MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) In order to assess the effects of exercise on reducing cholesterol, a researcher sampled 50 people from a local gym who exercised regularly and 50 people from the surrounding community who did not exercise regularly. They each reported to a clinic to have their cholesterol measured. The subjects were unaware of the purpose of the study, and the technician measuring the cholesterol was not aware of whether subjects exercised regularly or not. This is:

   A) an observational study
   B) an experiment, but not a double-blind experiment
   C) a double-blind experiment
   D) a matched-pairs experiment

2) 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) stratified sampling design
   B) an observational study,
   C) an experiment
   D) block design

Use the following to answer questions 3-4:
A television station is interested in predicting whether voters in its viewing area are in favor of federal funding for abortions. It asks its viewers to phone in and indicate whether they support/are in favor of or are opposed to this. Of the 2241 viewers who phoned in, 1574 (70.24%) were opposed to the federal funding for abortions.

3) Referring to the information above, the viewers who phoned in are:

   A) a convenience sample
   B) a probability sample
   C) a population
   D) a voluntary response sample

4) Referring to the information above, the sample obtained is:

   A) probably biased
   B) a simple random sample
   C) a census
   D) a single-stage sample

5) 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 sampling
   D) a census
6) Choose a simple random sample of size three from the following employees of a small company.


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

Referring to the information above, the simple random sample is:

A) 1  1  7
B) Bechhofer, then Bechhofer again, then Taylor
C) Bechhofer, Taylor, Weiss
D) Kesten, Kiefer, Taylor

7) 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 random sample of 45 women. This is an example of a:

A) block design
B) double-blind simple random sample
C) randomized comparative experiment
D) stratified random sample

8) 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 of 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) multistage sampling
C) stratified random sampling
D) convenience sampling

9) A simple random sample of 1200 adult Americans is selected, and each person is asked the following question:

In light of the huge national deficit, should the government at this time spend additional money to establish a national system of health insurance?

Only 39% of those responding answered yes. This survey:

A) is reasonably accurate since it used a large, simple random sample.
B) probably overstates the percentage of people that favor a system of national health insurance.
C) probably understates the percentage of people that favor a system of national health insurance.
D) is very inaccurate, but neither understates nor overstates the percentage of people that favor a system of national health insurance. Since simple random sampling was used, it is unbiased.

10) A call-in poll conducted by USA Today concluded that Americans love Donald Trump. USA Today later reported that 5640 of the 7800 class 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.
11) Which of the following is **not** a major principle of experimental design?

A) control  B) replication  C) segmentation  D) randomization

12) 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 the 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. 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.

13) Two variables in a study are said to be confounded if:

A) one cannot separate their effects on a response variable.
B) they are highly correlated.
C) they do not have a normal distribution.
D) one of them is a placebo.

14) 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. The factor in the study is:

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

15) Which of the following describes a double-blind study based on the scenario presented in #14?

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) Will a fluoride mouthwash used after brushing reduce cavities? Twenty sets of twins were used to investigate this question. One member of each set of twins used the mouthwash after each brushing, the other did not. After six months, the difference in the number of cavities of those using the mouthwash was compared with the number of cavities of those who did not use the mouthwash. This experiment uses:

A) random placebos  B) double-blinding
C) double replication  D) a matched-pairs design
17) A researcher conducts a study to investigate the effect of exercise and diet on mood. The factors in this study are:

A) whether randomization and placebos were used.
B) whether the experiment was double-blind.
C) exercise and diet.
D) the number of subjects.

18) A stratified random sample corresponds to which of the following experimental designs?

A) block design  B) a double-blind experiment  C) an experiment with a placebo  D) a confounded, nonrandomized study

19) To simulate a basketball player who makes 75% of his free throws, we use the digits 1, 2, and 3 to correspond to making the free throw and the digit 4 to correspond to missing the free throw. Assume successive shots are independent and we obtain the following sequence of 10 random digits: 19223 95034

Using these digits, the relative frequency of missing a free throw is:

A) 1/10  B) 5/10  C) 1/6  D) 5/6

20) 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 54144

The estimated probability of winning $2 in this game is:

A) 1/4  B) 5/15  C) 7/11  D) 9/15