sample of two colleges or universities. Finally, from each of these eight colleges or universities, I select a simple random sample of 20 undergraduates. My final sample consists of 160 undergraduates. This is an example of
  - (A) simple random sampling.
  - (B) stratified random sampling.
  - (C) multistage sampling.
  - (D) convenience sampling.

7. A call-in poll conducted by *USA Today* concluded that Americans love Donald Trump. *USA Today* later reported that 5640 of the 7800 calls for the poll came from the offices owned by one man, Cincinnati financier Carl Lindner, who is a friend of Donald Trump. The results of this poll are probably
  - (A) surprising, but reliable since it was conducted by a nationally recognized organization.
  - (B) biased, but only slightly since the sample size was quite large.
  - (C) biased understating the popularity of Donald Trump.
  - (D) biased overstating the popularity of Donald Trump.

8. The number of undergraduates at Johns Hopkins University is approximately 2000, while the number at Ohio State University is approximately 40,000. At both schools a simple random sample of about 3% of the undergraduates is taken. We conclude that
  - (A) the sample from Johns Hopkins is more accurate than the sample from Ohio State.
  - (B) the sample from Johns Hopkins is less accurate than the sample from Ohio State.
  - (C) the sample from Johns Hopkins has the same accuracy as the sample from Ohio State.
  - (D) it is impossible to make any statements about the accuracies of the two samples since the students surveyed were different.

*JH has more variation than OS.*

*sample size is more important than population.*

Twelve people who suffer from chronic fatigue syndrome volunteer to take part in an experiment to see if shark fin extract will increase one's energy level. Eight of the volunteers are men and four are women. Half of the volunteers are to be given shark fin extract twice a day and the other half a placebo twice a day. We wish to make sure that four men and two women are assigned to each of the treatments, so we decide to use a block design with the men forming one block and the women the other.

9. Referring to the information above, a block design is appropriate in this experiment if
  - (A) we believe men and women will respond differently to treatments.
  - (B) gender equity is an important legal consideration in this study.
  - (C) we want the conclusions to apply equally to men and women.
  - (D) all of the above.



AP Statistics Ch. 5 Practice Multiple Choice Questions

10. Referring to the information above, suppose one of the researchers is responsible for determining if a subject displays an increase in energy level. In this case, we should probably
- A) use two placebos.
  - B) use stratified sampling to assign subjects to treatments.
  - C) use fewer subjects but observe them more frequently.
  - D) conduct the study as a double-blind experiment.

A study of human development showed two types of movies to groups of children. Crackers were available in a bowl, and the investigators compared the number of crackers eaten by children watching the different kinds of movies. One kind of movie was shown at 8 AM (right after the children had breakfast) and another at 11 AM (right before the children had lunch). It was found that during the movie shown at 11 AM, more crackers were eaten than during the movie shown at 8 AM. The investigators concluded that the different types of movies had an effect on appetite.

11. The results cannot be trusted because
- A) the study was not double-blind. Neither the investigators nor the children should have been aware of which movie was being shown.
  - B) the investigators were biased. They knew beforehand what they hoped the study would show.
  - C) the investigators should have used several bowls, with crackers randomly placed in each.
  - D) the time the movie was shown is a confounding variable.
12. The response variable in this experiment is
- A) the number of crackers eaten.
  - B) the different kinds of movies.
  - C) the time the movie was shown.
  - D) the bowls.
13. A study to determine whether or not a football filled with helium traveled farther when kicked than one filled with air found that, while the football filled with helium went, on average, farther than the one filled with air, the difference was not statistically significant. The response
- A) is the gas, air or helium, with which the football is filled.
  - B) does not exist without statistical significance.
  - C) is the number of kickers.
  - D) is the distance the football traveled.

One hundred volunteers who suffer from severe depression are available for a study. Fifty are selected at random and are given a new drug that is thought to be particularly effective in treating severe depression. The other 50 are given an existing drug for treating severe depression. A psychiatrist evaluates the symptoms of all volunteers after four weeks in order to determine if there has been substantial improvement in the severity of the depression.

14. The factor in the study above is
- A) which treatment the volunteers receive.
  - B) the use of randomization and the fact that this was a comparative study.
  - C) the extent to which the depression was reduced.
  - D) the use of a psychiatrist to evaluate the severity of depression.

