

1. *Econometrics is the branch of economics that ____.*

- a. *studies the behavior of individual economic agents in making economic decisions*
- b. *develops and uses statistical methods for estimating economic relationships*
- c. *deals with the performance, structure, behavior, and decision-making of an economy as a whole*
- d. *applies mathematical methods to represent economic theories and solve economic problems*

ANSWER: b

RATIONALE: *FEEDBACK:* Econometrics is the branch of economics that develops and uses statistical methods for estimating economic relationships.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: What is Econometrics?

KEYWORDS: Bloom's: Knowledge

2. Nonexperimental data is called ____.

- a. cross-sectional data
- b. observational data
- c. time series data
- d. panel data

ANSWER: b

RATIONALE: *FEEDBACK:* Nonexperimental data is called observational data.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: What is Econometrics?

KEYWORDS: Bloom's: Knowledge

3. Which of the following is true of experimental data?

- a. Experimental data are collected in laboratory environments in the natural sciences.
- b. Experimental data cannot be collected in a controlled environment.
- c. Experimental data is sometimes called observational data.
- d. Experimental data is sometimes called retrospective data.

ANSWER: a

RATIONALE: *FEEDBACK:* Experimental data are collected in laboratory environments in the natural sciences.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: What is Econometrics?

KEYWORDS: Bloom's: Knowledge

4. An empirical analysis relies on ____ to test a theory.

- a. common sense
- b. ethical considerations
- c. data

d. customs and conventions

ANSWER: c

RATIONALE: FEEDBACK: An empirical analysis relies on data to test a theory.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Steps in Empirical Economic Analysis

KEYWORDS: Bloom's: Knowledge

5. The term ' u ' in an econometric model is usually referred to as the _____.

- a. error term
- b. parameter
- c. hypothesis
- d. dependent variable

ANSWER: a

RATIONALE: FEEDBACK: The term u in an econometric model is called the error term or disturbance term.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Steps in Empirical Economic Analysis

KEYWORDS: Bloom's: Knowledge

6. The constants of econometric models are referred to as _____.

- a. parameters
- b. statistics
- c. error terms
- d. hypotheses

ANSWER: a

RATIONALE: FEEDBACK: The constants of econometric models are referred to as parameters .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Steps in Empirical Economic Analysis

KEYWORDS: Bloom's: Knowledge

7. The parameters of an econometric model _____.

- a. include all unobserved factors affecting the variable being studied
- b. describe the strength of the relationship between the variable under study and the factors affecting it
- c. refer to the explanatory variables included in the model
- d. refer to the predictions that can be made using the model

ANSWER: a

RATIONALE: FEEDBACK: The parameters of an econometric model describe the direction and strength of the relationship between the variable under study and the factors affecting it.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Steps in Empirical Economic Analysis
KEYWORDS: Bloom's: Knowledge

8. Which of the following is the first step in empirical economic analysis?

- a. Collection of data
- b. Statement of hypotheses
- c. Specification of an econometric model
- d. Testing of hypotheses

ANSWER: c

RATIONALE: **FEEDBACK:** The first step in empirical economic analysis is the specification of the econometric model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Steps in Empirical Economic Analysis

KEYWORDS: Bloom's: Knowledge

9. A data set that consists of a sample of individuals, households, firms, cities, states, countries, or a variety of other units, taken at a given point in time, is called a(n) _____.

- a. cross-sectional data set
- b. longitudinal data set
- c. time series data set
- d. experimental data set

ANSWER: a

RATIONALE: **FEEDBACK:** A data set that consists of a sample of individuals, households, firms, cities, states, countries, or a variety of other units, taken at a given point in time, is called a cross-sectional data set.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Structure of Economic Data

KEYWORDS: Bloom's: Knowledge

10. Data on the income of law graduates collected at different times during the same year is _____.

- a. panel data
- b. experimental data
- c. time series data
- d. cross-sectional data

ANSWER: d

RATIONALE: **FEEDBACK:** A data set that consists of a sample of individuals, households, firms, cities, states, countries, or a variety of other units, taken at a given point in time, is called a cross-sectional data set. Therefore, data on the income of law graduates on a particular year are examples of cross-sectional data.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: The Structure of Economic Data

KEYWORDS: Bloom's: Application

11. A data set that consists of observations on a variable or several variables over time is called a _____ data set.

- a. binary
- b. cross-sectional
- c. time series
- d. experimental

ANSWER: c

RATIONALE: FEEDBACK: A time-series data set consists of observations on a variable or several variables over time.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Structure of Economic Data

KEYWORDS: Bloom's: Knowledge

12. Which of the following is true of time series data?

- a. The time series data is easier to analyze than cross-sectional data.
- b. The time series data are independent across time.
- c. The chronological ordering of observations in a time series conveys potentially important information.
- d. A time series data set consists of observations on a variable or several variables at a given time.

ANSWER: c

RATIONALE: FEEDBACK: The chronological ordering of observations in a time series conveys potentially important information.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Structure of Economic Data

KEYWORDS: Bloom's: Knowledge

13. Which of the following is an example of time series data?

- a. Data on the unemployment rates in different parts of a country during a year.
- b. Data on the consumption of wheat by 200 households during a year.
- c. Data on the gross domestic product of a country over a period of 10 years.
- d. Data on the number of vacancies in various departments of an organization on a particular month.

ANSWER: c

RATIONALE: FEEDBACK: A time-series data set consists of observations on a variable or several variables over time. Therefore, data on the gross domestic product of a country over a period of 10 years is an example of time series data.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: The Structure of Economic Data

KEYWORDS: Bloom's: Application

14. Which of the following refers to panel data?

- a. Data on the unemployment rate in a country over a 5-year period
- b. Data on the birth rate, death rate and population growth rate in developing countries over a 10-year period.
- c. Data on the income of 5 members of a family on a particular year.
- d. Data on the price of a company's share during a year.

ANSWER: b

RATIONALE: FEEDBACK: A panel data set consists of a time series for each cross-sectional member in the data set. Therefore, data on the birth rate, death rate and infant mortality rate in developing countries over a 10-year period refers to panel data.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: The Structure of Economic Data

KEYWORDS: Bloom's: Application

15. Which of the following is a difference between panel and pooled cross-sectional data?

- a. A panel data set consists of data on different cross-sectional units over a given period of time while a pooled data set consists of data on the same cross-sectional units over a given period of time.
- b. A panel data set consists of data on the same cross-sectional units over a given period of time while a pooled data set consists of data on different cross-sectional units over a given period of time
- c. A panel data consists of data on a single variable measured at a given point in time while a pooled data set consists of data on the same cross-sectional units over a given period of time.
- d. A panel data set consists of data on a single variable measured at a given point in time while a pooled data set consists of data on more than one variable at a given point in time.

ANSWER: b

RATIONALE: FEEDBACK: A panel data set consists of data on the same cross-sectional units over a given period of time while a pooled data set consists of data on the same cross-sectional units over a given period of time.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Structure of Economic Data

KEYWORDS: Bloom's: Knowledge

16. _____ has a causal effect on _____.

- a. Income; unemployment
- b. Height; health
- c. Income; consumption
- d. Age; wage

ANSWER: c

RATIONALE: FEEDBACK: Income has a causal effect on consumption because an increase in income leads to an increase in consumption.

POINTS: 1

DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic
TOPICS: Causality and the Notion of Ceteris Paribus in Econometric Analysis
KEYWORDS: Bloom's: Application

17. Which of the following is true?

- a. A variable has a causal effect on another variable if both variables increase or decrease simultaneously.
- b. The notion of 'ceteris paribus' plays an important role in causal analysis.
- c. Difficulty in inferring causality disappears when studying data at fairly high levels of aggregation.
- d. The problem of inferring causality arises if experimental data is used for analysis.

ANSWER: b
RATIONALE: *FEEDBACK:* The notion of 'ceteris paribus' plays an important role in causal analysis.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Causality and the Notion of Ceteris Paribus in Econometric Analysis
KEYWORDS: Bloom's: Knowledge

18. Which of the following terms measures the association between two variables?

- a. Casual effect
- b. Independence
- c. Average
- d. Correlation

ANSWER: d
RATIONALE: *FEEDBACK:* The association between two variables are measured by correlation.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Causality and the Notion of Ceteris Paribus in Econometric Analysis
KEYWORDS: Bloom's: Comprehension

19. Experimental data are sometimes called retrospective data.

- a. True
- b. False

ANSWER: False
RATIONALE: *FEEDBACK:* Nonexperimental data are sometimes called retrospective data.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: What is Econometrics?
KEYWORDS: Bloom's: Knowledge

20. Experimental data are easy to obtain in the social sciences.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: Experimental data are more difficult to obtain in the social sciences.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: What is Econometrics?

KEYWORDS: Bloom's: Knowledge

21. An economic model consists of mathematical equations that describe various relationships between economic variables.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: An economic model consists of mathematical equations that describe various relationships between economic variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Steps in Empirical Economic Analysis

KEYWORDS: Bloom's: Knowledge

22. Random sampling complicates the analysis of cross-sectional data.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: *An important feature of cross-sectional data is that we can often assume that they have been obtained by random sampling from the underlying population and it simplifies the analysis of cross-sectional data.*

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Structure of Economic Data

KEYWORDS: Bloom's: Knowledge

23. A cross-sectional data set consists of observations on a variable or several variables over time.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: A time series data set consists of observations on a variable or several variables over time.

POINTS: 1

DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Structure of Economic Data
KEYWORDS: Bloom's: Knowledge

24. A time series data is also called a longitudinal data set.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: A panel data is also called a longitudinal data set.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Structure of Economic Data
KEYWORDS: Bloom's: Knowledge

25. *The notion of ceteris paribus means "other factors being equal."*

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: The notion of ceteris paribus means "other factors being equal."
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Causality and the Notion of Ceteris Paribus in Econometric Analysis
KEYWORDS: Bloom's: Knowledge

1. A dependent variable is also known as a(n) _____.

- a. explanatory variable
- b. control variable
- c. predictor variable
- d. response variable

ANSWER: d

RATIONALE: FEEDBACK: A dependent variable is known as a response variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Definition of the Simple Regression Model

KEYWORDS: Bloom's: Knowledge

2. If a change in variable x causes a change in variable y , variable x is called the _____.

- a. dependent variable
- b. explained variable
- c. explanatory variable
- d. response variable

ANSWER: c

RATIONALE: FEEDBACK: If a change in variable x causes a change in variable y , variable x is called the independent variable or the explanatory variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Definition of the Simple Regression Model

KEYWORDS: Bloom's: Comprehension

3. In the equation $y = \beta_0 + \beta_1 x + u$, β_0 is the _____.

- a. dependent variable
- b. independent variable
- c. slope parameter
- d. intercept parameter

ANSWER: d

RATIONALE: FEEDBACK: In the equation $y = \beta_0 + \beta_1 x + u$, β_0 is the intercept parameter.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Definition of the Simple Regression Model

KEYWORDS: Bloom's: Knowledge

4. In the equation $y = \beta_0 + \beta_1 x + u$, what is the estimated value of β_0 ?

- a. $\bar{y} - \hat{\beta}_1 \bar{x}$
- b. $\bar{y} + \beta_1 \bar{x}$

$$c. \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^n (x_i)^2}$$

$$d. \sum_{i=1}^n xy$$

ANSWER:

a

RATIONALE:

FEEDBACK: The estimated value of β_0 is $\bar{y} - \hat{\beta}_1 \bar{x}$.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Deriving the Ordinary Least Squares Estimates

KEYWORDS:

Bloom's: Knowledge

5. In the equation $c = \beta_0 + \beta_1 i + u$, c denotes consumption and i denotes income. What is the residual for the 5th observation if $c_5 = \$500$ and $\hat{c}_5 = \$475$?

- a. \$975
- b. \$300
- c. \$25
- d. \$50

ANSWER:

c

RATIONALE:

FEEDBACK: The formula for calculating the residual for the i^{th} observation is $\hat{u}_i = y_i - \hat{y}_i$. In this case, the residual is $\hat{u}_5 = c_5 - \hat{c}_5 = \$500 - \$475 = \25 .

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Deriving the Ordinary Least Squares Estimates

KEYWORDS:

Bloom's: Application

6. What does the equation $\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x$ denote if the regression equation is $y = \beta_0 + \beta_1 x_1 + u$?

- a. The explained sum of squares
- b. The total sum of squares
- c. The sample regression function
- d. The population regression function

ANSWER:

c

RATIONALE:

FEEDBACK: The equation $\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x$ denotes the sample regression function of the given regression model.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Deriving the Ordinary Least Squares Estimates

KEYWORDS: Bloom's: Knowledge

7. If x_i and y_i are positively correlated in the sample then the estimated slope is _____.

- a. less than zero
- b. greater than zero
- c. equal to zero
- d. equal to one

ANSWER: b

RATIONALE: **FEEDBACK:** If x_i and y_i are positively correlated in the sample then the estimated slope is greater than zero.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Deriving the Ordinary Least Squares Estimates

KEYWORDS: Bloom's: Knowledge

8. The sample correlation between x_i and y_i is denoted by _____.

- a. $\hat{\beta}_1$
- b. $\hat{\sigma}_x$
- c. $\hat{\sigma}_y$
- d. $\hat{\rho}_{xy}$

ANSWER: d

RATIONALE: **FEEDBACK:** The sample correlation between x_i and y_i is denoted by $\hat{\rho}_{xy}$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Deriving the Ordinary Least Squares Estimates

KEYWORDS: Bloom's: Knowledge

9. Consider the following regression model: $y = \alpha_0 + \beta_1 x_1 + u$. Which of the following is a property of Ordinary Least Square (OLS) estimates of this model and their associated statistics?

- a. The sum, and therefore the sample average of the OLS residuals, is positive.
- b. The sum of the OLS residuals is negative.
- c. The sample covariance between the regressors and the OLS residuals is positive.
- d. The point (\bar{x}, \bar{y}) always lies on the OLS regression line.

