Inquiry CFA #1

Student Name: ________________________________ Date: __________

Teacher Name: Jasmine Straughter Score: __________

1)

![Bird Population Graph]

If the bird population is directly proportional to the average monthly temperature, which month would have the LOWEST temperature?

A) August  
B) December  
C) January  
D) October

2) Janine and Rodney want to determine who has the fastest growing puppy. They take the weight of the dogs every day for 6 months and feed them the same amount and type of Puppy Chow during this time. Which graph type would be BEST used to determine which dog has the FASTEST growth rate?

A) bar graph  
B) pie chart  
C) line graph  
D) pictograph

3)
According to the graph, when does the bacteria population reach its peak?

A) February
B) March
C) November
D) September

4)

<table>
<thead>
<tr>
<th>Plant</th>
<th>Mass of Plant after 3 Weeks (kg)</th>
<th>Amount of Fertilizer (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.2</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0.4</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>1.2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>1.0</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Died</td>
<td>5</td>
</tr>
</tbody>
</table>

What is the dependent variable in the experiment shown?

A) death rate
B) mass of plant
C) number of plants
D) amount of fertilizer
5) A student studies the gathering of frogs at the end of a pond. She has collected data, formed graphs, and now should do what with that information?
   A) experiment
   B) author a procedure
   C) publish her findings
   D) analyze and conclude

6) How many variables should be manipulated in a correctly performed scientific experiment?
   A) one
   B) three
   C) two
   D) zero

7) Based on the graph the dependent variable is
   A) time.
   B) the number of days.
   C) the month of the year.
   D) the population of birds.

8) After reviewing the results of your science fair project, you state that water has increased the growth of fungi. This is a(n)
   A) analysis.
   B) conclusion.
   C) experiment.
   D) hypothesis.

9) Which measures the mass of an object?
   A) a spring scale (in N)
   B) a height scale (in feet)
   C) a graduated cylinder (in mL)
   D) a triple beam balance (in grams)

10) A scientist must always try to avoid __________ in scientific experiments.
    A) bias
    B) lab safety
    C) large data samples
    D) detailed procedures
11) In an experiment, a tomato plant is fertilized everyday with 0.2 g of GroBig fertilizer. The researcher wants to show the effect of daily fertilizer on plant growth. What type of graph should she use to best demonstrate this daily improvement?
   A) pie graph
   B) bar graph
   C) line graph
   D) pictograph

12) Tina conducted an experiment to test her hypothesis. Her hypothesis was that by crushing aspirin and putting it into potting soil increases the growth rate of tomato plants. The results of the experiment show that there was no significant difference in the growth rates between the control and the experimental groups. What should Tina do with the results of this experiment?
   A) Assume that there was something wrong with the aspirin or plants.
   B) Publish the results of the experiment and claim the reverse of the hypothesis is true.
   C) Assume she did the experiment incorrectly, ignore the results, and conduct the experiment again.
   D) Use the results to look at the situation in a new way, learn, and reapply it by altering the hypothesis and conduct another experiment to test her new hypothesis.
A student carries out an experiment on the growth of Aspergillus, a common fungus, in petri dishes maintained under different temperatures.

According to the table, at what temperature does this fungus grow best?

A) 20°C  
B) 25°C  
C) 40°C  
D) —10°C

14) Will notices that crickets seem to chirp more frequently at night in June than they do in October. He asks himself, "How do temperature changes affect how often crickets chirp?" If he were to perform an experiment, which of these statements would be the best hypothesis?

A) Crickets are inactive in October.  
B) Do crickets like warm weather better than cold weather?  
C) Crickets chirp more frequently as temperature increases.  
D) Crickets chirp for many reasons, and temperature is probably one reason.

15) The ______ variable in an experiment could be informally called the 'cause', while the _______ could be called the 'effect'.

A) control; dependent  
B) control; independent  
C) independent; dependent  
D) dependent; independent
Hand Washing Test

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Bacterial cultures (#/plate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm water</td>
<td>24</td>
</tr>
<tr>
<td>Hand sanitizer</td>
<td>28</td>
</tr>
<tr>
<td>Soap A</td>
<td>12</td>
</tr>
<tr>
<td>Soap B</td>
<td>13</td>
</tr>
</tbody>
</table>

In a recent experiment, anti-bacterial hand sanitizer was compared to two different anti-bacterial soaps. Students washed their hands using the products and warm water for two minutes, and then dried their hands with a paper towel. The standard of comparison was rubbing hands vigorously for 2 minutes in warm water, without any soap or sanitizer, and then drying with a paper towel. The sanitizer advertisement claimed to kill bacteria more effectively than any anti-bacterial soap. After washing, hands were swabbed and then the swab applied to a culture plate and incubated. Finally, the bacterial cultures were counted.