AP Statistics Ch. 5 Practice Multiple Choice Questions

15. The study described above would be double-blind if
- A) neither drug had any identifying marks on it.
  - B) all volunteers were not allowed to see the psychiatrist nor the psychiatrist allowed to see the volunteers during the session during which the psychiatrist evaluated the severity of the depression.
  - C) neither the volunteers nor the psychiatrist knew which treatment any person had received.
  - D) all of the above.
16. Referring to the study described above, suppose volunteers were first divided into men and women, and then half of the men were randomly assigned to the new drug and half of the women were assigned to the new drug. The remaining volunteers received the other drug. This would be an example of
- A) replication.
  - B) confounding. The effects of gender will be mixed up with the effects of the drugs.
  - C) a block design.
  - D) a matched-pairs design.
17. A stratified random sample corresponds to which of the following experimental designs?
- A) a block design.
  - B) a double-blind experiment.
  - C) an experiment with a placebo.
  - D) a confounded, nonrandomized study.
18. A basketball player makes  $\frac{2}{3}$  of his free throws. To simulate a single free throw, which of the following assignments of digits to making a free throw are appropriate?
- A) 0 and 1 correspond to making the free throw and 2 corresponds to missing the free throw.
  - B) 01, 02, 03, 04, 05, 06, 07, and 08 correspond to making the free throw and 09, 10, 11, and 12 correspond to missing the free throw.
  - C) Both (a) and (b) are correct.
  - D) Neither (a) nor (b) is correct.

To simulate a toss of a coin we let the digits 0, 1, 2, 3, and 4 correspond to a head and the digits 5, 6, 7, 8, and 9 correspond to a tail. Consider the following game: We are going to toss the coin until we either get a head or we get two tails in a row, whichever comes first. If it takes us one toss to get the head we win \$2, if it takes us two tosses we win \$1, and if we get two tails in a row we win nothing. Use the following sequence of random digits:

12975 13258 45144  
~~12~~ ~~13~~ ~~25~~ ~~84~~ ~~51~~ ~~44~~

19. The estimated probability of winning \$2 in this game is
- A)  $\frac{1}{4}$ .
  - B)  $\frac{5}{15}$ .
  - C)  $\frac{7}{11}$ .
  - D)  $\frac{9}{15}$ .

~~2~~ - 1, 2, 3, 2, 4, 4, 4  
~~1~~ - (5, 1), (5, 1)

games = 11

20. The estimated probability of winning nothing is
- A)  $\frac{1}{2}$ .
  - B)  $\frac{2}{11}$ .
  - C)  $\frac{6}{15}$ .
  - D)  $\frac{7}{11}$ .

(9, 7) only 2  
 (5, 8)

The following multiple choice questions will haunt you until you can actually do them! Why don't you learn how to do these, and then your multiple choice test score will go up!

1. If the mean of a set of data is equal to the median, then

a) the data are normally distributed (can only say if data follows empirical rule).

b) the data are approximately distributed

c) the distribution is skewed

Best Answer

d) the distribution is approximately symmetric

2. Suppose that the scatterplot of log Y on X produces a linear plot with a correlation close to 1. Which of the following is true?

I. the correlation between the variables X and Y will also be close to 1.

II. The residual plot of Y on X will show a clearly curved pattern of points.

III. The ratio between consecutive values of y for equal x-intervals is approximately constant.

a) I only

b) II and III only

c) I and II only

d) III only

e) II only

f) I, II, III

3. The five-number summary of the distribution of scores on a statistics exam is {0, 26, 31, 36, 50}. 316 students took the exam. The histogram of all 316 test scores was approximately normal. Thus the variance of test scores must be about

a) 5

b) 8

c) 19

d) 25

e) 55

f) 64

$$z = \frac{26 - 31}{\sigma} \quad \left| \quad \begin{array}{l} \sigma = 7.4627 \\ \sigma^2 \approx 55 \end{array} \right.$$

$$-0.67 = \frac{-5}{\sigma}$$

4. A medical researcher collects health data on many women in each of several countries. One of the variables measured for each woman in the study is her weight (in pounds). The following list gives the five-number summary for the weights of the women in one of the countries {100, 110, 120, 160, 200}

Med Max

About what percentage of these women weigh between 120 & 200 pounds?

a) 25%

b) 45%

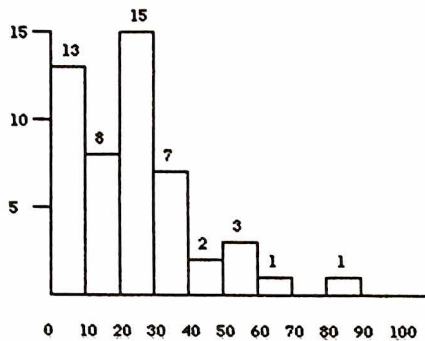
c) 50%

d) 65%

e) 75%

f) 85%

5. The following is a histogram showing the actual frequency of the closing prices on the New York exchange of a particular stock. Based on the frequency histogram for New York Stock exchange, the class that contains the 60<sup>th</sup> percentile is:



