

Multiple Choice

1. In an economic model that uses income to predict monthly expenditures on entertainment, what is the dependent variable?

- a.) income
- b.) monthly expenditures on entertainment
- c.) income elasticity
- d.) demand for entertainment

2. In an economic model that uses income to predict monthly expenditures on entertainment, what is the independent or explanatory variable?

- a.) income
- b.) monthly expenditures on entertainment
- c.) income elasticity
- d.) demand for entertainment

3. Which of the following is NOT an assumption of the Simple Linear Regression Model?

- a.) The value of y , for each value of x , is
$$y = \beta_1 + \beta_2 x + e$$
- b.) The variance of the random error e is
$$\text{var}(e) = \sigma^2$$
- c.) The covariance between any pair of random errors e_i and e_j is zero
- d.) The parameter estimate of β_1 is unbiased.

4. The OLS estimators for β_1 and β_2 are formulas derived by minimizing _____.

- a.) the sum of the error terms or residuals
- b.) the sum of the squared residuals
- c.) the slope of the regression line
- d.) the fit of the regression line to the observed data.

5. Applying the OLS model to our data give us the following regression equation:

$$\hat{y} = 3.41 + 12.89 x.$$

What would the forecast value be when the independent variable is 15.0?

- a.) 196.76
- b.) 16.30
- c.) 244.50

d.) 32.19

6. In the OLS model, what happens to $\text{var}(b_1)$ as the sample size (N) increases?

- a.) it also increases
- b.) it decreases
- c.) it does not change
- d.) cannot be determined without more information

7. If b_1 is an estimator for β_1 such that $E(b_1) = \beta_1$, then it must be the case that

- a.) b_1 is an efficient estimator
- b.) b_1 is an unbiased estimator
- c.) b_1 is a linear estimator
- d.) b_1 is a preferred estimator

8. What mathematical theorem allows for normally distributed least squares estimators when assumptions SR1 – SR5 hold but the error term is NOT normally distributed?

- a.) Central Limit Theorem
- b.) Gauss-Markov Theorem
- c.) Law of Large Numbers
- d.) the Least Squares Principle

9. If we use $\frac{\sum \hat{e}_i^2}{N}$ as an estimator of σ^2 it is _____, but it can be corrected by _____.

- a.) biased, changing the numerator to $\sum e_i^2$
- b.) non-linear, changing the denominator to $N - 2$
- c.) biased, changing the denominator to $N-2$
- d.) non-linear, taking the log of each term.