ANSWER: d

RATIONALE: **FEEDBACK:** An important property of the OLS estimates is that the point (\bar{x}, \bar{y}) always lies on the OLS regression line. In other words, if $\mathbf{x} = \bar{\mathbf{x}}$, the predicted value of y is \bar{y} .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Properties of OLS on Any Sample of Data

KEYWORDS: Bloom's: Knowledge

10. The explained sum of squares for the regression function, $y_i = \beta_0 + \beta_1 x_1 + u_1$, is defined as _____.

a. $\sum_{i=1}^n (y_i - \bar{y})^2$

b. $\sum_{i=1}^n (y_i - \hat{y})^2$

c. $\sum_{i=1}^n \hat{u}_i$

d. $\sum_{i=1}^n (u_i)^2$

ANSWER:

b

RATIONALE:

FEEDBACK: The explained sum of squares is defined as $\sum_{i=1}^n (y_i - \hat{y})^2$.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Properties of OLS on Any Sample of Data

KEYWORDS: Bloom's: Knowledge

11. If the total sum of squares (SST) in a regression equation is 81, and the residual sum of squares (SSR) is 25, what is the explained sum of squares (SSE)?

a. 64

b. 56

c. 32

d. 18

ANSWER:

b

RATIONALE:

FEEDBACK: Total sum of squares (SST) is given by the sum of explained sum of squares (SSE) and residual sum of squares (SSR). Therefore, in this case, $SSE = 81 - 25 = 56$.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: Properties of OLS on Any Sample of Data

KEYWORDS: Bloom's: Application

12. If the residual sum of squares (SSR) in a regression analysis is 66 and the total sum of squares (SST) is equal to 90, what is the value of the coefficient of determination?

a. 0.73

b. 0.55

c. 0.27

d. 1.2

ANSWER:

c

RATIONALE:

FEEDBACK: The formula for calculating the coefficient of determination is $R^2 = 1 - \frac{SSR}{SST}$.

In this case, $R^2 = 1 - \frac{66}{90} = 0.27$.

POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic
TOPICS: Properties of OLS on Any Sample of Data
KEYWORDS: Bloom's: Application

13. Which of the following is a nonlinear regression model?

- a. $y = \alpha_0 + \beta_1 x^{1/2} + u$
- b. $\log y = \alpha_0 + \beta_1 \log x + u$
- c. $y = 1 / (\alpha_0 + \beta_1 x) + u$
- d. $y = \alpha_0 + \beta_1 x + u$

ANSWER: c
RATIONALE: **FEEDBACK:** A regression model is nonlinear if the equation is nonlinear in the parameters. In this case, $y = 1 / (\alpha_0 + \beta_1 x) + u$ is nonlinear as it is nonlinear in its parameters.

POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Properties of OLS on Any Sample of Data
KEYWORDS: Bloom's: Comprehension

14. In a regression equation, changing the units of measurement of only the independent variable does not affect the _____.

- a. dependent variable
- b. slope
- c. intercept
- d. error term

ANSWER: c
RATIONALE: **FEEDBACK:** In a regression equation, changing the units of measurement of only the independent variable does not affect the intercept.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Units of Measurement and Functional Form
KEYWORDS: Bloom's: Knowledge

15. Which of the following is assumed for establishing the unbiasedness of Ordinary Least Square (OLS) estimates?

- a. The error term has an expected value of 1 given any value of the explanatory variable.
- b. The regression equation is linear in the explained and explanatory variables.
- c. The sample outcomes on the explanatory variable are all the same value.
- d. The error term has the same variance given any value of the explanatory variable.

ANSWER: d
RATIONALE: **FEEDBACK:** The error u has the same variance given any value of the explanatory variable.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Expected Values and Variances of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

16. The error term in a regression equation is said to exhibit homoskedasticity if _____.
a. it has zero conditional mean
b. it has the same variance for all values of the explanatory variable
c. it has the same value for all values of the explanatory variable
d. if the error term has a value of one given any value of the explanatory variable

ANSWER: b

RATIONALE: FEEDBACK: The error term in a regression equation is said to exhibit homoskedasticity if it has the same variance for all values of the explanatory variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Expected Values and Variances of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

17. In the regression of y on x , the error term exhibits heteroskedasticity if _____.
a. it has a constant variance
b. $\text{Var}(y|x)$ is a function of x
c. x is a function of y
d. y is a function of x

ANSWER: b

RATIONALE: FEEDBACK: Heteroskedasticity is present whenever $\text{Var}(y|x)$ is a function of x because $\text{Var}(u|x) = \text{Var}(y|x)$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Expected Values and Variances of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

18. What is the estimated value of the slope parameter when the regression equation, $y = \alpha_0 + \beta_1 x_1 + u$ passes through the origin?

- a. $\sum_{i=1}^n y_i$
b. $\sum_{i=1}^n (y_i - \bar{y})$
c. $\frac{\sum_{i=1}^n x_i y_i}{\sum_{i=1}^n x_i^2}$
d. $\sum_{i=1}^n (y_i - \bar{y})^2$

ANSWER: c

RATIONALE:

FEEDBACK: The estimated value of the slope parameter when the regression equation passes

through the origin is $\frac{\sum_{i=1}^n x_i y_i}{\sum_{i=1}^n x_i^2}$.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Regression through the Origin and Regression on a Constant

KEYWORDS:

Bloom's: Knowledge

19. A natural measure of the association between two random variables is the correlation coefficient.

a. True

b. False

ANSWER:

True

RATIONALE:

FEEDBACK: A natural measure of the association between two random variables is the correlation coefficient.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Definition of the Simple Regression Model

KEYWORDS:

Bloom's: Knowledge

20. Simple regression is an analysis of correlation between two variables.

a. True

b. False

ANSWER:

True

RATIONALE:

FEEDBACK: Simple regression is an analysis of correlation between two variables.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Deriving the Ordinary Least Squares Estimates

KEYWORDS:

Bloom's: Knowledge

21. The sample covariance between the regressors and the Ordinary Least Square (OLS) residuals is always positive.

a. True

b. False

ANSWER:

False

RATIONALE:

FEEDBACK: The sample covariance between the regressors and the Ordinary Least Square (OLS) residuals is zero.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Properties of OLS on Any Sample of Data

KEYWORDS:

Bloom's: Knowledge

22. R^2 is the ratio of the explained variation compared to the total variation.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The sample covariance between the regressors and the Ordinary Least Square (OLS) residuals is zero.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Properties of OLS on Any Sample of Data

KEYWORDS: Bloom's: Knowledge

23. There are $n-1$ degrees of freedom in Ordinary Least Square residuals.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: There are $n-2$ degrees of freedom in Ordinary Least Square residuals.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Expected Values and Variances of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

24. The variance of the slope estimator increases as the error variance decreases.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: The variance of the slope estimator increases as the error variance increases.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Expected Values and Variances of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

25. In general, the constant that produces the smallest sum of squared deviations is always the sample average.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: In general, the constant that produces the smallest sum of squared deviations is always the sample average.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Regression through the Origin and Regression on a Constant

KEYWORDS: Bloom's: Knowledge



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1. In the equation, $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$, β_2 is a(n) ____.
- independent variable
 - dependent variable
 - slope parameter
 - intercept parameter

ANSWER:

c

RATIONALE:

FEEDBACK: In the equation, $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$, β_2 is a slope parameter.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Motivation for Multiple Regression

KEYWORDS:

Bloom's: Knowledge

2. Consider the following regression equation: $y = \beta_1 + \beta_2 x_1 + \beta_2 x_2 + u$. What does β_1 imply?
- β_1 measures the ceteris paribus effect of x_1 on x_2 .
 - β_1 measures the ceteris paribus effect of y on x_1 .
 - β_1 measures the ceteris paribus effect of x_1 on y .
 - β_1 measures the ceteris paribus effect of x_1 on u .

ANSWER:

c

RATIONALE:

FEEDBACK: β_1 measures the ceteris paribus effect of x_1 on y .

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Motivation for Multiple Regression

KEYWORDS:

Bloom's: Knowledge

3. In econometrics, the general partialling out result is usually called the ____.
- Gauss-Markov assumption
 - Best linear unbiased estimator
 - Frisch-Waugh theorem
 - Gauss-Markov theorem

ANSWER:

c

RATIONALE:

FEEDBACK: In econometrics, the general partialling out result is usually called the Frisch-Waugh theorem.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Mechanics and Interpretation of Ordinary Least Squares

KEYWORDS:

Bloom's: Knowledge

4. If the explained sum of squares is 35 and the total sum of squares is 49, what is the residual sum of squares?
- 10
 - 12

c. 18

d. 14

ANSWER: d

RATIONALE: FEEDBACK: The residual sum of squares is obtained by subtracting the explained sum of squares from the total sum of squares, or $49 - 35 = 14$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: Mechanics and Interpretation of Ordinary Least Squares

KEYWORDS: Bloom's: Application

5. Which of the following is true of R^2 ?

a. R^2 is also called the standard error of regression.

b. A low R^2 indicates that the Ordinary Least Squares line fits the data well.

c. R^2 usually decreases with an increase in the number of independent variables in a regression.

d. R^2 shows what percentage of the total variation in the dependent variable, Y , is explained by the explanatory variables.

ANSWER: d

RATIONALE: FEEDBACK: R^2 shows what percentage of the total variation in Y is explained by the explanatory variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Mechanics and Interpretation of Ordinary Least Squares

KEYWORDS: Bloom's: Knowledge

6. The value of R^2 always ____.

a. lies below 0

b. lies above 1

c. lies between 0 and 1

d. lies between 1 and 1.5

ANSWER: c

RATIONALE: FEEDBACK: By definition, the value of R^2 always lies between 0 and 1.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Mechanics and Interpretation of Ordinary Least Squares

KEYWORDS: Bloom's: Knowledge

7. If an independent variable in a multiple linear regression model is an exact linear combination of other independent variables, the model suffers from the problem of ____.

a. perfect collinearity

b. homoskedasticity

c. heteroskedasticity

d. omitted variable bias

ANSWER: a

RATIONALE: FEEDBACK: If an independent variable in a multiple linear regression model is an exact linear combination of other independent variables, the model suffers from the problem of perfect collinearity.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Expected Value of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

8. The assumption that there are no exact linear relationships among the independent variables in a multiple linear regression model fails if _____, where n is the sample size and k is the number of parameters.

- a. $n > 2$
- b. $n = k + 1$
- c. $n > k$
- d. $n < k + 1$

ANSWER: d

RATIONALE: FEEDBACK: The assumption of no perfect collinearity among independent variables fails if $n < k + 1$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Expected Value of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

9. Exclusion of a relevant variable from a multiple linear regression model leads to the problem of _____.

- a. misspecification of the model
- b. multicollinearity
- c. perfect collinearity
- d. homoskedasticity

ANSWER: a

RATIONALE: FEEDBACK: Exclusion of a relevant variable from a multiple linear regression model leads to the problem of misspecification of the model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Expected Value of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

10. Suppose the variable x_2 has been omitted from the following regression equation, $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$. $\bar{\beta}_1$ is the estimator obtained when x_2 is omitted from the equation. The bias in $\bar{\beta}_1$ is positive if _____.

- a. $\beta_2 > 0$ and x_1 and x_2 are positively correlated
- b. $\beta_2 < 0$ and x_1 and x_2 are positively correlated
- c. $\beta_2 > 0$ and x_1 and x_2 are negatively correlated

- d. $\beta_2 = 0$ and x_1 and x_2 are negatively correlated

ANSWER: a

RATIONALE: FEEDBACK: When the variable x_2 is omitted from the regression, the bias in $\bar{\beta}_1$ is positive if $\beta_2 > 0$ and x_1 and x_2 are positively correlated.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Expected Value of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

11. Suppose the variable x_2 has been omitted from the following regression equation, $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$. $\bar{\beta}_1$ is the estimator obtained when x_2 is omitted from the equation. The bias in $\bar{\beta}_1$ is negative if ____.

- a. $\beta_2 > 0$ and x_1 and x_2 are positively correlated
- b. $\beta_2 < 0$ and x_1 and x_2 are positively correlated
- c. $\beta_2 = 0$ and x_1 and x_2 are negatively correlated
- d. $\beta_2 = 0$ and x_1 and x_2 are negatively correlated

ANSWER: b

RATIONALE: FEEDBACK: When the variable x_2 is omitted from the regression, the bias in $\bar{\beta}_1$ is negative if $\beta_2 < 0$ and x_1 and x_2 are positively correlated.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Expected Value of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

12. Suppose the variable x_2 has been omitted from the following regression equation, $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$. $\bar{\beta}_1$ is the estimator obtained when x_2 is omitted from the equation. If $E(\bar{\beta}_1) > \beta_1$, $\bar{\beta}_1$ is said to ____.

- a. have an upward bias
- b. have a downward bias
- c. be unbiased
- d. be biased toward zero

ANSWER: a

RATIONALE: FEEDBACK: When the variable x_2 is omitted from the following regression equation, $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u$, $\bar{\beta}_1$ has an upward bias if $E(\bar{\beta}_1) > \beta_1$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Expected Value of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

13. High (but not perfect) correlation between two or more independent variables is called ____.

- a. heteroskedasticity
- b. homoskedasticity
- c. multicollinearity
- d. micronumerosity

ANSWER: c

RATIONALE: FEEDBACK: High, but not perfect, correlation between two or more independent variables is called multicollinearity.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Variance of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

14. The term _____ refers to the problem of small sample size.

- a. micronumerosity
- b. multicollinearity
- c. homoskedasticity
- d. heteroskedasticity

ANSWER: a

RATIONALE: FEEDBACK: The term micronumerosity refers to the problem of small sample size.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Variance of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

15. $\text{Var}(\tilde{\beta}_j) = \frac{\sigma^2}{\text{SST}_j}$ ignores the error variance increase because it treats both regressors as _____.

- a. random
- b. nonrandom
- c. independent
- d. dependent

ANSWER: b

RATIONALE: FEEDBACK: $\text{Var}(\tilde{\beta}_j) = \frac{\sigma^2}{\text{SST}_j}$ ignores the error variance increase because it treats both regressors as nonrandom.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Variance of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

16. Find the degrees of freedom in a regression model that has 10 observations and 7 independent variables.

- a. 17

- b. 2
- c. 3
- d. 4

ANSWER:

b

RATIONALE:

FEEDBACK: The degrees of freedom in a regression model is computed by subtracting the number of parameters from the number of observations in a regression model. Since, the number of parameters is one more than the number of independent variables, the degrees of freedom in this case is $10 - (7 + 1) = 2$.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS:

The Variance of the OLS Estimators

KEYWORDS:

Bloom's: Knowledge

17. The Gauss-Markov theorem will not hold if _____.

- a. the error term has the same variance given any values of the explanatory variables
- b. the error term has an expected value of zero given any values of the independent variables
- c. the independent variables have exact linear relationships among them
- d. the regression model relies on the method of random sampling for collection of data

ANSWER:

c

RATIONALE:

FEEDBACK: The Gauss-Markov theorem will not hold if the independent variables have exact linear relationships among them.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Efficiency of OLS: The Gauss-Markov Theorem

KEYWORDS:

Bloom's: Knowledge

18. Which of the following is true of BLUE?

- a. It is a rule that can be applied to any one value of the data to produce an estimate.
- b. An estimator $\tilde{\beta}_j$ is an unbiased estimator of β_j if $\text{Var}(\tilde{\beta}_j) = \beta_j$ for any $\beta_0, \beta_1, \dots, \beta_k$.
- c. An estimator is linear if and only if it can be expressed as a linear function of the data on the dependent variable.
- d. It is the best linear uniform estimator.

ANSWER:

c

RATIONALE:

FEEDBACK: An estimator is linear if, and only if, it can be expressed as a linear function of the data on the dependent variable.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Efficiency of OLS: The Gauss-Markov Theorem

KEYWORDS:

Bloom's: Knowledge

19. The term "linear" in a multiple linear regression model means that the equation is linear in parameters.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: The term “linear” in a multiple linear regression model means that the equation is linear in parameters.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Motivation for Multiple Regression
KEYWORDS: Bloom’s: Knowledge

20. The key assumption for the general multiple regression model is that all factors in the unobserved error term be correlated with the explanatory variables.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: The key assumption of the general multiple regression model is that all factors in the unobserved error term be uncorrelated with the explanatory variables.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Motivation for Multiple Regression
KEYWORDS: Bloom’s: Knowledge

21. The coefficient of determination (R^2) decreases when an independent variable is added to a multiple regression model.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: The coefficient of determination (R^2) never decreases when an independent variable is added to a multiple regression model.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Mechanics and Interpretation of Ordinary Least Squares
KEYWORDS: Bloom’s: Knowledge

22. If two regressions use different sets of observations, then we can tell how the R -squareds will compare, even if one regression uses a subset of regressors.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: If two regressions use different sets of observations, then we cannot tell how the R -squareds will compare, even if one regression uses a subset of regressors.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Mechanics and Interpretation of Ordinary Least Squares

KEYWORDS: Bloom's: Knowledge

23. An explanatory variable is said to be exogenous if it is correlated with the error term.

- a. True
- b. False

ANSWER: False

RATIONALE: *FEEDBACK:* An explanatory variable is said to be endogenous if it is correlated with the error term.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Expected Value of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

24. A larger error variance makes it difficult to estimate the partial effect of any of the independent variables on the dependent variable.

- a. True
- b. False

ANSWER: True

RATIONALE: *FEEDBACK:* A larger error variance makes it difficult to estimate the partial effect of any of the independent variables on the dependent variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Variance of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

25. When one randomly samples from a population, the total sample variation in x_j decreases without bound as the sample size increases.

- a. True
- b. False

ANSWER: False

RATIONALE: *FEEDBACK:* When one randomly samples from a population, the total sample variation in x_j increases without bound as the sample size increases.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Variance of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

1. The normality assumption implies that:

- the population error u is dependent on the explanatory variables and is normally distributed with mean equal to one and variance σ^2 .
- the population error u is independent of the explanatory variables and is normally distributed with mean equal to one and variance σ .
- the population error u is dependent on the explanatory variables and is normally distributed with mean zero and variance σ .
- the population error u is independent of the explanatory variables and is normally distributed with mean zero and variance σ^2 .

ANSWER: d

RATIONALE: FEEDBACK: The normality assumption implies that the population error ' u ' is independent of the explanatory variables and is normally distributed with mean zero and variance σ^2 .

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Sampling Distributions of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

2. Which of the following statements is true?

- Taking a log of a nonnormal distribution yields a distribution that is closer to normal.
- The mean of a nonnormal distribution is 0 and the variance is σ^2 .
- The CLT assumes that the dependent variable is unaffected by unobserved factors.
- OLS estimators have the highest variance among unbiased estimators.

ANSWER: a

RATIONALE: FEEDBACK: Transformations such as logs of nonnormal distributions, yields distributions which are closer to normal.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Sampling Distribution of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

3. A normal variable is standardized by:

- subtracting off its mean from it and multiplying by its standard deviation.
- adding its mean to it and multiplying by its standard deviation.
- subtracting off its mean from it and dividing by its standard deviation.
- adding its mean to it and dividing by its standard deviation.

ANSWER: c

RATIONALE: FEEDBACK: A normal variable is standardized by subtracting off its mean from it and dividing by its standard deviation.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Sampling Distribution of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

4. Which of the following is a statistic that can be used to test hypotheses about a single population parameter?

- a. F statistic
- b. t statistic
- c. χ^2 statistic
- d. Durbin Watson statistic

ANSWER: b

RATIONALE: FEEDBACK: The t statistic can be used to test hypotheses about a single population parameter.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Hypotheses about a Single Population Parameter: The t Test

KEYWORDS: Bloom's: Knowledge

5. Consider the equation, $y = \alpha + \beta_1 x_1 + \beta_2 x_2 + u$. A null hypothesis, $H_0: \beta_2 = 0$ states that:

- a. x_2 has no effect on the expected value of β_2 .
- b. x_2 has no effect on the expected value of y .
- c. β_2 has no effect on the expected value of y .
- d. y has no effect on the expected value of x_2 .

ANSWER: b

RATIONALE: FEEDBACK: In such an equation, a null hypothesis, $H_0: \beta_2 = 0$ states that x_2 has no effect on the expected value of y . This is because β_2 is the coefficient associated with x_2 .

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Hypotheses about a Single Population Parameter: The t Test

KEYWORDS: Bloom's: Comprehension

6. The significance level of a test is:

- a. the probability of rejecting the null hypothesis when it is false.
- b. one minus the probability of rejecting the null hypothesis when it is false.
- c. the probability of rejecting the null hypothesis when it is true.
- d. one minus the probability of rejecting the null hypothesis when it is true.

ANSWER: c

RATIONALE: FEEDBACK: The significance level of a test refers to the probability of rejecting the null hypothesis when it is in fact true.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Hypotheses about a Single Population Parameter: The t Test

KEYWORDS: Bloom's: Knowledge

7. The general t statistic can be written as:

- a. $t = \frac{\text{Hypothesized value}}{\text{Standard error}}$
- b. $t = \text{estimate} - \text{hypothesized value}$
- c. $t = \frac{\text{estimate} - \text{hypothesized value}}{\text{variance}}$
- d. $t = \frac{\text{estimate} - \text{hypothesized value}}{\text{standard error}}$

ANSWER:

d

RATIONALE:

FEEDBACK: The general t statistic can be written as $t =$

$$\frac{\text{estimate} - \text{hypothesized value}}{\text{standard error}}.$$

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Hypotheses about a Single Population Parameter: The t Test

KEYWORDS:

Bloom's: Knowledge

8. Which of the following is true of confidence intervals?

- a. Two quantities $\hat{\beta}_j$ and c are required to construct the confidence intervals.
- b. To obtain the value c in the confidence interval, only the degrees of freedom need to be known.
- c. Confidence intervals are also called interval estimates.
- d. A constructed confidence intervals will always contain the population parameter β_j .

ANSWER:

c

RATIONALE:

FEEDBACK: Confidence intervals are also called interval estimates.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Confidence Intervals

KEYWORDS:

Bloom's: Knowledge

9. Which of the following statements is true of confidence intervals?

- a. Confidence intervals in a CLM are also referred to as point estimates.
- b. Confidence intervals in a CLM provide a range of likely values for the population parameter.
- c. Confidence intervals in a CLM do not depend on the degrees of freedom of a distribution.
- d. Confidence intervals in a CLM can be truly estimated when heteroskedasticity is present.

ANSWER:

b

RATIONALE:

FEEDBACK: Confidence intervals provide a range of likely values for the population parameter and are not point estimates. Estimation of confidence intervals depends on the degrees of freedom of the distribution and cannot be truly estimated when heteroskedasticity is present.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Confidence Intervals

KEYWORDS: Bloom's: Knowledge

10. Which of the following statements is true?

- a. When the standard error of an estimate increases, the confidence interval for the estimate narrows down.
- b. Standard error of an estimate does not affect the confidence interval for the estimate.
- c. The lower bound of the confidence interval for a regression coefficient, say $\hat{\alpha}_j$, is given by $\hat{\beta}_j - [\text{standard error} \times (\hat{\beta}_j)]$.
- d. The upper bound of the confidence interval for a regression coefficient, say $\hat{\alpha}_j$, is given by $\hat{\beta}_j + [\text{Critical value} \times \text{standard error} (\hat{\beta}_j)]$.

ANSWER: d

RATIONALE: FEEDBACK: The upper bound of the confidence interval for a regression coefficient, say $\hat{\alpha}_j$, is given by $\hat{\beta}_j + [\text{Critical value} \times \text{standard error} (\hat{\beta}_j)]$.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Confidence Intervals

KEYWORDS: Bloom's: Knowledge

11. Which of the following is true of standard error?

- a. It can take negative values.
- b. It is an estimate of the standard deviation.
- c. It is the square root of the variance.
- d. It complicates the computation of confidence intervals.

ANSWER: b

RATIONALE: FEEDBACK: The standard error is an estimate of the standard deviation.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Hypotheses about a Single Linear Combination of the Parameters

KEYWORDS: Bloom's: Knowledge

12. Which of the following tools is used to test multiple linear restrictions?

- a. t test
- b. z test
- c. F test
- d. Unit root test

ANSWER: c

RATIONALE: FEEDBACK: The F test is used to test multiple linear restrictions.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

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TOPICS: Testing Multiple Linear Restrictions: The F test

KEYWORDS: Bloom's: Knowledge

13. Which of the following statements is true of hypothesis testing?

- a. The t test can be used to test multiple linear restrictions.
- b. A test of single restriction is also referred to as a joint hypotheses test.
- c. A restricted model will always have fewer parameters than its unrestricted model.
- d. OLS estimates maximize the sum of squared residuals.

ANSWER: c

RATIONALE: FEEDBACK: A restricted model will always have fewer parameters than its unrestricted model.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Multiple Linear Restrictions: The F test

KEYWORDS: Bloom's: Knowledge

14. Which of the following correctly defines F statistic if SSR_r represents sum of squared residuals from the restricted model of hypothesis testing, SSR_{ur} represents sum of squared residuals of the unrestricted model, and q is the number of restrictions placed?

- a.
$$F = \frac{(SSR_{ur} - SSR_r)/q}{SSR_{ur}/(n - k - 1)}$$
- b.
$$F = \frac{(SSR_r - SSR_{ur})/q}{SSR_{ur}/(n - k - 1)}$$
- c.
$$F = \frac{(SSR_{ur} - SSR_r)/q}{SSR_r/(n - k - 1)}$$
- d.
$$F = \frac{(SSR_{ur} - SSR_r)/(n - k - 1)}{SSR_{ur}/q}$$

ANSWER: b

RATIONALE: FEEDBACK: The F statistic is given by, $F = \frac{(SSR_r - SSR_{ur})/q}{SSR_{ur}/(n - k - 1)}$.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Multiple Linear Restrictions: The F test

KEYWORDS: Bloom's: Knowledge

15. Which of the following statements is true?

- a. If the calculated value of F statistic is higher than the critical value, we reject the alternative hypothesis in favor of the null hypothesis.
- b. The F statistic is always nonnegative as SSR_r is never smaller than SSR_{ur} .
- c. Degrees of freedom of a restricted model is always less than the degrees of freedom of an unrestricted model.

d. The F statistic is more flexible than the t statistic to test a hypothesis with a single restriction.

ANSWER: b

RATIONALE: FEEDBACK: The F statistic is always nonnegative as SSR_r is never smaller than SSR_{ur} .

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Multiple Linear Restrictions: The F test

KEYWORDS: Bloom's: Comprehension

16. If $R^2_{ur} = 0.6873$, $R^2_r = 0.5377$, number of restrictions = 3, and $n - k - 1 = 229$, F statistic equals:

- a. 21.2
- b. 28.6
- c. 36.5
- d. 42.1

ANSWER: c

RATIONALE: FEEDBACK: The F statistic can be calculated as $F = [(R^2_{ur} - R^2_r)/q] / [(1 - R^2_{ur})/(n - k - 1)]$. Here, q represents the number of restrictions. In this case it is equal to $[(0.6873 - 0.5377)/3] / [(1 - 0.6873)/229] = [0.04986/0.001365] = 36.5$.

POINTS: 1

DIFFICULTY: Challenging

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: Testing Multiple Linear Restrictions: The F test

KEYWORDS: Bloom's: Application

17. The population parameter in the null hypothesis _____.

- a. is always greater than zero
- b. is always equal to zero
- c. is always less than zero
- d. is not always equal to zero

ANSWER: d

RATIONALE: FEEDBACK: The population parameter in the null hypothesis is not always equal to zero.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Reporting Regression Results

KEYWORDS: Bloom's: Knowledge

18. Which of the following correctly identifies a reason why some authors prefer to report the standard errors rather than the t statistic?

- a. Having standard errors makes it easier to compute confidence intervals.
- b. Standard errors are always positive.
- c. The F statistic can be reported just by looking at the standard errors.
- d. Standard errors can be used directly to test multiple linear regressions.

ANSWER: a

RATIONALE: FEEDBACK: One of the advantages of reporting standard errors over t statistics is that confidence intervals can be easily calculated using standard errors.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Reporting Regression Results

KEYWORDS: Bloom's: Comprehension

19. Whenever the dependent variable takes on just a few values it is close to a normal distribution.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: Whenever the dependent variable takes on just a few values it cannot have anything close to a normal distribution. A normal distribution requires the dependent variable to take up a large range of values.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Sampling Distribution of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

20. The ordinary least square estimators have the smallest variance among all the unbiased estimators.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The ordinary least square estimators have the smallest variance among all the unbiased estimators.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Sampling Distributions of the OLS Estimators

KEYWORDS: Bloom's: Knowledge

21. If the calculated value of the t statistic is greater than the critical value, the null hypothesis, H_0 is rejected in favor of the alternative hypothesis, H_1 .

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: If the calculated value of the t statistic is greater than the critical value, H_0 is rejected in favor of H_1 .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Hypotheses about a Single Population Parameter: The t Test

KEYWORDS: Bloom's: Knowledge

22. $H_1: \hat{a}_j \neq 0$, where \hat{a}_j is a regression coefficient associated with an explanatory variable, represents a one-sided alternative hypothesis.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: $H_1: \hat{a}_j \neq 0$, where \hat{a}_j is a regression coefficient associated with an explanatory variable, represents a two-sided alternative hypothesis.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Hypotheses about a Single Population Parameter: The t Test

KEYWORDS: Bloom's: Knowledge

23. If $\hat{\beta}_1$ and $\hat{\beta}_2$ are estimated values of regression coefficients associated with two explanatory variables in a regression equation, then the standard error $(\hat{\beta}_1 - \hat{\beta}_2) = \text{standard error } (\hat{\beta}_1) - \text{standard error } (\hat{\beta}_2)$.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: If $\hat{\beta}_1$ and $\hat{\beta}_2$ are estimated values of regression coefficients associated with two explanatory variables in a regression equation, then the standard error $(\hat{\beta}_1 - \hat{\beta}_2) \neq \text{standard error } (\hat{\beta}_1) - \text{standard error } (\hat{\beta}_2)$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Hypotheses about a Single Linear Combinations of the Parameters

KEYWORDS: Bloom's: Comprehension

24. Standard errors must always be positive.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: Standard errors must always be positive since they are estimates of standard deviations.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing Hypotheses about a Single Linear Combinations of the Parameters

KEYWORDS: Bloom's: Knowledge

25. In regression analysis, the standard errors should not always be included along with the estimated coefficients.

- a. True

b. False

ANSWER:

False

RATIONALE:

FEEDBACK: In regression analysis, the standard errors should always be included along with the estimated coefficients.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Reporting Regression Results

KEYWORDS:

Bloom's: Knowledge

1. Which of the following statements is true?

- a. The standard error of a regression, $\hat{\sigma}$, is not an unbiased estimator for σ , the standard deviation of the error, u , in a multiple regression model.
- b. In time series regressions, OLS estimators are always unbiased.
- c. Almost all economists agree that unbiasedness is a minimal requirement for an estimator in regression analysis.
- d. All estimators in a regression model that are consistent are also unbiased.

ANSWER:

a

RATIONALE:

FEEDBACK: The standard error of a regression is not an unbiased estimator for the standard deviation of the error in a multiple regression model.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Consistency

KEYWORDS:

Bloom's: Knowledge

2. If $\hat{\beta}_j$, an unbiased estimator of β_j , is consistent, then the:

- a. distribution of $\hat{\beta}_j$ becomes more and more loosely distributed around β_j as the sample size grows.
- b. distribution of $\hat{\beta}_j$ becomes more and more tightly distributed around β_j as the sample size grows.
- c. distribution of $\hat{\beta}_j$ tends toward a standard normal distribution as the sample size grows.
- d. distribution of $\hat{\beta}_j$ remains unaffected as the sample size grows.

ANSWER:

b

RATIONALE:

FEEDBACK: If $\hat{\beta}_j$, an unbiased estimator of β_j , is consistent, then the distribution of $\hat{\beta}_j$ becomes more and more tightly distributed around β_j as the sample size grows.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Consistency

KEYWORDS:

Bloom's: Knowledge

3. If $\hat{\beta}_j$, an unbiased estimator of β_j , is also a consistent estimator of β_j , then when the sample size tends to infinity:

- a. the distribution of $\hat{\beta}_j$ collapses to a single value of zero.
- b. the distribution of $\hat{\beta}_j$ diverges away from a single value of zero.
- c. the distribution of $\hat{\beta}_j$ collapses to the single point β_j .
- d. the distribution of $\hat{\beta}_j$ diverges away from β_j .

ANSWER:

c

RATIONALE:

FEEDBACK: If $\hat{\beta}_j$, an unbiased estimator of β_j , is also a consistent estimator of β_j , then when the sample size tends to infinity the distribution of $\hat{\beta}_j$ collapses to the single point β_j .

POINTS:

1

DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Consistency
KEYWORDS: Bloom's: Knowledge

4. In a multiple regression model, the OLS estimator is consistent if:
- there is no correlation between the dependent variables and the error term.
 - there is a perfect correlation between the dependent variables and the error term.
 - the sample size is less than the number of parameters in the model.
 - there is no correlation between the independent variables and the error term.

ANSWER: d
RATIONALE: FEEDBACK: In a multiple regression model, the OLS estimator is consistent if there is no correlation between the explanatory variables and the error term.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Consistency
KEYWORDS: Bloom's: Knowledge

5. If the error term is correlated with any of the independent variables, the OLS estimators are:
- biased and consistent.
 - unbiased and inconsistent.
 - biased and inconsistent.
 - unbiased and consistent.

ANSWER: c
RATIONALE: FEEDBACK: If the error term is correlated with any of the independent variables, then the OLS estimators are biased and inconsistent.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Consistency
KEYWORDS: Bloom's: Knowledge

6. If $\delta_1 = \text{Cov}(x_1, x_2) / \text{Var}(x_1)$ where x_1 and x_2 are two independent variables in a regression equation, which of the following statements is true?
- If x_2 has a positive partial effect on the dependent variable, and $\delta_1 > 0$, then the inconsistency in the simple regression slope estimator associated with x_1 is negative.
 - If x_2 has a positive partial effect on the dependent variable, and $\delta_1 > 0$, then the inconsistency in the simple regression slope estimator associated with x_1 is positive.
 - If x_1 has a positive partial effect on the dependent variable, and $\delta_1 > 0$, then the inconsistency in the simple regression slope estimator associated with x_1 is negative.
 - If x_1 has a positive partial effect on the dependent variable, and $\delta_1 > 0$, then the inconsistency in the simple regression slope estimator associated with x_1 is positive.

ANSWER: b
RATIONALE: FEEDBACK: Given that $\delta_1 = \text{Cov}(x_1, x_2) / \text{Var}(x_1)$ where x_1 and x_2 are two independent

variables in a regression equation, if x_2 has a positive partial effect on the dependent variable, and $\hat{\sigma}_1 > 0$, then the inconsistency in the simple regression slope estimator associated with x_1 is positive.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Consistency

KEYWORDS:

Bloom's: Knowledge

7. If the model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + v$ satisfies the first four Gauss-Markov assumptions, then v has:

- a. a zero mean and is correlated with only x_1 .
- b. a zero mean and is correlated with x_1 and x_2 .
- c. a zero mean and is correlated with only x_2 .
- d. a zero mean and is uncorrelated with x_1 and x_2 .

ANSWER:

d

RATIONALE:

FEEDBACK: If the model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + v$ satisfies the first four Gauss-Markov assumptions, then v has a zero mean and is uncorrelated with x_1 and x_2 .

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Consistency

KEYWORDS:

Bloom's: Knowledge

8. If OLS estimators satisfy asymptotic normality, it implies that:

- a. they are approximately normally distributed in large enough sample sizes.
- b. they are approximately normally distributed in samples with less than 10 observations.
- c. they have a constant mean equal to zero and variance equal to σ^2 .
- d. they have a constant mean equal to one and variance equal to σ .

ANSWER:

a

RATIONALE:

Feedback: If OLS estimators satisfy asymptotic normality, it implies that they are approximately normally distributed in large enough sample sizes.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Asymptotic Normality and Large Sample Inference

KEYWORDS:

Bloom's: Knowledge

9. In a regression model, if variance of the dependent variable, y , conditional on an explanatory variable, x , or $\text{Var}(y|x)$, is not constant, _____.

- a. the t statistics are invalid and confidence intervals are valid for small sample sizes
- b. the t statistics are valid and confidence intervals are invalid for small sample sizes
- c. the t statistics and the confidence intervals are valid no matter how large the sample size is
- d. the t statistics and the confidence intervals are both invalid no matter how large the sample size is

ANSWER:

d

RATIONALE: FEEDBACK: If variance of the dependent variable conditional on an explanatory variable is not a constant the usual t statistics and the confidence intervals are both invalid no matter how large the sample size is.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Asymptotic Normality and Large Sample Inference

KEYWORDS: Bloom's: Knowledge

10. If $\hat{\beta}_j$ is an OLS estimator of a regression coefficient associated with one of the explanatory variables, such that $j = 1, 2, \dots, n$, asymptotic standard error of $\hat{\beta}_j$ will refer to the:
- estimated variance of $\hat{\beta}_j$ when the error term is normally distributed.
 - estimated variance of a given coefficient when the error term is not normally distributed.
 - square root of the estimated variance of $\hat{\beta}_j$ when the error term is normally distributed.
 - square root of the estimated variance of $\hat{\beta}_j$ when the error term is not normally distributed.

ANSWER: d

RATIONALE: FEEDBACK: Asymptotic standard error refers to the square root of the estimated variance of $\hat{\beta}_j$ when the error term is not normally distributed.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Asymptotic Normality and Large Sample Inference

KEYWORDS: Bloom's: Knowledge

11. A useful rule of thumb is that standard errors are expected to shrink at a rate that is the inverse of the:
- square root of the sample size.
 - product of the sample size and the number of parameters in the model.
 - square of the sample size.
 - sum of the sample size and the number of parameters in the model.

ANSWER: a

RATIONALE: FEEDBACK: Standard errors can be expected to shrink at a rate that is the inverse of the square root of the sample size.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Asymptotic Normality and Large Sample Inference

KEYWORDS: Bloom's: Knowledge

12. An auxiliary regression refers to a regression that is used:
- when the dependent variables are qualitative in nature.
 - when the independent variables are qualitative in nature.
 - to compute a test statistic but whose coefficients are not of direct interest.
 - to compute coefficients which are of direct interest in the analysis.

ANSWER: c
RATIONALE: FEEDBACK: An auxiliary regression refers to a regression that is used to compute a test statistic but whose coefficients are not of direct interest.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Normality and Large Sample Inference
KEYWORDS: Bloom's: Knowledge

13. The n - R -squared statistic also refers to the:

- a. F statistic.
- b. t statistic.
- c. z statistic.
- d. LM statistic.

ANSWER: d
RATIONALE: FEEDBACK: The n - R -squared statistic also refers to the LM statistic.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Normality and Large Sample Inference
KEYWORDS: Bloom's: Knowledge

14. The LM statistic follows a:

- a. t distribution.
- b. f distribution.
- c. χ^2 distribution.
- d. binomial distribution.

ANSWER: c
RATIONALE: FEEDBACK: The LM statistic follows a χ^2 distribution.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Normality and Large Sample Inference
KEYWORDS: Bloom's: Knowledge

15. Which of the following statements is true?

- a. In large samples there are not many discrepancies between the outcomes of the F test and the LM test.
- b. Degrees of freedom of the unrestricted model are necessary for using the LM test.
- c. The LM test can be used to test hypotheses with single restrictions only and provides inefficient results for multiple restrictions.
- d. The LM statistic is derived on the basis of the normality assumption.

ANSWER: a
RATIONALE: FEEDBACK: In large samples there are not many discrepancies between the F test and the LM test because asymptotically the two statistics have the same probability of a Type 1 error.
POINTS: 1

DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Normality and Large Sample Inference
KEYWORDS: Bloom's: Knowledge

16. When the error term is not normally distributed, then $\sqrt{\text{Var}(\hat{\beta}_j)}$ is sometimes called the:

- a. asymptotic standard error.
- b. asymptotic t statistic.
- c. asymptotic confidence interval.
- d. asymptotic normality.

ANSWER: a

RATIONALE: FEEDBACK: When the error term is not normally distributed, then $\sqrt{\text{Var}(\hat{\beta}_j)}$ is sometimes called the asymptotic standard error.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Normality and Large Sample Inference
KEYWORDS: Bloom's: Knowledge

17. Which of the following statements is true under the Gauss-Markov assumptions?

- a. Among a certain class of estimators, OLS estimators are best linear unbiased, but are asymptotically inefficient.
- b. Among a certain class of estimators, OLS estimators are biased but asymptotically efficient.
- c. Among a certain class of estimators, OLS estimators are best linear unbiased and asymptotically efficient.
- d. The LM test is independent of the Gauss-Markov assumptions.

ANSWER: c

RATIONALE: FEEDBACK: Under the Gauss-Markov assumptions, among a certain class of estimators, OLS estimators are best linear unbiased and asymptotically efficient.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Efficiency of OLS
KEYWORDS: Bloom's: Knowledge

18. The Cauchy-Schwartz inequality implies that the asymptotic variance of $\sqrt{n}(\hat{\beta}_1 - \beta_1)$ is:

- a. greater than $\sqrt{n}(\hat{\beta}_1 - \beta_1)$.
- b. less than or equal to $\sqrt{n}(\hat{\beta}_1 - \beta_1)$.
- c. equal to $\sqrt{n}(\hat{\beta}_1 - \beta_1)$.
- d. less than $\sqrt{n}(\hat{\beta}_1 - \beta_1)$.

ANSWER: b

RATIONALE: FEEDBACK: The Cauchy-Schwartz inequality implies that the asymptotic variance

of $\sqrt{n}(\hat{\beta}_1 - \beta_1)$ is less than or equal to $\sqrt{n}(\tilde{\beta}_1 - \beta_1)$.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Efficiency of OLS
KEYWORDS: Bloom's: Knowledge

19. If variance of an independent variable in a regression model, say x_1 , is greater than 0, or $\text{Var}(x_1) > 0$, the inconsistency in $\hat{\beta}_1$ (estimator associated with x_1) is negative, if x_1 and the error term are positively related.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** If variance of an independent variable, say x_1 , is greater than 0, the inconsistency in $\hat{\beta}_1$ (estimator associated with x_1) is positive if x_1 and the error term are positively related.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Consistency
KEYWORDS: Bloom's: Knowledge

20. In the multiple regression model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + u$, if x_1 is correlated with u but the other independent variables are uncorrelated with u , then all of the OLS estimators are generally consistent.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** In the multiple regression model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + u$, if x_1 is correlated with u but the other independent variables are uncorrelated with u , then all of the OLS estimators are generally inconsistent.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Consistency
KEYWORDS: Bloom's: Knowledge

21. Even if the error terms in a regression equation, u_1, u_2, \dots, u_n , are not normally distributed, the estimated coefficients can be normally distributed.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** Even if the error terms in a regression equation, u_1, u_2, \dots, u_n , are not normally distributed, the estimated coefficients cannot be normally distributed.

POINTS: 1

DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Normality and Large Sample Inference
KEYWORDS: Bloom's: Knowledge

22. A normally distributed random variable is symmetrically distributed about its mean, it can take on any positive or negative value (but with zero probability), and more than 95% of the area under the distribution is within two standard deviations.

- a. True
- b. False

ANSWER: True
RATIONALE: **FEEDBACK:** A normally distributed random variable is symmetrically distributed about its mean, it can take on any positive or negative value (but with zero probability), and more than 95% of the area under the distribution is within two standard deviations.
POINTS: 1

DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Normality and Large Sample Inference
KEYWORDS: Bloom's: Knowledge

23. The F statistic is also referred to as the score statistic.

- a. True
- b. False

ANSWER: False
RATIONALE: **FEEDBACK:** The LM statistic is also referred to as the score statistic.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Normality and Large Sample Inference
KEYWORDS: Bloom's: Knowledge

24. The LM statistic requires estimation of the unrestricted model only.

- a. True
- b. False

ANSWER: False
RATIONALE: **FEEDBACK:** The LM statistic requires estimation of the restricted model only.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Normality and Large Sample Inference
KEYWORDS: Bloom's: Knowledge

25. If $\text{Cov}(z, x) \neq 0$, then z and x are correlated.

- a. True
- b. False

ANSWER: True

RATIONALE: If $\text{Cov}(z,x) \neq 0$, then z and x are correlated.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Efficiency of OLS
KEYWORDS: Bloom's: Knowledge

1. A change in the unit of measurement of the dependent variable in a model does not lead to a change in:
- the standard error of the regression.
 - the sum of squared residuals of the regression.
 - the goodness-of-fit of the regression.
 - the confidence intervals of the regression.