Based on the procedures and data, which of these is the MOST appropriate conclusion?

A) The experiment is not valid; there is no control.
B) The advertiser’s claims are true; the hand sanitizer worked best.
C) Both soaps did a better job killing bacteria than the hand sanitizer.
D) The control situation was as effective as the hand sanitizer and anti-bacterial soaps.

An apartment being treated for roaches was sprayed with a pesticide. In the graph, the number of roaches seen each day was plotted each day after the treatment. Day 0 represents the day before the apartment was treated. What can you conclude from the graph?

A) More roaches seen on day 5 than on day 1.
B) More roaches seen on day 2 than on day 19.
C) The treatment was only effective as a short-term solution.
D) The treatment was an effective long-term solution to the problem.

18) Jeanette was conducting an experiment to determine if plants grow better when exposed to rap music. She bought two identical plants and exposed one to rap music for two weeks while the other grew without music. From the data, Jeanette determined that plants do not grow better with rap music. Which of these would explain why Jeanette’s conclusion may not be valid?
   A) There was no control group.
   B) She never formulated a question.
   C) The experiment could never be repeated.
   D) She should have tested more than two plants.

19) Robert is instructed in a lab experiment to first record the ambient temperature of the room. To do this, he holds the thermometer under a bright light to accurately read it. He then reads and records the data as 33°C. What error, if any, and effect occurred when performing this lab step?
   A) The actual temperature of the room is 33°C. Robert performed the steps accurately.
   B) The actual temperature of the room is lower than 33°C. Robert misread the thermometer.
   C) The actual room temperature is lower than 33°C. The added heat from the light caused the temperature to be too high.
   D) The actual temperature of the room is higher than 33°C. Robert should have used the Fahrenheit scale, which would have registered higher.
A reporter wants to investigate the reasons for the high levels of air pollution in a locality. Initial research reveals two possible sources: an old thermal power plant and a sheet metal factory. She hands out the questionnaire above to the local residents to investigate the matter further.

What can be concluded about the results of her investigation?

A) It would help to get to the root cause of the air pollution in the locality.
B) It would help her take people’s opinions and shut down both the sources of pollution.
C) It would be biased because no questions about the sheet metal factory have been asked.
D) It would be inconclusive because there are no questions about the nature of the pollutants.

21) Josh was testing his hypothesis on increasing the rate of reaction in a chemical reaction. Josh had two trials, one at room temperature and one using a hot water bath. He compared the data from his two trials and reached a conclusion. What was the major flaw in Josh’s experimental design?

A) not conducting more trials
B) not using freezing point and boiling point
C) not using different concentrations of reactants
D) not being careful enough in making measurements

22) Mr. Villa’s class does a science experiment. His students place three vases of cut flowers in the sunlight. They pour water into the first vase of flowers. They pour soda into the second vase of flowers. They pour vinegar into the third vase of flowers. At the end of one week the students observe that the flowers in the vase of water are still alive, but the flowers in the other two vases are dead.

What can the students infer from the observations in the experiment?

A) Flowers need light to grow.
B) Vinegar makes flowers bloom.
C) Plants need water to survive.
D) Plants prefer water to soda or vinegar.
In which consecutive years did the population have the greatest decline?
A) 1999-2000
B) 2000-2001
C) 2001-2002
D) 2002-2003

24) Which tool would BEST be used for measuring the temperature of the classroom?
A) atmosphmometer
B) barometer
C) sphygmomanometer
D) thermometer
A biologist is studying the relationship between dissolved oxygen levels at various depths in a lake and the number and type of fish species found at each depth. To begin her study, the biologist has recorded dissolved oxygen readings for water samples taken from 1, 5, 10, 15, 20, 25, and 30 meters. Because of a mistake, one of the water samples was incorrectly labeled.

Which sample in the table is MOST likely to be incorrect or invalid data?

A) 5 meters  
B) 15 meters  
C) 25 meters  
D) 30 meters

What property of matter would be measured with this piece of equipment?

A) The mass of an apple.  
B) The temperature of a room.  
C) The volume of water in a glass.  
D) The length of a piece of string.