10 SIMPLE & LINEAR REGRESSION

1. The estimated slope coefficient in a simple linear regression is:
   (A) the predicted value of the dependent variable, given the actual value of the independent variable.
   (B) the change in the independent variable, given a one-unit change in the dependent variable.
   (C) the ratio of the covariance of the regression variables to the variance of the independent variable.

2. Given the relationship: Y = 2.83 + 1.5X
   What is the predicted value of the dependent variable when the value of the independent variable equals 2?
   (A) 2.83.
   (B) –0.55.
   (C) 5.83.

3. When there is a linear relationship between an independent variable and the relative change in the dependent variable, the most appropriate model for a simple regression is:
   (A) the log-log model.
   (B) the log-lin model.
   (C) the lin-log model

4. Consider the following analysis of variance (ANOVA) table:

Source	Sum of squares	Degrees of freedom	Mean sum of squares
Regression	556	1	556
Error	679	50	13.5
Total	1,235	51	

   The R^2 for this regression is closest to
   (A) 0.45.
   (B) 0.55.
   (C) 0.82.

5. The coefficient of determination for a linear regression is best described as the:
   (A) percentage of the variation in the dependent variable explained by the variation of the independent variable.
   (B) percentage of the variation in the independent variable explained by the variation of the dependent variable.
   (C) covariance of the independent and dependent variables.

6. A simple linear regression is said to exhibit heteroskedasticity if its residual term:
   (A) does not have a constant variance.
   (B) is nonnormally distributed.
   (C) is not independently distributed

7. To determine a confidence interval around the predicted value from a simple linear regression, the appropriate degrees of freedom are:
   (A) n – 1.
   (B) n.
   (C) n – 2.

8. Which of the following is least likely an assumption of linear regression?
   (A) The variance of the error terms each period remains the same.
   (B) The error terms from a regression are positively correlated.
   (C) Values of the independent variable are not correlated with the error term.

9. A simple linear regression is a model of the relationship between:
   (A) one dependent variable and one or more independent variables.
   (B) one dependent variable and one independent variable.
   (C) one or more dependent variables and one or more independent variables.

10. Consider the following analysis of variance (ANOVA) table

Source	Sum of squares	Degrees of freedom	Mean sum of squares
Regression	550	1	550.00
Error	750	38	19.737
Total	1,300	39	

The F-statistic for the test of the fit of the model is closest to:
   (A) 0.42.
   (B) 0.97.
   (C) 27.87.

11. To account for logarithmic variables, functional forms of simple linear regressions are available if:
    (A) the independent variable is logarithmic, but not if the dependent variable is logarithmic.
    (B) either the dependent or independent variable is logarithmic, but not both.
    (C) either or both of the dependent and independent variables are logarithmic.

12. A simple linear regression is performed to quantify the relationship between the return on the common stocks of medium-sized companies (mid-caps) and the return on the S&P 500 index, using the monthly return on mid-cap stocks as the dependent variable and the monthly return on the S&P 500 as the independent variable. The results of the regression are shown below:

	Coefficient	Standard Error of Coefficient	t-Value
Intercept	1.71	2.950	0.58
S&P 500	1.52	0.130	11.69
Coefficient of determination = 0.599			

The strength of the relationship, as measured by the correlation coefficient, between the on mid-cap stocks and the return on the S&P 500 for the period under study was
    (A) 0.130.
    (B) 0.774.
    (C) 0.599.

13. In a simple regression model, the least squares criterion is to minimize the sum of squared differences between:
    (A) the intercept term and the residual term.
    (B) the predicted and actual values of the dependent variable.
    (C) the estimated and actual slope coefficient.