ANSWER: c

RATIONALE: **FEEDBACK:** Changing the unit of measurement of the dependent variable in a model does not lead to a change in the goodness of fit of the regression.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Effects of Data Scaling on OLS Statistics

KEYWORDS: Bloom's: Knowledge

2. Changing the unit of measurement of any independent variable, where log of the dependent variable appears in the regression:

- affects only the intercept coefficient.
- affects only the slope coefficient.
- affects both the slope and intercept coefficients.
- affects neither the slope nor the intercept coefficient.

ANSWER: a

RATIONALE: **FEEDBACK:** Changing the unit of measurement of any independent variable, where log of the independent variable appears in the regression only affects the intercept. This follows from the property $\log(ab) = \log(a) + \log(b)$.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Effects of Data Scaling on OLS Statistics

KEYWORDS: Bloom's: Comprehension

3. A variable is standardized in the sample:
- by multiplying by its mean.
 - by subtracting off its mean and multiplying by its standard deviation.
 - by subtracting off its mean and dividing by its standard deviation.
 - by multiplying by its standard deviation.

ANSWER: c

RATIONALE: **FEEDBACK:** A variable is standardized in the sample by subtracting off its mean and dividing by its standard deviation.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Effects of Data Scaling on OLS Statistics

KEYWORDS: Bloom's: Knowledge

4. Standardized coefficients are also referred to as:
- beta coefficients.

- b. y coefficients.
- c. alpha coefficients.
- d. j coefficients.

ANSWER: a

RATIONALE: FEEDBACK: Standardized coefficients are also referred to as beta coefficients.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Effects of Data Scaling on OLS Statistics

KEYWORDS: Bloom's: Knowledge

5. If a regression equation has only one explanatory variable, say x_1 , its standardized coefficient must lie in the range:

- a. -2 to 0.
- b. -1 to 1.
- c. 0 to 1.
- d. 0 to 2.

ANSWER: b

RATIONALE: FEEDBACK: If a regression equation has only one explanatory variable, say x_1 , its standardized coefficient is the correlation coefficient between the dependent variable and x_1 , and must lie in the range -1 to 1.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Effects of Data Scaling on OLS Statistics

KEYWORDS: Bloom's: Comprehension

6. In the following equation, gdp refers to gross domestic product, and FDI refers to foreign direct investment.

$$\log(\text{gdp}) = 2.65 + 0.527\log(\text{bankcredit}) + 0.222\text{FDI}$$

(0.13) (0.022) (0.017)

Which of the following statements is then true?

- a. If gdp increases by 1%, bank credit increases by 0.527%, the level of FDI remaining constant.
- b. If bank credit increases by 1%, gdp increases by 0.527%, the level of FDI remaining constant.
- c. If gdp increases by 1%, bank credit increases by $\log(0.527)\%$, the level of FDI remaining constant.
- d. If bank credit increases by 1%, gdp increases by $\log(0.527)\%$, the level of FDI remaining constant.

ANSWER: b

RATIONALE: FEEDBACK: The equation suggests that if bank credit increases by 1%, gdp increases by 0.527%. This is known from the value of the coefficient associated with bank credit.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: More on Functional Form

KEYWORDS: Bloom's: Application

7. In the following equation, gdp refers to gross domestic product, and FDI refers to foreign direct investment.

$$\log(gdp) = 2.65 + 0.527\log(bankcredit) + 0.222FDI$$

(0.13) (0.022) (0.017)

Which of the following statements is then true?

- a. If FDI increases by 1%, gdp increases by approximately 22.2%, the amount of bank credit remaining constant.
- b. If FDI increases by 1%, gdp increases by approximately 26.5%, the amount of bank credit remaining constant.
- c. If FDI increases by 1%, gdp increases by approximately 24.8%, the amount of bank credit remaining constant.
- d. If FDI increases by 1%, gdp increases by approximately 52.7%, the amount of bank credit remaining constant.

ANSWER:

c

RATIONALE:

FEEDBACK: The equation suggests that if FDI increases by 1%, gdp increases by $100(\exp(0.222) - 1)\%$. This equals $(1.24857 - 1) = 24.8\%$ approx.

POINTS:

1

DIFFICULTY:

Challenging

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

More on Functional Form

KEYWORDS:

Bloom's: Application

8. Which of the following statements is true when the dependent variable, $y > 0$?

- a. Taking log of a variable often expands its range.
- b. Models using $\log(y)$ as the dependent variable will satisfy CLM assumptions more closely than models using the level of y .
- c. Taking log of variables make OLS estimates more sensitive to extreme values.
- d. Taking logarithmic form of variables make the slope coefficients more responsive to rescaling.

ANSWER:

b

RATIONALE:

FEEDBACK: Models using $\log(y)$ as the dependent variable will satisfy CLM assumptions more closely than models using the level of y . This is because taking log of a variable gets it closer to a normal distribution.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

More on Functional Form

KEYWORDS:

Bloom's: Knowledge

9. Which of the following correctly identifies a limitation of logarithmic transformation of variables?

- a. Taking log of variables make OLS estimates more sensitive to extreme values in comparison to variables taken in level.
- b. Logarithmic transformations cannot be used if a variable takes on zero or negative values.
- c. Logarithmic transformations of variables are likely to lead to heteroskedasticity.
- d. Taking log of a variable often expands its range which can cause inefficient estimates.

ANSWER:

b

RATIONALE:

FEEDBACK: Logarithmic transformations cannot be used if a variable takes on zero or negative values.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

More on Functional Form

KEYWORDS:

Bloom's: Comprehension

10. Which of the following models is used quite often to capture decreasing or increasing marginal effects of a variable?
- Models with logarithmic functions
 - Models with quadratic functions
 - Models with variables in level
 - Models with interaction terms

ANSWER: b

RATIONALE: FEEDBACK: Models with quadratic functions are used quite often to capture decreasing or increasing marginal effects of a variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: More on Functional Form

KEYWORDS: Bloom's: Knowledge

11. One popular measure to describe the relationship between the dependent variable y and each explanatory variable is the:
- standardized effect.
 - interaction effect.
 - average partial effect.
 - partial effect.

ANSWER: c

RATIONALE: FEEDBACK: One popular measure to describe the relationship between the dependent variable y and each explanatory variable is the average partial effect.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: More on Functional Form

KEYWORDS: Bloom's: Knowledge

12. Which of the following correctly represents the equation for adjusted R^2 ?
- $\bar{R}^2 = 1 - [SSR/(n-1)]/[SST/(n+1)]$
 - $\bar{R}^2 = 1 - [SSR/(n-k-1)]/[SST/(n+1)]$
 - $\bar{R}^2 = 1 - [SSR/(n-k-1)]/[SST/(n-1)]$
 - $\bar{R}^2 = 1 - [SSR]/[SST/(n-1)]$

ANSWER: c

RATIONALE: FEEDBACK: $\bar{R}^2 = 1 - [SSR/(n-k-1)]/[SST/(n-1)]$

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: More on Goodness-of-Fit and Selection of Regressors

KEYWORDS: Bloom's: Knowledge

13. Which of the following correctly identifies an advantage of using adjusted R^2 over R^2 ?

- a. Adjusted R^2 corrects the bias in R^2 .
- b. Adjusted R^2 is easier to calculate than R^2 .
- c. The penalty of adding new independent variables is better understood through adjusted R^2 than R^2 .
- d. The adjusted R^2 can be calculated for models having logarithmic functions while R^2 cannot be calculated for such models.

ANSWER:

c

RATIONALE:

FEEDBACK: The penalty of adding new independent variables is better understood through adjusted R^2 than R^2 since its calculation is directly dependent on the number of independent variables included.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

More on Goodness-of-Fit and Selection of Regressors

KEYWORDS:

Bloom's: Knowledge

14. Two equations form a nonnested model when:

- a. one is logarithmic and the other is quadratic.
- b. neither equation is a special case of the other.
- c. each equation has the same independent variables.
- d. there is only one independent variable in both equations.

ANSWER:

b

RATIONALE:

FEEDBACK: Two equations form a nonnested model when neither equation is a special case of the other.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

More on Goodness-of-Fit and Selection of Regressors

KEYWORDS:

Bloom's: Knowledge

15. An independent variable can be included in a regression model:

- a. when it affects y and is uncorrelated with all of the independent variables of interest.
- b. when it does not affect y and is uncorrelated with all of the independent variables of interest.
- c. when it affects y and is correlated with all of the independent variables of interest.
- d. when it does not affect y and is correlated with all of the independent variables of interest.

ANSWER:

a

RATIONALE:

FEEDBACK: An independent variable can be included in a regression model when it affects y and is uncorrelated with all of the independent variables of interest.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

More on Goodness-of-Fit and Selection of Regressors

KEYWORDS:

Bloom's: Knowledge

16. A predicted value of a dependent variable:

- a. represents the difference between the expected value of the dependent variable and its actual value.
- b. is always equal to the actual value of the dependent variable.
- c. is independent of explanatory variables and can be estimated on the basis of the residual error term only.
- d. represents the expected value of the dependent variable given particular values for the explanatory variables.

ANSWER: d

RATIONALE: FEEDBACK: A predicted value of a dependent variable represents the expected value of the dependent variable given particular values for the explanatory variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Prediction and Residual Analysis

KEYWORDS: Bloom's: Knowledge

17. Residual analysis refers to the process of:

- a. examining individual observations to see whether the actual value of a dependent variable differs from the predicted value.
- b. calculating the squared sum of residuals to draw inferences for the consistency of estimates.
- c. transforming models with variables in level to logarithmic functions so as to understand the effect of percentage changes in the independent variable on the dependent variable.
- d. sampling and collection of data in such a way to minimize the squared sum of residuals.

ANSWER: a

RATIONALE: FEEDBACK: Residual analysis refers to the process of examining individual observations to see whether the actual value of a dependent variable differs from the predicted value.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Prediction and Residual Analysis

KEYWORDS: Bloom's: Knowledge

18. If we use $\hat{\alpha}_0 = n^{-1} \sum_{i=1}^n \exp(\hat{u}_i)$ to estimate α_0 , then the residual for predicting y_i is:

- a. $\hat{r}_i = y_i - \hat{\alpha}_0 \sum_{i=1}^n \exp(\widehat{\log y_i})$
- b. $\hat{r}_i = y_i + \hat{\alpha}_0 \sum_{i=1}^n \exp(\widehat{\log y_i})$
- c. $\hat{r}_i = y_i * \hat{\alpha}_0 \sum_{i=1}^n \exp(\widehat{\log y_i})$
- d. $\hat{r}_i = y_i / \hat{\alpha}_0 \sum_{i=1}^n \exp(\widehat{\log y_i})$

ANSWER: a

RATIONALE: FEEDBACK: If we use $\hat{\alpha}_0 = n^{-1} \sum_{i=1}^n \exp(\hat{u}_i)$ to estimate α_0 , then the residual for

predicting y_i is $\hat{y}_i = y_i - \hat{\alpha}_0 \sum_{i=1}^n \exp(\widehat{\log y_i})$.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Prediction and Residual Analysis
KEYWORDS: Bloom's: Knowledge

19. Beta coefficients are always greater than standardized coefficients.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: Beta coefficients are same as standardized coefficients.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Effects of Data Scaling on OLS Statistics
KEYWORDS: Bloom's: Knowledge

20. The centering of explanatory variables about their sample averages before creating quadratics or interactions forces the coefficient on the levels to be average partial effects.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: The centering of explanatory variables about their sample averages before creating quadratics or interactions forces the coefficient on the levels to be average partial effects.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: More on Functional Form
KEYWORDS: Bloom's: Knowledge

21. If a new independent variable is added to a regression equation, the adjusted R^2 increases only if the absolute value of the t statistic of the new variable is greater than one.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: If a new independent variable is added to a regression equation, the adjusted R^2 increases only if the absolute value of the t statistic of the new variable is greater than one in absolute value.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: More on Goodness-of-Fit and Selection of Regressors

KEYWORDS: Bloom's: Knowledge

22. If the R -squared value is low, then using OLS equation is very easy to predict individual future outcomes on y given a set of values for the explanatory variables.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: If the R -squared value is low, then using OLS equation is difficult to predict individual future outcomes on y given a set of values for the explanatory variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: More on Goodness-of-Fit and Selection of Regressors

KEYWORDS: Bloom's: Knowledge

23. F statistic can be used to test nonnested models.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: F statistic can be used only to test nested models.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: More on Goodness-of-Fit and Selection of Regressors

KEYWORDS: Bloom's: Knowledge

24. Predictions of a dependent variable are subject to sampling variation.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: Predictions of a dependent variable are subject to sampling variation since they are obtained using OLS estimators.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Prediction and Residual Analysis

KEYWORDS: Bloom's: Knowledge

25. To make predictions of logarithmic dependent variables, they first have to be converted to their level forms.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: It is possible to make predictions of dependent variables when they are in their logarithmic form. It is not necessary to convert them into their level forms.

POINTS: 1

DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Prediction and Residual Analysis
KEYWORDS: Bloom's: Knowledge

1. A _____ variable is used to incorporate qualitative information in a regression model.
- dependent
 - continuous
 - binomial
 - dummy

ANSWER: d

RATIONALE: FEEDBACK: A dummy variable or binary variable is used to incorporate qualitative information in a regression model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Describing Qualitative Information

KEYWORDS: Bloom's: Knowledge

2. In a regression model, which of the following will be described using a binary variable?
- Whether it rained on a particular day or it did not
 - The volume of rainfall during a year
 - The percentage of humidity in air on a particular day
 - The concentration of dust particles in air

ANSWER: a

RATIONALE: FEEDBACK: A binary variable is used to describe qualitative information in regression model. Therefore, such a variable will be used to describe whether it rained on a particular day or it did not.

POINTS: 1

DIFFICULTY: Medium

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Describing Qualitative Information

KEYWORDS: Bloom's: Comprehension

3. Which of the following is true of dummy variables?
- A dummy variable always takes a value less than 1.
 - A dummy variable always takes a value higher than 1.
 - A dummy variable takes a value of 0 or 1.
 - A dummy variable takes a value of 1 or 10.

ANSWER: c

RATIONALE: FEEDBACK: A dummy variable takes a value of 0 or 1.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Describing Qualitative Information

KEYWORDS: Bloom's: Knowledge

4. The following simple model is used to determine the annual savings of an individual on the basis of his annual income and education.

Savings = $\beta_0 + \delta_0 \text{Edu} + \beta_1 \text{Inc} + u$ The variable 'Edu' takes a value of 1 if the person is educated and the variable 'Inc' measures the income of the individual.

Refer to the model above. The inclusion of another binary variable in this model that takes a value of 1 if a person is uneducated, will give rise to the problem of _____.

- a. omitted variable bias
- b. self-selection
- c. dummy variable trap
- d. heteroskedasticity

ANSWER:

c

RATIONALE:

FEEDBACK: The inclusion of another dummy variable in this model would introduce perfect collinearity and lead to a dummy variable trap.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS:

Describing Qualitative Information

KEYWORDS:

Bloom's: Application

5. The following simple model is used to determine the annual savings of an individual on the basis of his annual income and education.

$$\text{Savings} = \beta_0 + \delta_0 \text{Edu} + \beta_1 \text{Inc} + u$$

The variable 'Edu' takes a value of 1 if the person is educated and the variable 'Inc' measures the income of the individual.

Refer to the model above. The benchmark group in this model is _____.

- a. the group of educated people
- b. the group of uneducated people
- c. the group of individuals with a high income
- d. the group of individuals with a low income

ANSWER:

b

RATIONALE:

FEEDBACK: The benchmark group is the group against which comparisons are made. In this case, the savings of a literate person is being compared to the savings of an illiterate person; therefore, the group of illiterate people is the base group or benchmark group.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS:

A Single Dummy Independent Variable

KEYWORDS:

Bloom's: Application

6. The following simple model is used to determine the annual savings of an individual on the basis of his annual income and education.

$$\text{Savings} = \beta_0 + \delta_0 \text{Edu} + \beta_1 \text{Inc} + u$$

The variable 'Edu' takes a value of 1 if the person is educated and the variable 'Inc' measures the income of the individual.

Refer to the above model. If $\delta_0 > 0$, _____.

- a. uneducated people have higher savings than those who are educated
- b. educated people have higher savings than those who are not educated
- c. individuals with lower income have higher savings
- d. individual with lower income have higher savings

ANSWER: b

RATIONALE: FEEDBACK: The coefficient δ_0 measures the impact of education on an individual's annual savings. If it has a positive impact, as in this case, educated people should have higher savings.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: A Single Dummy Independent Variable

KEYWORDS: Bloom's: Application

7. The income of an individual in Budopia depends on his ethnicity and several other factors which can be measured quantitatively. If there are 5 ethnic groups in Budopia, how many dummy variables should be included in the regression equation for income determination in Budopia?

- a. 1
- b. 5
- c. 6
- d. 4

ANSWER: d

RATIONALE: FEEDBACK: If a regression model is to have different intercepts for, say, g groups or categories, we need to include $g - 1$ dummy variables in the model along with an intercept. In this case, the regression equation should include $5 - 1 = 4$ dummy variables since there are 5 ethnic groups.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: Using Dummy Variables for Multiple Categories

KEYWORDS: Bloom's: Application

8. The sum of squared residuals form of the F statistic can be computed easily even when many independent variables are involved; this particular F statistic is usually called the _____ in econometrics.

- a. Chow statistic
- b. t statistic
- c. χ^2 statistic
- d. LM statistic

ANSWER: a

RATIONALE: FEEDBACK: The sum of squared residuals form of the F statistic can be computed easily even when many independent variables are involved; this particular F statistic is usually called the Chow statistic in econometrics.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Interactions Involving Dummy Variables

KEYWORDS: Bloom's: Knowledge

9. The quarterly increase in an employee's salary depends on the rating of his work by his employer and several other factors as shown in the model below:

Increase in salary = $\beta_0 + \delta_0$ Rating + other factors. The variable 'Rating' is a(n) _____.

- a. dependent variable
- b. ordinal variable
- c. continuous variable
- d. Poisson variable

ANSWER: b

RATIONALE: FEEDBACK: The value of the variable 'Rating' depends on the employer's rating of the worker. Therefore, it incorporates ordinal information and is called an ordinal variable.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: Using Dummy Variables for Multiple Categories

KEYWORDS: Bloom's: Application

10. Which of the following is true of Chow test?

- a. It is a type of t test.
- b. It is a type of sign test.
- c. It is only valid under homoskedasticity.
- d. It is only valid under heteroskedasticity.

ANSWER: c

RATIONALE: FEEDBACK: Since the Chow test is just an F test, it is only valid under homoskedasticity.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Interactions Involving Dummy Variables

KEYWORDS: Bloom's: Knowledge

11. Which of the following is true of dependent variables?

- a. A dependent variable can only have a numerical value.
- b. A dependent variable cannot have more than 2 values.
- c. A dependent variable can be binary.
- d. A dependent variable cannot have a qualitative meaning.

ANSWER: c

RATIONALE: FEEDBACK: A dependent variable is binary if it has a qualitative meaning.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: A Binary Dependent Variable: The Linear Probability Model

KEYWORDS: Bloom's: Knowledge

12. In the following regression equation, y is a binary variable:

$$y = \beta_0 + \beta_1 x_1 + \dots + \beta_k x_k + u$$

In this case, the estimated slope coefficient, $\hat{\beta}_1$ measures ____.

- a. the predicted change in the value of y when x_1 increases by one unit, everything else remaining constant
- b. the predicted change in the value of y when x_1 decreases by one unit, everything else remaining constant
- c. the predicted change in the probability of success when x_1 decreases by one unit, everything else remaining

constant

- d. the predicted change in the probability of success when x_1 increases by one unit, everything else remaining constant

ANSWER: d

RATIONALE: FEEDBACK: A binary dependent variable is used when a regression model is used to explain a qualitative event. The dependent variable takes a value of 1 when the event takes place (success) and it takes a value of zero when the event does not take place. The coefficient of an independent variable in this case measures the predicted change in the probability of success when the independent variable increases by one unit.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: A Binary Dependent Variable: The Linear Probability Model

KEYWORDS: Bloom's: Knowledge

13. Consider the following regression equation: $y = \beta_0 + \beta_1 x_1 + \dots + \beta_k x_k + u$

In which of the following cases, the dependent variable is binary?

- a. y indicates the gross domestic product of a country
- b. y indicates whether an adult is a college dropout
- c. y indicates household consumption expenditure
- d. y indicates the number of children in a family

ANSWER: b

RATIONALE: FEEDBACK: The dependent variable, y is binary if it is used to indicate a qualitative outcome.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: A Binary Dependent Variable: The Linear Probability Model

KEYWORDS: Bloom's: Application

14. Which of the following Gauss-Markov assumptions is violated by the linear probability model?

- a. The assumption of constant variance of the error term.
- b. The assumption of zero conditional mean of the error term.
- c. The assumption of no exact linear relationship among independent variables.
- d. The assumption that none of the independent variables are constants.

ANSWER: a

RATIONALE: FEEDBACK: The linear probability model violates the assumption of constant variance of the error term.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: A Binary Dependent Variable: The Linear Probability Model

KEYWORDS: Bloom's: Knowledge

15. Which of the following problems can arise in policy analysis and program evaluation using a multiple linear regression model?

- a. There exists homoskedasticity in the model.

- b. The model can produce predicted probabilities that are less than zero and greater than one.
- c. The model leads to the omitted variable bias as only two independent factors can be included in the model.
- d. The model leads to an overestimation of the effect of independent variables on the dependent variable.

ANSWER: b

RATIONALE: FEEDBACK: The model can produce predicted probabilities that are less than zero and greater than one.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: More on Policy Analysis and Program Evaluation

KEYWORDS: Bloom's: Knowledge

16. In a self-selection problem, the explanatory variables can be:

- a. endogenous.
- b. exogenous.
- c. independent.
- d. random.

ANSWER: a

RATIONALE: FEEDBACK: In a self-selection problem, the explanatory variables can be endogenous.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: More on Policy Analysis and Program Evaluation

KEYWORDS: Bloom's: Knowledge

17. A binary response is the most extreme form of a discrete random variable that takes on:

- a. only two values, zero and one.
- b. only one value, zero.
- c. only one value, one.
- d. any value.

ANSWER: a

RATIONALE: FEEDBACK: is the most extreme form of a discrete random variable that takes on only two values, zero and one.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Interpreting Regression Results with Discrete Dependent Variables

KEYWORDS: Bloom's: Knowledge

18. Consider the following regression equation: $y = \beta_0 + \beta_1 x_1 + \dots + \beta_k x_k + u$

In which of the following cases, is 'y' a discrete variable?

- a. y indicates the gross domestic product of a country
- b. y indicates the total volume of rainfall during a year
- c. y indicates household consumption expenditure

d. y indicates the number of children in a family

ANSWER: d
RATIONALE: FEEDBACK: The number of children in a family can only take a small set of integer values. Therefore, y is a discrete variable if it measures the number of children in a family.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Interpreting Regression Results with Discrete Dependent Variables
KEYWORDS: Bloom's: Knowledge

19. A binary variable is a variable whose value changes with a change in the number of observations.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: A binary variable is one whose value depends on the event taking place.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Describing Qualitative Information
KEYWORDS: Bloom's: Knowledge

20. If the p -value of an F statistic 2.63 is 0.034, then we can say that the problem of interest is significant at the 5% level.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: If the p -value of an F statistic 2.63 is 0.034, then we can say that the problem of interest is significant at the 5% level.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Interactions Involving Dummy Variables
KEYWORDS: Bloom's: Comprehension

21. A dummy variable trap arises when a single dummy variable describes a given number of groups.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: A dummy variable trap arises when too many dummy variables describe a given number of groups.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: A Single Dummy Independent Variable
KEYWORDS: Bloom's: Knowledge

22. The dummy variable coefficient for a particular group represents the estimated difference in intercepts between that group and the base group.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The dummy variable coefficient for a particular group represents the estimated difference in intercepts between that group and the base group.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Using Dummy Variables for Multiple Categories

KEYWORDS: Bloom's: Knowledge

23. The multiple linear regression model with a binary dependent variable is called the linear probability model.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The multiple linear regression model with a binary dependent variable is called the linear probability model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: A Binary Dependent Variable: The Linear Probability Model

KEYWORDS: Bloom's: Knowledge

24. A problem that often arises in policy and program evaluation is that individuals (or firms or cities) choose whether or not to participate in certain behaviors or programs.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: A problem that often arises in policy and program evaluation is that individuals (or firms or cities) choose whether or not to participate in certain behaviors or programs and their choice depends on several other factors. It is not possible to control for these factors while examining the effect of the programs.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: More on Policy Analysis and Program Evaluation

KEYWORDS: Bloom's: Knowledge

25. The parameters in a linear probability model can be interpreted as measuring the change in the probability that $y = 1$ due to a one-unit increase in an explanatory variable.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The parameters in a linear probability model can be interpreted as measuring the change in the probability that $y = 1$ due to a one-unit increase in an

explanatory variable.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Interpreting Regression Results with Discrete Dependent Variables

KEYWORDS:

Bloom's: Knowledge

1. Which of the following is true of heteroskedasticity?
- Heteroskedasticity causes inconsistency in the Ordinary Least Squares estimators.
 - Population R^2 is affected by the presence of heteroskedasticity.
 - The Ordinary Least Square estimators are not the best linear unbiased estimators if heteroskedasticity is present.
 - It is not possible to obtain F statistics that are robust to heteroskedasticity of an unknown form.

ANSWER:

c

RATIONALE:

FEEDBACK: The Ordinary Least Square estimators are no longer the best linear unbiased estimators if heteroskedasticity is present in a regression model.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Consequences of Heteroskedasticity for OLS

KEYWORDS:

Bloom's: Knowledge

2. Consider the following regression model: $y_i = \beta_0 + \beta_1 x_i + u_i$. If the first four Gauss-Markov assumptions hold true, and the error term contains heteroskedasticity, then _____.

- $\text{Var}(u_i|x_i) = 0$
- $\text{Var}(u_i|x_i) = 1$
- $\text{Var}(u_i|x_i) = \sigma_i^2$
- $\text{Var}(u_i|x_i) = \sigma$

ANSWER:

c

RATIONALE:

FEEDBACK: If the first four Gauss-Markov assumptions hold and the error term contains heteroskedasticity, then $\text{Var}(u_i|x_i) = \sigma_i^2$.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Heteroskedasticity-Robust Inference after OLS Estimation

KEYWORDS:

Bloom's: Knowledge

3. The general form of the t statistic is _____.

- $$t = \frac{\text{estimate} - \text{hypothesized value}}{\text{standard error}}$$
- $$t = \frac{\text{hypothesized value} - \text{estimate}}{\text{standard error}}$$
- $$t = \frac{\text{standard error}}{\text{estimate} - \text{hypothesized value}}$$
- $$t = \text{estimate} - \text{hypothesized value}$$

ANSWER:

a

RATIONALE:

FEEDBACK: The general form of the t statistic is

$$t = \frac{\text{estimate} - \text{hypothesized value}}{\text{standard error}}.$$

POINTS:

1

DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Heteroskedasticity-Robust Inference after OLS Estimation
KEYWORDS: Bloom's: Knowledge

4. Which of the following is true of the OLS t statistics?
- The heteroskedasticity-robust t statistics are justified only if the sample size is large.
 - The heteroskedasticity-robust t statistics are justified only if the sample size is small.
 - The usual t statistics do not have exact t distributions if the sample size is large.
 - In the presence of homoskedasticity, the usual t statistics do not have exact t distributions if the sample size is small.

ANSWER: a
RATIONALE: FEEDBACK: The heteroskedasticity-robust t statistics are justified only if the sample size is large.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Heteroskedasticity-Robust Inference after OLS Estimation
KEYWORDS: Bloom's: Knowledge

5. The heteroskedasticity-robust _____ is also called the heteroskedasticity-robust Wald statistic.
- t statistic
 - F statistic
 - LM statistic
 - z statistic

ANSWER: b
RATIONALE: FEEDBACK: The heteroskedasticity-robust F statistic is also called the heteroskedasticity-robust Wald statistic.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Heteroskedasticity-Robust Inference after OLS Estimation
KEYWORDS: Bloom's: Knowledge

6. The square root of the quantity $\widehat{\text{Var}}(\hat{\beta}_j) = \frac{\sum_{i=1}^n \hat{r}_{ij}^2 \hat{u}_i^2}{\text{SSR}_j^2}$ is called the _____ for $\hat{\beta}_j$.

- heteroskedasticity-robust t statistic
- heteroskedasticity-robust standard error
- heteroskedasticity-robust F statistic
- heteroskedasticity-robust Wald statistic

ANSWER: b

RATIONALE:

FEEDBACK: The square root of the quantity $\widehat{\text{Var}}(\hat{\beta}_j) = \frac{\sum_{i=1}^n \hat{p}_i^2 \hat{u}_i^2}{\text{SSR}_j^2}$ is called the *heteroskedasticity-robust standard error for $\hat{\beta}_j$* .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Heteroskedasticity-Robust Inference after OLS Estimation

KEYWORDS: Bloom's: Knowledge

7. Which of the following tests helps in the detection of heteroskedasticity?

- a. The Breusch-Pagan test
- b. The Breusch-Godfrey test
- c. The Durbin-Watson test
- d. The Chow test

ANSWER: a

RATIONALE: FEEDBACK: The Breusch-Pagan test is used for the detection of heteroskedasticity in a regression model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Heteroskedasticity

KEYWORDS: Bloom's: Knowledge

8. What will you conclude about a regression model if the Breusch-Pagan test results in a small p -value?

- a. The model contains homoskedasticity.
- b. The model contains heteroskedasticity.
- c. The model contains dummy variables.
- d. The model omits some important explanatory factors.

ANSWER: b

RATIONALE: FEEDBACK: The Breusch-Pagan test results in a small p -value if the regression model contains heteroskedasticity.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Heteroskedasticity

KEYWORDS: Bloom's: Knowledge

9. A test for heteroskedasticity can be significant if ____.

- a. the Breusch-Pagan test results in a large p -value
- b. the White test results in a large p -value
- c. the functional form of the regression model is misspecified
- d. the regression model includes too many independent variables

ANSWER: c

RATIONALE: FEEDBACK: A test for heteroskedasticity can be significant if the functional form of the regression model is misspecified.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Heteroskedasticity

KEYWORDS: Bloom's: Knowledge

10. Which of the following is a difference between the White test and the Breusch-Pagan test?

- a. The White test is used for detecting heteroskedasticity in a linear regression model while the Breusch-Pagan test is used for detecting autocorrelation.
- b. The White test is used for detecting autocorrelation in a linear regression model while the Breusch-Pagan test is used for detecting heteroskedasticity. .
- c. The number of regressors used in the White test is larger than the number of regressors used in the Breusch-Pagan test.
- d. The number of regressors used in the Breusch-Pagan test is larger than the number of regressors used in the White test.

ANSWER: c

RATIONALE: FEEDBACK: The White test includes the squares and cross products of all independent variables. Therefore, the number of regressors is larger for the White test.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Heteroskedasticity

KEYWORDS: Bloom's: Knowledge

11. Which of the following is true of the White test?

- a. The White test is used to detect the presence of multicollinearity in a linear regression model.
- b. The White test cannot detect forms of heteroskedasticity that invalidate the usual Ordinary Least Squares standard errors.
- c. The White test can detect the presence of heteroskedasticity in a linear regression model even if the functional form is misspecified.
- d. The White test assumes that the square of the error term in a regression model is uncorrelated with all the independent variables, their squares and cross products.

ANSWER: d

RATIONALE: FEEDBACK: The White test assumes that the square of the error term in a regression model is uncorrelated with all the independent variables, the squares of independent variables and all the cross products.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Heteroskedasticity

KEYWORDS: Bloom's: Knowledge

12. Which of the following is true?

- a. In ordinary least squares estimation, each observation is given a different weight.
- b. In weighted least squares estimation, each observation is given an identical weight.
- c. In weighted least squares estimation, less weight is given to observations with a higher error variance.

d. In ordinary least squares estimation, less weight is given to observations with a lower error variance.

ANSWER:

c

RATIONALE:

FEEDBACK: In weighted Least Squares estimation, less weight is given to observations with a higher error variance.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Weighted Least Squares Estimation

KEYWORDS:

Bloom's: Knowledge

13. Weighted least squares estimation is used only when _____.

- a. the dependent variable in a regression model is binary
- b. the independent variables in a regression model are correlated
- c. the error term in a regression model has a constant variance
- d. the functional form of the error variances is known

ANSWER:

d

RATIONALE:

FEEDBACK: Weighted Least Squares estimation is used only when the functional form of the error variances is known.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Weighted Least Squares Estimation

KEYWORDS:

Bloom's: Knowledge

14. Consider the following regression equation: $y = \beta_0 + \beta_1 x_1 + u$. Which of the following indicates a functional form misspecification in $E(y|x)$?

- a. Ordinary Least Squares estimates equal Weighted Least Squares estimates.
- b. Ordinary Least Squares estimates exceed Weighted Least Squares estimates by a small magnitude.
- c. Weighted Least Squares estimates exceed Ordinary Least Squares estimates by a small magnitude.
- d. Ordinary Least Square estimates are positive while Weighted Least Squares estimates are negative.

ANSWER:

d

RATIONALE:

FEEDBACK: If Ordinary Least Square estimates are positive while Weighted Least Squares estimates are negative, the functional form of a regression equation is said to be misspecified.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Weighted Least Squares Estimation

KEYWORDS:

Bloom's: Knowledge

15. Which of the following tests is used to compare the Ordinary Least Squares (OLS) estimates and the Weighted Least Squares (WLS) estimates?

- a. The White test
- b. The Hausman test
- c. The Durbin-Watson test
- d. The Breusch-Godfrey test

ANSWER:

b

RATIONALE: FEEDBACK: The Hausman test can be used to formally compare the OLS and WLS estimates to see if they differ by more than sampling error suggests they should.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Weighted Least Squares Estimation

KEYWORDS: Bloom's: Knowledge

16. The generalized least square (GLS) is an efficient procedure that weights each squared residual by the:

- a. conditional variance of u_i given x_i .
- b. expected value of u_i given x_i .
- c. inverse of the conditional variance of u_i given x_i .
- d. square root of the inverse of the conditional variance of u_i given x_i .

ANSWER: c

RATIONALE: FEEDBACK: The generalized least square (GLS) is an efficient procedure that weights each squared residual by the inverse of the conditional variance of u_i given x_i .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Weighted Least Squares Estimation

KEYWORDS: Bloom's: Knowledge

17. The linear probability model contains heteroskedasticity unless _____.

- a. the intercept parameter is zero
- b. all the slope parameters are positive
- c. all the slope parameters are zero
- d. the independent variables are binary

ANSWER: c

RATIONALE: FEEDBACK: The linear probability model contains heteroskedasticity unless all the slope parameters are zero.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Linear Probability Model Revisited

KEYWORDS: Bloom's: Knowledge

18. Which of the following is true?

- a. If we can estimate h_i for each i , it means that we can proceed directly with WLS estimation.
- b. The WLS method fails if \hat{h}_i is negative or zero for any observation.
- c. The simplest way to deal with homoskedasticity in the linear probability model is to continue to use OLS estimation.
- d. The probability $p(x)$ depends on the error term.

ANSWER: b

RATIONALE: FEEDBACK: The WLS method fails if \hat{h}_i is negative or zero for any observation.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Linear Probability Model Revisited
KEYWORDS: Bloom's: Knowledge

19. The interpretation of goodness-of-fit measures changes in the presence of heteroskedasticity.
a. True
b. False

ANSWER: False
RATIONALE: FEEDBACK: The interpretation of goodness-of-fit measures is unaffected by the presence of heteroskedasticity.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Consequences of Heteroskedasticity for OLS
KEYWORDS: Bloom's: Knowledge

20. The population R -squared is affected when heteroskedasticity is present in $\text{Var}(u|x_1, \dots, x_k)$.
a. True
b. False

ANSWER: False
RATIONALE: FEEDBACK: The population R -squared is unaffected when heteroskedasticity is present in $\text{Var}(u|x_1, \dots, x_k)$.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Consequences of Heteroskedasticity for OLS
KEYWORDS: Bloom's: Knowledge

21. Multicollinearity among the independent variables in a linear regression model causes the heteroskedasticity-robust standard errors to be large.
a. True
b. False

ANSWER: True
RATIONALE: FEEDBACK: Multicollinearity among the independent variables in a linear regression model causes the heteroskedasticity-robust standard errors to be large.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Heteroskedasticity-Robust Inference after OLS Estimation
KEYWORDS: Bloom's: Knowledge

22. When the error variance differs across the two groups, we can obtain a heteroskedasticity-robust Chow test

by including a dummy variable distinguishing the two groups along with interactions between that dummy variable and all other explanatory variables.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: When the error variance differs across the two groups, we can obtain a heteroskedasticity-robust Chow test by including a dummy variable distinguishing the two groups along with interactions between that dummy variable and all other explanatory variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Heteroskedasticity-Robust Inference after OLS Estimation

KEYWORDS: Bloom's: Knowledge

23. If the Breusch-Pagan Test for heteroskedasticity results in a large p -value, the null hypothesis of homoskedasticity is rejected.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: If the Breusch-Pagan Test for heteroskedasticity results in a large p -value, the null hypothesis of heteroskedasticity is rejected.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Heteroskedasticity

KEYWORDS: Bloom's: Knowledge

24. The generalized least square estimators for correcting heteroskedasticity are called weighed least squares estimators.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The generalized least square estimators for correcting heteroskedasticity are called weighed least squares estimators.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Weighted Least Squares Estimation

KEYWORDS: Bloom's: Knowledge

25. The linear probability model always contains heteroskedasticity when the dependent variable is a binary variable unless all of the slope parameters are zero.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The linear probability model always contains heteroskedasticity when the dependent variable is a binary variable unless all of the slope parameters are zero.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Linear Probability Model Revisited
KEYWORDS: Bloom's: Knowledge



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1. Consider the following regression model: $\log(y) = \beta_0 + \beta_1 x_1 + \beta_2 x_1^2 + \beta_3 x_3 + u$. This model will suffer from functional form misspecification if _____.

- a. β_0 is omitted from the model
- b. u is heteroskedastic
- c. x_1^2 is omitted from the model
- d. x_3 is a binary variable

ANSWER: c

RATIONALE: FEEDBACK: The model suffers from functional form misspecification if x_1^2 is omitted from the model since it is a function of x_1 which is an observed explanatory variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Functional Form Misspecification

KEYWORDS: Bloom's: Comprehension

2. A regression model suffers from functional form misspecification if _____.

- a. a key variable is binary.
- b. the dependent variable is binary.
- c. an interaction term is omitted.
- d. the coefficient of a key variable is zero.

ANSWER: c

RATIONALE: FEEDBACK: A regression model suffers from functional form misspecification if an interaction term is omitted.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Functional Form Misspecification

KEYWORDS: Bloom's: Knowledge

3. Which of the following is true?

- a. A functional form misspecification can occur if the level of a variable is used when the logarithm is more appropriate.
- b. A functional form misspecification occurs only if a key variable is uncorrelated with the error term.
- c. A functional form misspecification does not lead to biasedness in the ordinary least squares estimators.
- d. A functional form misspecification does not lead to inconsistency in the ordinary least squares estimators.

ANSWER: a

RATIONALE: FEEDBACK: A functional form misspecification can occur if the level of a variable is used when the logarithm is more appropriate.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Functional Form Misspecification

KEYWORDS: Bloom's: Knowledge

4. Which of the following is true of Regression Specification Error Test (RESET)?

- a. It tests if the functional form of a regression model is misspecified.
- b. It detects the presence of dummy variables in a regression model.
- c. It helps in the detection of heteroskedasticity when the functional form of the model is correctly specified.
- d. It helps in the detection of multicollinearity among the independent variables in a regression model.

ANSWER: a

RATIONALE: FEEDBACK: It tests if the functional form of a regression model is misspecified.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Functional Form Misspecification

KEYWORDS: Bloom's: Knowledge

5. Which of the following is a test of nonnested models?

- a. Davidson-MacKinnon test
- b. Standard F test
- c. Regression Specification Error Test
- d. White test

ANSWER: a

RATIONALE: FEEDBACK: The Davidson-MacKinnon test is one of the tests used for the test of nonnested models.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Functional Form Misspecification

KEYWORDS: Bloom's: Knowledge

6. A proxy variable ____.

- a. increases the error variance of a regression model
- b. cannot contain binary information
- c. is used when data on a key independent variable is unavailable
- d. is detected by running the Davidson-MacKinnon test

ANSWER: c

RATIONALE: FEEDBACK: A proxy variable is used when data on a key independent variable is unavailable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Using Proxy Variables for Unobserved Explanatory Variables

KEYWORDS: Bloom's: Knowledge

7. Which of the following assumptions is needed for the plug-in solution to the omitted variables problem to provide consistent estimators?

- a. The error term in the regression model exhibits heteroskedasticity.
- b. The error term in the regression model is uncorrelated with all the independent variables.
- c. The proxy variable is uncorrelated with the dependent variable.
- d. The proxy variable has zero conditional mean.

ANSWER: b
RATIONALE: FEEDBACK: The error term in the regression model is uncorrelated with all the independent variables.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Using Proxy Variables for Unobserved Explanatory Variables
KEYWORDS: Bloom's: Knowledge

8. Which of the following is a drawback of including proxy variables in a regression model?
- a. It leads to misspecification analysis.
 - b. It reduces the error variance.
 - c. It increases the error variance.
 - d. It exacerbates multicollinearity.

ANSWER: d
RATIONALE: FEEDBACK: The inclusion of a proxy variable in a regression model exacerbates multicollinearity.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Using Proxy Variables for Unobserved Explanatory Variables
KEYWORDS: Bloom's: Knowledge

9. Consider the following equation for household consumption expenditure:

$$\text{Consmptn} = \beta_0 + \beta_1 \text{Inc} + \beta_2 \text{Consmptn}_{-1} + u$$

where 'Consmptn' measures the monthly consumption expenditure of a household, 'Inc' measures household income and 'Consmptn₋₁' is the consumption expenditure in the previous month. Consmptn₋₁ is a _____ variable.

- a. exogenous
- b. binary variable
- c. lagged dependent
- d. proxy variable

ANSWER: c
RATIONALE: FEEDBACK: 'Consmptn₋₁' is a lagged dependent variable in this model.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Using Proxy Variables for Unobserved Explanatory Variables
KEYWORDS: Bloom's: Knowledge

10. A measurement error occurs in a regression model when _____.
- a. the observed value of a variable used in the model differs from its actual value
 - b. the dependent variable is binary
 - c. the partial effect of an independent variable depends on unobserved factors
 - d. the model includes more than two independent variables

ANSWER: a
RATIONALE: FEEDBACK: A measurement error occurs in a regression model when the observed value of

a variable used in the model differs from its actual value.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Properties of OLS under Measurement Error

KEYWORDS:

Bloom's: Knowledge

11. The classical errors-in-variables (CEV) assumption is that _____.

- a. the error term in a regression model is correlated with all observed explanatory variables
- b. the error term in a regression model is uncorrelated with all observed explanatory variables
- c. the measurement error is correlated with the unobserved explanatory variable
- d. the measurement error is uncorrelated with the unobserved explanatory variable

ANSWER:

d

RATIONALE:

FEEDBACK: The classical errors-in-variables (CEV) assumption is that the measurement error is uncorrelated with the unobserved explanatory variable.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Properties of OLS under Measurement Error

KEYWORDS:

Bloom's: Knowledge

12. Which of the following is true of measurement error?

- a. If measurement error in a dependent variable has zero mean, the ordinary least squares estimators for the intercept are biased and inconsistent.
- b. If measurement error in an independent variable is uncorrelated with the variable, the ordinary least squares estimators are unbiased.
- c. If measurement error in an independent variable is uncorrelated with other independent variables, all estimators are biased.
- d. If measurement error in a dependent variable is correlated with the independent variables, the ordinary least squares estimators are unbiased.

