**PSYC 301 –Assignment 5**

*Spring 2022*

Name: Date:

**INSTRUCTIONS.** This assignment is worth 10 points. There are 3 extra credit points possible. Answer the following questions. When finished, hand in a hard copy of this assignment to your TA.

1. (2 points; 0.5 points each) A stats professor gives an exam that is known to have a mean of 75. She implemented a new study method and believed her students this semester will score significantly greater than 75. If the mean is significantly higher than 75, the stats professor will make the students a homemade chocolate cheesecake as a reward. If they do not score significantly higher, she will make the students run a mile.

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| --- | --- | --- |
|  | **The Truth** | |
| **Decision** | ***The students score a 75*** | ***The students score***  ***greater than 75*** |
| ***The professor makes the chocolate cheesecake*** |  | Correct Decision |
| ***The professor makes the students run a mile*** | Correct Decision |  |

* 1. In this context, what is a Type I Error?
  2. In this context, what is a Type II Error?

1. (1 point; 0.5 points each) A pharmaceutical company has developed a new drug that they claim will cure cancer.
   1. In this context, what is a Type I Error?
   2. In this context, what is a Type II Error?

(2.5 points; 0.5 points each) Using the following options, match the appropriate hypothesis with the statements below.

A. Null Hypothesis B. Alternative Hypothesis

1. A test of significance is trying to find evidence for the \_\_\_\_\_\_\_\_.
2. The claim being tested in a significance test is the \_\_\_\_\_\_\_\_.
3. A test of significance assesses the strength of evidence against the \_\_\_\_\_\_\_\_.
4. The \_\_\_\_\_\_\_\_ can predict the direction of group differences.
5. The \_\_\_\_\_\_\_\_ can state that group differences exist but does not need to predict the direction of change.

(7.5 points; 1.5 points each) For each situation, state the null and alternative hypothesis and whether it is a one- or two-tailed hypothesis.

1. Researchers have postulated that, due to differences in diet, Japanese children have a lower mean blood cholesterol level than U.S. children. Suppose that the mean level of U.S. children is known to be 170.
   1. null:
   2. alternative:
   3. one- or two-tailed:
2. A water quality control board reports that water is unsafe for drinking if the mean nitrate concentration exceeds 30 ppm. Water specimens are taken from a well.
   1. null:
   2. alternative:
   3. one- or two-tailed:
3. Last year, your company’s service technicians took an average of 2.6 hours to respond to trouble calls from business customers who had purchased service contracts. Do this year’s data show a different average response time?
   1. null:
   2. alternative:
   3. one- or two-tailed:
4. Census Bureau data show that the mean household income in the area served by a shopping mall is $42,500 per year. A market research firm questions shopper at the mall. The researchers suspect that mean household income of mall shoppers is higher than that of the general population.
   1. null:
   2. alternative:
   3. one- or two-tailed:
5. Studies conducted in the 1970s indicated that the average age at which children take their first alcoholic drink is 16 years old. Sociologists believe that children now a days are starting to drink at a different age.
   1. null:
   2. alternative:
   3. one- or two-tailed: