Reading 9

PARAMETRIC AND NON-PARAMETRIC TESTS OF INDEPENDENCE

1. (A) chi-square statistic.

Explanation

A test for independence based on contingency table data uses a chi-square statistic.

(Module 9.1, LOS 9.b)

2. (C) sum of squared differences between each table cell's actual value and its expected value, if the two characteristics are independent.

Explanation

The chi-square statistic for a test of independence based on contingency table data is the sum of squared differences between each table cell's actual value and its expected value, if the two characteristics are independent.

(Module 9.1, LOS 9.b)

3. (A) 2.048.

Explanation

The test statistic for a hypothesis test concerning population correlation follows a t-distribution with n − 2 degrees of freedom. For a sample size of 30 and a significance level of 5%, the sample statistic must be greater than 2.048 or less than −2.048 to reject the hypothesis that the population correlation equals zero.

(Module 9.1, LOS 9.a)

4. (C) contingency tables.

Explanation

A hypothesis test whether of two categorical variables (e.g., company sector and bond rating) are independent can be performed by constructing a contingency table and calculating a chi-squared statistic.

(Module 9.1, LOS 9.b)

5. (B) product of the number of rows minus one and the number of columns, minus one.

Explanation

Degrees of freedom for a test for independence are [(r – 1) (c – 1)], where r and c are the number of rows and the number of columns in the contingency table.

(Module 9.1, LOS 9.b)

6. (A) Yes

Explanation

The t-statistic for a test of the population correlation coefficient is $\frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$, where r is the sample correlation coefficient and n is the sample size.

(Module 9.1, LOS 9.a)

7. (C) t-distribution with n − 2 degrees of freedom.

Explanation

The test statistic for the significance of the correlation between two random variables follows a t-distribution with n − 2 degrees of freedom.

(Module 9.1, LOS 9.a)

8. (C) at a 5% significance level, but not at a 2% significance level.

Explanation

With 19 − 2 = 17 degrees of freedom, the critical values are plus-or-minus 2.110 at a 5%significance level, 2.567 at a 2% significance level, and 2.898 at a 1% significance level. Because the t-statistic of −2.5433 is less than −2.110, the hypothesis can be rejected at a5% significance level. Because the t-statistic is greater than −2.567, the hypothesis cannot be rejected at a 2% significance level (or any smaller significance level).

(Module 9.1, LOS 9.a)