- a) 10-20                      **b) 20-30**                      c) 30-40  
 d) 40-50                      e) 50-60                      f) 60-70

6. Suppose that sixteen-ounce bags of chocolate chips are produced with an actual mean weight of 16.1 ounces and a standard deviation of 0.1 ounce. Approximately what percentage of the bags will likely be underweight (less than 16 ounces)?

- a) 5                      b) 10                      **c) 16**  
 d) 34                      e) 60                      e) 78

$$Z = \frac{16 - 16.1}{0.1}$$

$$Z = -1$$

7. If the median of a set of data is equal to the mean then,

- a) the data are normally distributed  
 b) the data are approximately distributed  
 c) the data are skewed left  
**d) the data are approximately symmetric**  
 e) the data are skewed right

8. The area under the standard normal curve corresponding to  $-0.3 < Z < 1.6$  is

- a) 0.327                      b) 0.471                      **c) 0.563**  
 d) 0.672                      e) 0.761                      f) 0.954



1. In the United States, most of the chicken eaten comes from commercial farms where living conditions can be tightly controlled. Of interest to those that raise these chickens is the effect of diet on growth—larger chickens can be sold for more money! A group of 578 chicks (all born around the same time; all tagged with a tracking number at birth) were fed one of four different protein-enhanced diets. The mass of each chick was measured every day for 20 days.

(a) Is this an experiment or an observational study? Explain.

⊛ Experiment - treatment (diet) is imposed

(b) What is the population? What is the sample?

total chickens      578 chicks

(c) Describe how the handlers should choose which diet to feed to each chick.

Random Digit Table: Assign labels 001-578, skip 000 and 579-999,  
No repeats, Read line with triple digits,  
Stop when chicks placed into diet A, B, C, or D.

2. A graduate student performs a study to determine whether a new activity-based method is better than the traditional lecture of teaching statistics. He found two teachers to help him in his study for one semester. Mr. Dull volunteered to continue teaching with traditional lectures and Ms. Perky agreed to try the new activity-based method. Each teacher planned to teach two sections of approximately forty students each for adequate replication. At the end of the semester, all sections would take the same final exam and their scores would be compared. What is the treatment variable in this study?

(a) Teacher

(b) Course Section

(c) Teaching Method

(d) Final Exam Score

3. The dentists in a dental clinic would like to determine if there is a difference between the number of new cavities in people who eat an apple a day and in people who eat less than one apple a week. They are going to conduct a study with 50 people in each group. Fifty clinic patients who report that they routinely eat an apple a day and 50 clinic patients who report that they eat less than one apple a week will be identified. The dentists will examine the patients and their records to determine the number of new cavities the patients have had over the past two years. They will then compare the number of new cavities in the two groups.

(a) Why is this an observational study and not an experiment?

Observational Study - no treatment is imposed.

- (b) Explain the concept of confounding in the context of this study. Include an example of a possible confounding variable.

Diet - people who eat an apple a day tend to watch what they eat (they take care of themselves).

- (c) If the mean number of new cavities for those who ate an apple a day was statistically significantly smaller than the mean number of new cavities for those who ate less than one apple a week, could one conclude that the lower number of new cavities can be attributed to eating an apple a day? Explain.

No! correlation  $\neq$  causation. (lurking variables)

4. A local high school posted a Winterfest theme poll on its website. Students were asked to choose one of the selected themes. The choices were (1) Under the Sea, (2) Around the World, and (3) Welcome to the Jungle. More than 2,000 students participated, and about 77% selected theme #3.

- (a) Identify the population and the sample for this problem.

Population - local high school students.

Sample - the students that choose to participate in poll.

- (b) Describe how you would simulate an SRS of 20 students, if the actual percentage of students who chose theme #3 is 80%.

Random Digit Table: Assign 00-79 for theme #3, Assign 80-99 for themes #1 and #2, No skips, repeats, Read line 115 (double-digits), Stop when 20 are selected.

