

QUIZ 3
Psychology 311

NAME: _____

STUDENT ID #: _____

This quiz covers Chapters 7, 8, and 9. There are a total of 50 possible points. Point values for each question are noted next to the question number. Although you are free to use your calculator, please remember that to receive full credit for your answers, you must show all your work (i.e., H_0 and H_1 , critical values, conclusions, etc.). When in doubt, write it out...

True/False (1 point each)

1. T F Sample means will vary from sample to sample even if all the samples are the same size and all the samples are selected from the same population.

2. T F If the null hypothesis is rejected using a one-tailed test, then it certainly would be rejected if the researcher had used a two-tailed test.

Multiple Choice (1 point each)

3. The standard error of \bar{X} provides a measure of
 - a) the maximum possible discrepancy between \bar{X} and μ .
 - b) the minimum possible discrepancy between \bar{X} and μ .
 - c) the exact amount of discrepancy between each specific \bar{X} and μ .
 - d) the average distance between \bar{X} and μ .

4. Holding everything else constant, increasing sample size
 - a) decreases standard error
 - b) increases the magnitude of the t statistic
 - c) increases degrees of freedom
 - d) all of the above

5. A researcher reports that there is a significant difference between two treatments at the .05 level of significance. This means that
 - a) if the researcher repeated the experiment, there is a 95% probability that the same decision would be reached.
 - b) the difference obtained in the experiment is at least 5% larger than the standard error.
 - c) there is a 5% probability (or less) that the difference is due to chance.
 - d) the average score for one treatment is at least 5% higher than the average score for the other treatment.

6. The critical region for a hypothesis test consists of
- a) outcomes that have a very low probability if the null hypothesis is true
 - b) outcomes that have a high probability of the null hypothesis is true
 - c) outcomes that have a very low probability whether or not the null hypothesis is true
 - d) outcomes that have a high probability whether or not the null hypothesis is true

Short Answer

7. Please describe the five steps to hypothesis testing that we discussed in class. (5 points)

Step 1:

Step 2:

Step 3:

Step 4:

Step 5:

8. Define Type I error and Type II error. (2 points)

9. A random sample of $n = 4$ scores is obtained from a normal population with $\mu = 20$ and $\sigma = 4$. What is the probability of obtaining a mean greater than $\bar{X} = 22$ for this sample? (4 points)

10. The following sample was obtained from a normal population with $\mu = 80$ and $\sigma = 12$. Find the z-score corresponding to the sample mean of $\bar{X} = 77$, where $n = 16$. (2 points)

11. For a normal population with $\mu = 100$ and $\sigma = 12$: (6 points)

a) What is the probability of obtaining a sample mean greater than 106 for a sample of $n = 4$ scores?

b) What is the probability of obtaining a sample mean greater than 106 for a sample of $n = 16$ scores?

c) Why are these probabilities different? Be specific.

12. A researcher investigates whether or not a new medication produces enough sedation to impair mental functioning. It is known that scores on a standardized test containing a variety of problem-solving tasks are normally distributed with $\mu = 64$ and $\sigma = 8$. A random sample of $n = 12$ subjects are given the drug and then tested. For this sample, the mean is $\bar{X} = 58$. Does the drug impair mental functioning? Test with $\alpha = .01$, one-tail. If there is a significant effect, determine the effect size. (7 points)

13. A study examines self-esteem and depression in children. A sample of 25 children with low self-esteem is given a standardized test for depression. The average score for the group is $\bar{X} = 93.4$, where higher scores indicate more depression. Previous studies of the population yield norms of $\mu = 90$ and $\sigma = 14$ for the depression inventory. Do students with low self-esteem show more depression? Use a one-tailed test with $\alpha = .05$. If there is a significant effect, determine the effect size. (6 points)

14. A sample of freshman takes a reading comprehension test. If the mean for the general population on this test is $\mu = 12$, can you conclude that this sample is significantly different from the population? Test with $\alpha = .05$. If there is a significant effect, determine the effect size. (6 points)

Scores: 16 8 8 6 9 11 13 9 10

15. The average job satisfaction level in a population of employees is $\mu = 25$. After announcing that 10% of the workforce will be laid off, a sample of workers yields the following levels of job satisfaction. Is there evidence that announcement of layoffs influences job satisfaction? Use an alpha level of .05. If there is a significant effect, determine the effect size. (6 points)

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