Hypothesis Testing Quiz Answer Key PDF

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What is the primary purpose of hypothesis testing?

A. To prove a hypothesis

B. To evaluate a hypothesis using sample data ✓

C. To collect data

D. To determine the sample size

Which factors affect the power of a test? (Select all that apply)

A. Sample size ✓

B. Significance level ✓

C. Effect size ✓

D. Population variance

Which test is typically used when the sample size is large and the population variance is known?

A. T-test

B. Z-test ✓

C. Chi-square test

D. F-test

Which of the following represents the null hypothesis?

A. H1

B. Ha

C. H0 ✓

D. H2

What does the power of a test refer to?

A. The probability of rejecting a true null hypothesis
B. The probability of accepting a false null hypothesis
C. The probability of correctly rejecting a false null hypothesis ✓
D. The probability of making a Type I error

What is the common significance level used in hypothesis testing?

A. 0.01
B. 0.05 ✓
C. 0.10
D. 0.50

What does a p-value represent in hypothesis testing?

A. The probability of the null hypothesis being true
B. The probability of obtaining a test statistic at least as extreme as the one observed ✓
C. The probability of a Type II error
D. The probability of a Type I error

Which of the following is an assumption of hypothesis testing?

A. Data must be categorical
B. Data must be skewned
C. Data should be normally distributed ✓
D. Data should be ordinal

Provide an example of a real-world scenario where hypothesis testing could be applied and explain the process.

A. In clinical trials, hypothesis testing can determine if a new drug is more effective than a placebo by comparing outcomes. ✓
B. In market research, hypothesis testing can determine customer preferences.
C. In quality control, hypothesis testing can assess product defects.
D. In education, hypothesis testing can evaluate teaching methods.

Explain the difference between a one-tailed and a two-tailed hypothesis test.

A. A one-tailed test looks for an effect in one direction, while a two-tailed test considers both directions. ✓

B. A one-tailed test considers both directions, while a two-tailed test looks for an effect in one direction.

C. A one-tailed test is more powerful than a two-tailed test.

D. A two-tailed test is only used for large sample sizes.

Describe the steps involved in conducting a hypothesis test.

A. Formulate hypotheses, choose significance level, determine test statistic, calculate p-value, make a decision. ✓

B. Collect data, analyze results, draw conclusions.

C. Choose significance level, conduct experiment, report findings.

D. Determine sample size, formulate hypotheses, analyze data.

Why is it important to choose an appropriate significance level in hypothesis testing?

A. It balances the risk of Type I errors and the sensitivity of the test. ✓

B. It determines the sample size needed for the test.

C. It affects the type of test used.

D. It has no impact on the results of the test.

What are potential outcomes of a hypothesis test? (Select all that apply)

A. Reject the null hypothesis ✓

B. Accept the null hypothesis

C. Fail to reject the null hypothesis ✓

D. Proved the alternative hypothesis

Which errors are possible in hypothesis testing? (Select all that apply)

A. Type I error ✓

B. Type II error ✓

C. Type III error

D. Type IV error

How can the assumptions of normality and independence impact the results of a hypothesis test?

A. Violations can lead to inaccurate results, affecting the validity of the test. ✓

B. It has no impact on the results of the test.
C. It only affects the power of the test.
D. It can lead to underestimating the effect size.

Discuss the implications of making a Type II error in a medical research study.

A. It could lead to missing a potentially effective treatment, affecting patient outcomes. ✓
B. It results in false positives, leading to unnecessary treatments.
C. It has no impact on patient outcomes.
D. It can lead to overestimating the effectiveness of a treatment.

In which scenarios would you use a chi-square test? (Select all that apply)

A. Comparin means of two groups
B. Testing independence in a contingency table ✓
C. Testing goodness of fit ✓
D. Analyzing categorical data ✓

What is a Type I error in hypothesis testing?

A. Accepts a false null hypothesis
B. Rejects a true null hypothesis ✓
C. Accepts a true alternative hypothesis
D. Rejects a false alternative hypothesis

What are the assumptions of a t-test? (Select all that apply)

A. Normality ✓
B. Homogeneity of variances ✓
C. Independence of observations ✓
D. Large sample size

Which of the following are types of hypothesis tests? (Select all that apply)

A. Z-test ✓
B. T-test ✓
C. Chi-square test ✓

D. Regression test