1. What characteristics does a scientific hypothesis have? Select the <u>TWO</u> answers that are correct.
   A) The hypothesis is something that can be tested.
   B) The hypothesis contains a supernatural element.
   C) The hypothesis could be proven false.
   D) The hypothesis is based on an opinion.
   E) The hypothesis has already been proven correct.

2. Which example describes the set-up of a controlled experiment?
   A) Ten subjects receive a new drug and another ten subjects receive a sugar pill.
   B) Twenty subjects with knee pain receive the same treatment to relieve joint pain.
   C) A doctor treats one subject for a disease and observes how quickly the patient recovers.
   D) Researchers collect lifestyle data from fifty questionnaires submitted by subjects with the same disease.
   E) Fifteen subjects with the common cold take a cold medicine and answer questions about its effects.

Answer Key

1. A, C
2. A

1. What did the researchers conclude about how caffeine consumption affects memory function from the experiment?
   A) Caffeine improves memory function in elderly people.
   B) Decaffeinated coffee worsens memory function in elderly people.
   C) Caffeine has no effect on memory function in elderly people.
   D) Elderly people should drink coffee in the afternoon to boost memory function.
   E) Elderly people have poorer memory function in the afternoon as compared to young adults.

2. Using the same independent and dependent variables as in the first experiment, researchers could extend the studies to test which of the following hypotheses? Select the TWO answers that are correct.
   A) Caffeine improves memory function in elderly people when consumed at least two hours before testing.
   B) Caffeine does not improve memory function in women aged 20 to 40.
   C) The risk of developing cancer in advanced age increases with caffeine consumption.
   D) Antioxidant-rich foods improve memory function in men and women over the age of 65.
   E) Young adults between the ages of 18 and 25 are less likely to drink coffee than elderly adults.

Answer Key

1. A
2. A, B

1. Why is sample size important?
    A) Statistical significance is best achieved with a small sample size.
    B) Larger sample size increases the likelihood that the results of a study are not due to random chance.
    C) Relationships between variables can be determined only using a large sample size.
    D) Researchers will always draw the right conclusions about a set of data if the sample size is large enough.
    E) Legitimate scientific studies can be performed using only a large sample size.

2. Anna is majoring in public health. She is designing an epidemiological study to examine the relationship between alcohol consumption and academic performance at her university. In addition to ensuring that she has a large enough sample size, what strategy should she take to make sure her conclusions are accurate?
    A) give the survey to the students that are most likely to respond because they carry a smaller course load
    B) target the surveys to the students that are involved in the designated driver campaign on campus
    C) randomly survey a group of participants that are representative of the general student body
    D) give the surveys out to members of the student groups known for throwing the wildest parties on campus
    E) hand out the survey only to friends and to fellow students enrolled in public health classes

Answer Key

1. B
2. C

1. Which statement describes a correlation between two variables?
   A) Correlated variables strongly imply their change is caused by a third, perhaps unknown, variable.
   B) Correlated variables are dependent; how they change is predicted by change in a third unknown variable.
   C) Correlated variables are interdependent; as one varies so does the other in a predictable fashion.
   D) Correlated variables are independent; how one varies does not have an effect on how the other varies.
   E) Correlated variables demonstrate causality; change in the independent variable directs change in the dependent variable.

2. Which statements describe the relationship between correlation and causation? Select the TWO answers that are correct.
   A) Correlation alone is not sufficient evidence to attribute causation.
   B) Strong correlations among variables are evidence of causation by the independent variable.
   C) Either variable might be the cause, or both variables might be influenced by a third unknown variable.
   D) When two variables correlate, it strongly implies that a third unknown variable is the causal factor.
   E) When a correlation has a high probability, it strongly implies causation.

Answer Key

1. C
2. A, C