- (c) Beginning at Line 115 in the random digit table, simulate an SRS of 20 students who answered the poll. What is the proportion  $p$  of students in the sample who selected theme #3?

$$\frac{15}{20} \rightarrow 75\%$$

$$\underline{p = 0.75}$$



NAME Mr. Morton Date \_\_\_\_\_ Block \_\_\_\_\_

1. Twenty men and 20 women with high blood pressure were subjects in an experiment to determine the effectiveness of a new drug in lowering blood pressure. Ten of the 20 men and 10 of the twenty women were chosen at random to receive the new drug. The remaining 10 men and 10 women received a placebo. The change in blood pressure was measured for each subject. The design of this experiment is

- A. Completely randomized with one factor, drug.
- B. Completely randomized with one factor, gender.
- C. Randomized block, blocked by drug and gender.
- D. Randomized block, block by drug.
- E. Randomized block, blocked by gender. *Two treatments!*

2. A large elementary school has 15 classrooms, with 24 children in each classroom. A sample of 30 children is chosen by the following method.

Each of the 15 teachers selects 2 children from his or her classroom to be in the sample by numbering the children from 1 to 24, then using a random digit table to select two different random numbers between 01 and 24. The 2 children with those numbers are in the sample.

Did this procedure give a simple random sample of 30 children from the elementary school?

- A. No, because the teachers were not selected randomly.
- B. No, because not all possible groups of 30 children had the same chance of being chosen. *Stratified!*
- C. No, because not all children had the same chance of being chosen.
- D. Yes, because each child had the same chance of being chosen.
- E. Yes, because the numbers were assigned randomly to the children.

3. The primary reason for using blocking when designing an experiment is to reduce

- A. The sensitivity of the experiment.
- B. Variation. *pg. 303*
- C. The need to randomize.
- D. Bias.
- E. Confounding.

4. Which of the following can be used to show a cause-and-effect relationship between two variables?

- A. A census.
- B. A controlled experiment.
- C. An observational study.
- D. A sample survey.
- E. A cross-sectional survey.

5. To check the effect of cold temperature on the elasticity of two brands of rubber bands, one box of Brand A and one box of Brand B rubber bands are tested. Ten bands from the Brand A box are placed in a freezer for two hours and ten bands from the Brand B box are kept at room temperature. The amount of stretch before breakage is measured on each rubber band, and the mean for the cold bands is compared to the mean for the others. Is this a good experimental design?

- A. No, because the means are not proper statistics for comparison.
- B. No, because more than two brands should be tested.
- C. No, because more temperatures should have been tested.
- D. No, because temperature is confounded with brand.
- E. Yes.

6. The Physician's Health Study, a large medical experiment involving 22,000 male physicians, attempting to determine whether aspirin could help prevent heart attacks. In this study, one group of about 11,000 physicians took an aspirin every other day, while a control group took a placebo. After several years, it was determined that the physicians in the group that took aspirin had significantly fewer heart attacks than the physicians in the control group. Which of the following statements explains why it would not be appropriate to say that everyone should take an aspirin every other day?

- I. The study included only physicians, and different results may occur in individuals in other occupations.
- II. The study included only males and there may be different results for females.
- III. Although taking aspirin may be helpful in preventing heart attacks, it may be harmful to some other aspects of health.

- A. I only
- B. II only
- C. III only

D. II and III only *Is occupation really a factor?*

E. I, II, and III

7. The student government at a high school wants to conduct a survey of student opinion. It wants to begin with a sample random sample of 60 students. Which of the following survey methods will produce a simple random sample?

- A. Survey the first 60 students to arrive at school in the morning.
- B. Survey every 10<sup>th</sup> student entering the school library until 60 students were surveyed.
- C. Use random numbers to choose 15 each of first-year, second-year, third-year, and fourth-year students.
- D. Number the cafeteria seats. Use a table of random numbers to choose seats and interview the students until 60 students have been interviewed.
- E. Number the students in the official roster. Use a table of random numbers to choose 60 students from this roster for the survey.

8. Which of the following variables is a continuous numerical variable? *measure*

- A. The number of cookies in a box.
- B. The shoes sizes of the students in a class.
- C. The weight of each student in a class.
- D. Your favorite color.
- E. The number of windows in a building.

9. Which of the following variables is a discrete numerical variable? *count*

- A. The length of a car.
- B. The weight of a new baby.
- C. The air pressure in a tire.
- D. The number of keys on a computer keyboard.
- E. The time required for someone to run a mile.

10. The primary reason for using randomizing when performing an experiment is to reduce

- A. Confounding variables.
- B. Bias.
- C. Variation.
- D. Measurement errors.
- E. Lurking variables.