**Solutions:**

**1.**

The expected frequency count of male Independents is Row total of male *×* Column total of independent = 400 *×* 100 = 40*.*

Table total

**2.**

1000

Here we test H0: The dogs have no preferences among the brands vs. H1: They have preferences.

Under H0, the expected frequency for each brand should be 150*/*3 = 50.

The observed frequencies for brands A, B and C respectively are 62, 43 and 45.

2 2 2

Hence, Chi2 = (62*−*50) + (43*−*50)

(45*−*50)

50 50 +

50 = 4*.*36 with degrees of freedom 2.

The critical value of chi-square distribution with df=2 at 10% level is 4.605.

As 4*.*36 *<* 4*.*605, we do not reject H0. So, there is not sufficient evidence at the 10% level that the dogs have preferences among the brands.

**3.**

From the table of margin of error for sample sizes, we see to find the answer to within 3% at the 95% confidence level, one should take a sample of size 1068.

**4.**

Claim I is false, because rejection at 10% level guarantees rejection at any higher levels, but does not guarantee rejection at any lower level.

Claim II is true, because p-value is the probability of the test statistic being more extreme with respect to the null hypothesis, and hence if p-value is more than the significance level, intuitively it is clear that the test statistic is not enough far from its value under the null hypothesis.

Claim III is false. The value of the test statistic does not depend on the level of the test. So, option (B) is answer.

**5.**

Option (E) is the answer. If p-value of the test is less than the level, we reject H0. All

other given conditions are not true.

**6.**

1

The event can occur, but only once out of 1000 trials. So, it is unlikely to occur. Option

(A) is the answer.

**7.**

Normality, constant (error) variance and error terms with a mean of zero (from normal equation) are assumptions in the simple linear regression model, whereas variance of 1 is not an assumption.

**8.**

For a given hypothesis test, if we do not reject H0, and H0 is true, then no error has been committed. Type I error is rejecting a true hypothesis, type II error is accepting a false hypothesis and type III error is correctly rejecting the null hypothesis for the wrong reason. **9.**

As sample size increases, the standard error (s.e.) of the estimate decreases. Confidence interval (CI) limits are directly proportional to s.e. So, with increase in sample size, CI decreases. Also, as confidence level decreases, the critical value of the test decreases. Con- fidence interval (CI) limits are directly proportional to the critical value. So, with decrease in sample size, CI decreases. Answer is (c).

**10.**

For siple linear regression, *r*2 denotes the proportion of total variance explained by the regression, whereas the rest of the variation is considered due to error. As among the two models, *r*2 for Model I is larger, the SSE for Model I is lower. Also, as model I explains more variability than model II, a Prediction based on Model I is likely better than a prediction based on Model II.

**11.**

As the data distributions is assumed to be fairly symmetric, we assume the distribution is normal. Now the interval (6,24) is sample mean +- 1 standard deviation. From the property of normal distribution, thus 68% of data are expected to fall between 6 ans 24.