7 INTRODUCTION TO LINEAR REGRESSION

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

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

3. 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) 5.83.
   (B) -0.55.
   (C) 2.83.

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) 0.82.
   (B) 0.45.
   (C) 0.55

5. Use the following t-table for this question:

Probability in Right Tail			
d.f.	5.0%	2.5%	1.0%
196	1.653	1.972	2.346
197	1.653	1.972	2.345

198	1.653	1.972	2.345
199	1.653	1.972	2.345
200	1.653	1.972	2.345
201	1.652	1.972	2.345
202	1.652	1.972	2.345

A sample of 200 monthly observations is used for a simple linear regression of returns versus leverage. The resulting equation is:

returns = 0.04 + 0.894(Leverage) + E

If the standard error of the estimated slope variable is 0.06, a test of the hypothesis that the slope coefficient is greater than or equal to 1.0 with a significance of 5% should:

(A) be rejected because the test statistic of -1.77 is less than the critical value.

(B) be rejected the test statistic of -1.77 is greater than the critical value.

(C) not be rejected because the test statistic of -1.58 is not less than the critical value.

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

Source	Sum of squares	Degrees of freedom	Mean sum of squares
Regression	550	1	550.000
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) 27.87.

(C) 0.97.

7. 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 return on mid-cap stocks and the return on the S&P 500 f or the period under study was:

(A) 0.774.

(B) 0.130.

(C) 0.599.