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MCQ ASSIGNMENR PFA FILE 1

1.The correct answer is:

d) Expected

In the context of goodness of fit tests, such as the chi-square test, we compare observed frequencies (those obtained from actual data) with expected frequencies (those that would be expected if the null hypothesis were true). The goodness of fit test assesses whether the observed frequencies differ significantly from the expected frequencies. Therefore, “expected” frequencies are the frequencies we compare the observed frequencies against to evaluate the fit of the data to a particular distribution or hypothesis.

2.c) Frequencies

The chi-square test is specifically used to analyze frequencies or counts within categorical data. It assesses whether there is a significant association between the categories of two or more variables or whether the observed frequencies differ significantly from the expected frequencies. It is not used to analyze scores or ranks directly, but rather to test the distribution of categorical data. Therefore, option (c) is the correct answer.

3. The mean (expected value) of a Chi-Square distribution with

k

K degrees of freedom is

k

k.

In this case, the question asks for the mean of a Chi-Square distribution with 6 degrees of freedom. Therefore, the correct answer is:

c) 6

This corresponds to the fact that the mean of a Chi-Square distribution is equal to its degrees of freedom.

4.The distribution that is typically used for goodness of fit testing is:

b) Chi-squared distribution

Goodness of fit tests, such as the chi-squared test, rely on the chi-squared distribution to assess whether observed data follow an expected distribution or pattern. This distribution arises naturally when comparing observed frequencies with expected frequencies in categorical data analysis.

5.

The correct answer is:

c) F Distribution

Explanation:

Among the options given:

Binomial Distribution (a) is a discrete distribution that describes the number of successes in a fixed number of independent Bernoulli trials.

Hypergeometric Distribution (b) is a discrete distribution that describes the number of successes in a sample drawn without replacement from a finite population.

Poisson Distribution (d) is a discrete distribution that describes the number of events occurring in a fixed interval of time or space.

The F Distribution (c) is the only continuous distribution among the options. It is used in statistics for hypothesis testing, particularly in the analysis of variance (ANOVA) and regression analysis. It arises when testing the ratio of variances or testing the equality of two means from normally distributed populations.

6.The correct answer is:

b) Hypothesis

Explanation:

In statistics, a statement or assumption made about a population is called a hypothesis. Hypotheses are used in statistical testing to formally state what we are testing and to guide the analysis of data. They are typically formulated as null hypotheses (H_0) and alternative hypotheses (H_1), and they help us determine whether there is enough evidence to reject or not reject the null hypothesis based on the observed data.

Here's a brief overview of the other terms listed:

Statistic (a): A statistic is a characteristic or measure obtained from a sample, such as the sample mean or sample standard deviation.

Level of Significance (c): The level of significance (α) is the probability threshold used to determine whether to reject the null hypothesis. It is typically set before conducting a test.

Test Statistic (d): A test statistic is a numerical value calculated from sample data that is used to decide whether to reject the null hypothesis in a hypothesis test.

Therefore, the correct term for a statement made about a population for testing purposes is hypothesis (option b).

7. The correct answer is:

a) Null Hypothesis

Explanation:

In hypothesis testing, the null hypothesis (H_0) is the statement or assumption that we test against the alternative hypothesis (H_1). The null hypothesis is typically the hypothesis of no effect or no difference. It represents the status quo or the assumption that there is no relationship or effect between variables in the population.

When we test the null hypothesis, we are considering it to be true until we have sufficient evidence to reject it. The process involves evaluating whether the observed data provide enough evidence to reject the null hypothesis in favor of the alternative hypothesis.

To summarize the other options for clarity:

Statistical Hypothesis (b): This term is not commonly used in the context of hypothesis testing; hypotheses are typically referred to as null hypotheses or alternative hypotheses.

Simple Hypothesis (c): This refers to a hypothesis that specifies a particular value for a parameter, as opposed to a range of values (which would be a composite hypothesis).

Composite Hypothesis (d): This refers to a hypothesis that specifies a range of possible values for a parameter, rather than a single specific value.

Therefore, the correct term for testing a hypothesis assuming it to be true until proven otherwise is the null hypothesis (option a).

8.The correct answer is:

a) Two tailed

Explanation:

In hypothesis testing, the critical region (or rejection region) is the set of all possible sample outcomes that lead to rejection of the null hypothesis.

Two-tailed test: This occurs when the critical region is divided equally into two parts, one in each tail of the distribution of the test statistic. This type of test is used when the

alternative hypothesis does not specify the direction of the difference or effect (i.e., it could be different in either direction).

One-tailed test: This occurs when the critical region is located entirely in one tail of the distribution of the test statistic. It is used when the alternative hypothesis specifies a direction of the difference or effect (e.g., greater than or less than a certain value).

Three-tailed test: This term is not commonly used. In general practice, hypothesis tests are typically classified as one-tailed or two-tailed depending on the location of the critical region.

Zero-tailed test: This term is not standard in hypothesis testing terminology. Tests are generally classified based on the number of tails (one-tailed or two-tailed).

Therefore, if the critical region is evenly distributed between the two tails of the distribution of the test statistic, the test is referred to as a two-tailed test (option a).

9.: The correct answer is:

b) Research Hypothesis

Explanation:

The alternative hypothesis (H_1) is also referred to as the research hypothesis. It is the statement that researchers are trying to find evidence for during hypothesis testing. The alternative hypothesis typically suggests that there is an effect or relationship in the population, contrasting with the null hypothesis (H_0), which states that there is no effect or relationship.

Here's a brief explanation of the other options:

Composite hypothesis (a): This refers to a hypothesis that specifies a range of possible values for a parameter, rather than a single specific value.

Simple hypothesis (c): This refers to a hypothesis that specifies a particular value for a parameter, as opposed to a range of values (which would be a composite hypothesis).

Null hypothesis (d): This is the hypothesis that is tested against the alternative hypothesis. It typically represents the status quo or the assumption of no effect or no difference.

Therefore, the alternative hypothesis is also known as the research hypothesis (option b), as it represents the hypothesis that researchers are interested in proving or finding evidence for during their study.

10.A