# Long Island University Post

# College of Management

## **MDA 525-1 Business Analytics Summer 2019**

## **Instructor: Dr. Jiamin Wang**

# Quiz 4 Due August 26

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| **Student's Name** |  |

Section I. True/False Questions (5 points)

For each of the following statements write "T" if you think it is right or "F" otherwise.

1. You cannot make a Type 1 error when there is no significant evidence to reject the null hypothesis. ( )

2. The probability of making a Type 1 error is the significance level.  ( )

3. A Type 2 error can occur only if the null hypothesis is rejected. ( )

4. If a null hypothesis is rejected at the 0.05 level of significance, it should be rejected at the 0.025 level. ( )

5. A confidence interval obtained will always enclose the true value of the population parameter it is estimating. ( )

6. The larger the *p*-value, the more we doubt the null-hypothesis. ( )

Section II. Multiple-choice Questions (7 points)

1. As the sample size \_\_\_\_\_\_, the variation of the sampling distribution of \_\_\_\_\_ . ( )

|  |  |
| --- | --- |
| A | decreases, decreases |
| B | increases, increases. |
| C | decreases, remains the same |
| D | increases, remains the same |
| E | increases, decreases |

2. The distribution of all \_\_\_\_\_ proportions is denoted by . ( )

|  |  |
| --- | --- |
| A | population |
| B | sample |
| C | random |
| D | observed |

3. In statistical inference, \_\_\_\_\_\_data are analyzed, while generalizations (inferences) are made to \_\_\_\_\_\_.  ( )

|  |  |
| --- | --- |
| A | population, sample |
| B | sample, population |
| C | population, sample statistic |
| D | parameter, population |

4. A machine's historical defective rate is 0.8%. A recent hypothesis test led the manager to conclude that the machine's current defective rate is significantly higher, with a *p*-value of 0.024. Which of the following interpretations about the *p*-value is correct? ( )

|  |  |
| --- | --- |
| A | It is the probability that the current defective rate is higher than 0.8%. |
| B | It is the probability that the null hypothesis can be rejected. |
| C | It is the probability of obtaining a sample defective rate as extreme as the one observed if the current defective rate is still 0.8%. |
| D | It is the proportion of defective units in the sample. |

5. Aviation experts fear that pilots are being asked to fly longer than is recommended by national guidelines. Current FAA regulations for domestic flights generally limit pilots to eight hours of flight time during a 24-hour period. FAA administrators conduct an analysis using a large sample of flight records for domestic flights in the past year. The average flight time is found to be 8.21hours. What are the null and alternative hypotheses appropriate for this test? ( )

|  |  |
| --- | --- |
| A |  |
| B |  |
| C |  |
| D |  |
| E |  |
| F |  |

6. Based on a random sample of 80 observations, a 95% confidence interval for the population proportion is (0.52, 0.74). Which of the following is true? Select all that apply. ( )

|  |  |
| --- | --- |
| A | The margin of error is 0.22. |
| B | A larger confidence level would yield a wider confidence interval. |
| C | The sample proportion is 0.63. |
| D | A larger sample standard deviation would yield a narrower confidence interval. |
| E | We are 95% confident that the confidence interval will include every sample proportion. |

7. In a *t*-test, the test statistic is 2.01. The investigator concludes that he should reject the null hypothesis. Which of the following scenarios does not justify the investigator’s decision? Select all that apply. ( )

|  |  |
| --- | --- |
| A | Sample size *n* = 10, *α* = 0.05, a one-sided “greater than” alternative test |
| B | Sample size *n* = 10, *α* = 0.05, a two-sided test |
| C | Sample size *n* = 20, *α* = 0.01, a one-sided “greater than” alternative test |
| D | Sample size *n* = 20, *α* = 0.10, a two-sided test |
| E | Sample size *n* = 100, *α* = 0.05, a one-sided “greater than” alternative test |