ANSWER:

b

RATIONALE:

FEEDBACK: If measurement error in an independent variable is uncorrelated with the variable, the ordinary least squares estimators are unbiased.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Properties of OLS under Measurement Error

KEYWORDS:

Bloom's: Knowledge

13. A complete cases estimator is an estimator that uses:

only observations with a complete set of data on y and x_1, \dots, x_k

- a. only observations with a complete set of data on x_1, \dots, x_k .
- b. complete information about the residuals.
- c. only observations with a complete set of data on y and x_1, \dots, x_k .
- d. complete information about the outliers.

ANSWER:

c

RATIONALE: FEEDBACK: An estimator that uses only observations with a complete set of data on y and x_1, \dots, x_k is called complete cases estimator.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Missing Data, Nonrandom Samples, and Outlying Observations

KEYWORDS: Bloom's: Knowledge

14. How many new variables should be created for a multiple regression model where data are always available for y and x_1, x_2, \dots, x_{k-1} but are sometimes missing for the explanatory variable x_k ?

- a. One variable
- b. Two variables
- c. Three variables
- d. Four variables

ANSWER: b

RATIONALE: FEEDBACK: Two new variables should be created for a multiple regression model where data are always available for y and x_1, x_2, \dots, x_{k-1} but are sometimes missing for the explanatory variable x_k . For a unit i , the first variable, say z_{ik} , is defined to be x_{ik} when x_{ik} is observed, and zero otherwise. The second variable is a "missing data indicator," say m_{ik} , which equals one when x_{ik} is missing and equals zero when x_{ik} is observed.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Missing Data, Nonrandom Samples, and Outlying Observations

KEYWORDS: Bloom's: Knowledge

15. Sample selection based on the dependent variable is called _____.

- a. random sample selection
- b. endogenous sample selection
- c. exogenous sample selection
- d. stratified sample selection

ANSWER: b

RATIONALE: FEEDBACK: Sample selection based on the dependent variable is called endogenous sample selection.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Missing Data, Nonrandom Samples, and Outlying Observations

KEYWORDS: Bloom's: Knowledge

16. The method of data collection in which the population is divided into nonoverlapping, exhaustive groups is called _____.

- a. random sampling
- b. stratified sampling

- c. endogenous sampling
- d. exogenous sampling

ANSWER: b

RATIONALE: FEEDBACK: The method of data collection in which the population is divided into nonoverlapping, exhaustive groups is called stratified sampling.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Missing Data, Nonrandom Samples, and Outlying Observations

KEYWORDS: Bloom's: Knowledge

17. Which of the following types of sampling always causes bias or inconsistency in the ordinary least squares estimators?

- a. Random sampling
- b. Exogenous sampling
- c. Endogenous sampling
- d. Stratified sampling

ANSWER: c

RATIONALE: FEEDBACK: Endogenous sampling always causes bias in the OLS estimators. If the sample is based on whether the dependent variable is above or below a given value, bias always occurs in OLS in estimating the population model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Missing Data, Nonrandom Samples, and Outlying Observations

KEYWORDS: Bloom's: Knowledge

18. Which of the following is a difference between least absolute deviations (LAD) and ordinary least squares (OLS) estimation?

- a. OLS is more computationally intensive than LAD.
- b. OLS is more sensitive to outlying observations than LAD.
- c. OLS is justified for very large sample sizes while LAD is justified for smaller sample sizes.
- d. OLS is designed to estimate the conditional median of the dependent variable while LAD is designed to estimate the conditional mean.

ANSWER: b

RATIONALE: FEEDBACK: OLS is more sensitive to outlying observations than LAD.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Least Absolute Deviations Estimation

KEYWORDS: Bloom's: Knowledge

19. An explanatory variable is called exogenous if it is correlated with the error term.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: An explanatory variable is called endogenous if it is correlated with the error term.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
KEYWORDS: Bloom's: Knowledge

20. A multiple regression model suffers from functional form misspecification when it does not properly account for the relationship between the dependent and the observed explanatory variables.

- a. True
- b. False

ANSWER: True
RATIONALE: **FEEDBACK:** A multiple regression model suffers from functional form misspecification when it does not properly account for the relationship between the dependent and the observed explanatory variables.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Functional Form Misspecification
KEYWORDS: Bloom's: Knowledge

21. One of the assumptions for the plug-in solution to provide consistent estimators of β_1 and β_2 is that the error u is uncorrelated with all the independent variables.

- a. True
- b. False

ANSWER: True
RATIONALE: **FEEDBACK:** One of the assumptions for the plug-in solution to provide consistent estimators of β_1 and β_2 is that the error u is uncorrelated with all the independent variables.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Using Proxy Variables for Unobserved Explanatory Variables
KEYWORDS: Bloom's: Knowledge

22. The measurement error is the difference between the actual value of a variable and its reported value.

- a. True
- b. False

ANSWER: True
RATIONALE: **FEEDBACK:** The measurement error is the difference between the actual value of a variable and its reported value.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Properties of OLS under Measurement Error
KEYWORDS: Bloom's: Knowledge

23. Studentized residuals are obtained from the original OLS residuals by dividing them by an estimate of their standard deviation.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: Studentized residuals are obtained from the original OLS residuals by dividing them by an estimate of their standard deviation.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Missing Data, Nonrandom Samples, and Outlying Observations

KEYWORDS: Bloom's: Knowledge

24. If the data are missing at random, then the missing data do not cause any statistical problems.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: If the data are missing at random, then the missing data do not cause any statistical problems. The MCAR assumption implies that the reason the data are missing is independent of both the observed and unobserved factors affecting y .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Missing Data, Nonrandom Samples, and Outlying Observations

KEYWORDS: Bloom's: Knowledge

25. The Least Absolute Deviations (LAD) estimators in a linear model minimize the sum of squared residuals.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: The Least Absolute Deviations (LAD) estimators in a linear model minimize the sum of the absolute values of the residuals.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Least Absolute Deviations Estimation

KEYWORDS: Bloom's: Knowledge

1. Which of the following correctly identifies a difference between cross-sectional data and time series data?
- Cross-sectional data is based on temporal ordering, whereas time series data is not.
 - Time series data is based on temporal ordering, whereas cross-sectional data is not.
 - Cross-sectional data consists of only qualitative variables, whereas time series data consists of only quantitative variables.
 - Time series data consists of only qualitative variables, whereas cross-sectional data does not include qualitative variables.

ANSWER: b

RATIONALE: FEEDBACK: Time series data is based on temporal ordering, whereas cross sectional data is not.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Nature of Time Series Data

KEYWORDS: Bloom's: Knowledge

2. A stochastic process refers to a:
- sequence of random variables indexed by time.
 - sequence of variables that can take fixed qualitative values.
 - sequence of random variables that can take binary values only.
 - sequence of random variables estimated at the same point of time.

ANSWER: a

RATIONALE: FEEDBACK: A stochastic process refers to a sequence of random variables indexed by time.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Nature of Time Series Data

KEYWORDS: Bloom's: Knowledge

3. The sample size for a time series data set is the number of:
- variables being measured.
 - time periods over which we observe the variables of interest less the number of variables being measured.
 - time periods over which we observe the variables of interest plus the number of variables being measured.
 - time periods over which we observe the variables of interest.

ANSWER: d

RATIONALE: FEEDBACK: The sample size for a time series data set is the number of time periods over which we observe the variables of interest.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Nature of Time Series Data

KEYWORDS: Bloom's: Knowledge

4. The model: $Y_t = \beta_0 + \beta_1 c_t + u_t$, $t = 1, 2, \dots, n$ is an example of a(n):
- autoregressive conditional heteroskedasticity model.
 - static model.

- c. finite distributed lag model.
- d. infinite distributed lag model.

ANSWER: b

RATIONALE: FEEDBACK: The model: $y_t = \beta_0 + \beta_1 c_t + u_t$, $t = 1, 2, \dots, n$ is an example of a static model.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Examples of Time Series Regression Models

KEYWORDS: Bloom's: Comprehension

5. A static model is postulated when:

- a. a change in the independent variable at time ' t ' is believed to have an effect on the dependent variable at period ' $t + 1$ '.
- b. a change in the independent variable at time ' t ' is believed to have an effect on the dependent variable for all successive time periods.
- c. a change in the independent variable at time ' t ' does not have any effect on the dependent variable.
- d. a change in the independent variable at time ' t ' is believed to have an immediate effect on the dependent variable.

ANSWER: d

RATIONALE: FEEDBACK: A static model is postulated when a change in the independent variable at time ' t ' is believed to have an immediate effect on the dependent variable.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Examples of Time Series Regression Models

KEYWORDS: Bloom's: Knowledge

6. Refer to the following model

$$y_t = \alpha_0 + \beta_0 s_t + \beta_1 s_{t-1} + \beta_2 s_{t-2} + \beta_3 s_{t-3} + u_t$$

This is an example of a(n):

- a. infinite distributed lag model.
- b. finite distributed lag model of order 1.
- c. finite distributed lag model of order 2.
- d. finite distributed lag model of order 3.

ANSWER: d

RATIONALE: FEEDBACK: The model: $y_t = \alpha_0 + \beta_0 s_t + \beta_1 s_{t-1} + \beta_2 s_{t-2} + \beta_3 s_{t-3} + u_t$, is an example of a finite distributed lag model of order 3.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Examples of Time Series Regression Models

KEYWORDS: Bloom's: Comprehension

7. Refer to the following model.

$$y_t = \alpha_0 + \beta_0 s_t + \beta_1 s_{t-1} + \beta_2 s_{t-2} + \beta_3 s_{t-3} + u_t$$

$\beta_0 + \beta_1 + \beta_2 + \beta_3$ represents:

- a. the short-run change in y given a temporary increase in s .
- b. the short-run change in y given a permanent increase in s .
- c. the long-run change in y given a permanent increase in s .
- d. the long-run change in y given a temporary increase in s .

ANSWER: c

RATIONALE: FEEDBACK: In the model, the sum of the coefficients on current and lagged z , $\beta_0 + \beta_1 + \beta_2 + \beta_3$ represents the long-run change in y given a permanent change in s .

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Examples of Time Series Regression Models

KEYWORDS: Bloom's: Comprehension

8. Which of the following is an assumption on which time series regression is based?

- a. A time series process follows a model that is nonlinear in parameters.
- b. In a time series process, no independent variable is a perfect linear combination of the others.
- c. In a time series process, at least one independent variable is a constant.
- d. For each time period, the expected value of the error u_t , given the explanatory variables for all time periods, is positive.

ANSWER: b

RATIONALE: FEEDBACK: Time series regression is based on the assumption that no independent variable is constant nor a perfect linear combination of the others.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Finite Sample Properties of OLS under Classical Assumptions

KEYWORDS: Bloom's: Knowledge

9. Under the assumptions of time series regression, which of the following statements will be true of the following model:

$$y_t = \beta_0 + \beta_1 d_t + u_t$$

- a. d can have a lagged effect on y .
- b. u_t can be correlated with past and future values of d .
- c. Changes in the error term cannot cause future changes in d .
- d. Changes in d cannot cause changes in y at the same point of time.

ANSWER: c

RATIONALE: FEEDBACK: Under the assumptions of time series regression, changes in the error term cannot cause future changes in d , in the given model.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Finite Sample Properties of OLS under Classical Assumptions

KEYWORDS: Bloom's: Knowledge

10. Which of the following rules out perfect collinearity among the regressors?

- a. Multiple regression
- b. Simple regression
- c. Time series regression
- d. Cross-sectional regression

ANSWER: d

RATIONALE: FEEDBACK: Cross-sectional regression rules out perfect collinearity among the regressors.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Finite Sample Properties of OLS under Classical Assumptions

KEYWORDS: Bloom's: Knowledge

11. If an explanatory variable is strictly exogenous it implies that:

- a. changes in the lag of the variable does not affect future values of the dependent variable.
- b. the variable is correlated with the error term in all future time periods.
- c. the variable cannot react to what has happened to the dependent variable in the past.
- d. the conditional mean of the error term given the variable is zero.

ANSWER: c

RATIONALE: FEEDBACK: If an explanatory variable is strictly exogenous it implies that the variable cannot react to what has happened to the dependent variable in the past.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Finite Sample Properties of OLS under Classical Assumptions

KEYWORDS: Bloom's: Knowledge

12. A study which observes whether a particular occurrence influences some outcome is referred to as a(n):

- a. event study.
- b. exponential study.
- c. laboratory study.
- d. comparative study.

ANSWER: a

RATIONALE: FEEDBACK: A study which observes whether a particular occurrence influences some outcome is referred to as an event study.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Functional Form, Dummy Variables, and Index Numbers.

KEYWORDS: Bloom's: Knowledge

13. With base year 1990, the index of industrial production for the year 1999 is 112. What will be the value of the index in 1999, if the base year is changed to 1982 and the index measured 96 in 1982?

- a. 112.24
- b. 116.66
- c. 85.71

d. 92.09

ANSWER: b
RATIONALE: FEEDBACK: If the base year is changed to 1982, the new index of industrial production for 1999 will equal $100(112/96) = 116.67$.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic
TOPICS: Functional Form, Dummy Variables, and Index Numbers.
KEYWORDS: Bloom's: Apply

14. The propensity $\delta_0 + \delta_1 + \dots + \delta_k$ is sometimes called the:

- a. short-run elasticity, which measures the percentage increase in a dependent variable after k quarters given a permanent 1% increase in the k independent variables.
- b. long-run elasticity, which measures the percentage increase in a dependent variable after k quarters given a permanent 1% increase in the k independent variables.
- c. short-run elasticity, which measures the percentage decrease in a dependent variable after k quarters given a permanent 1% decrease in the k independent variables.
- d. long-run elasticity, which measures the percentage decrease in a dependent variable after k quarters given a permanent 1% decrease in the k independent variables.

ANSWER: b
RATIONALE: FEEDBACK: The propensity $\delta_0 + \delta_1 + \dots + \delta_k$ is sometimes called the long-run elasticity, which measures the percentage increase in a dependent variable after k quarters given a permanent 1% increase in the k independent variables.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Functional Form, Dummy Variables, and Index Numbers
KEYWORDS: Bloom's: Knowledge

15. Which of the following statements is true?

- a. The average of an exponential time series is a linear function of time.
- b. The average of a linear sequence is an exponential function of time.
- c. When a series has the same average growth rate from period to period, it can be approximated with an exponential trend.
- d. When a series has the same average growth rate from period to period, it can be approximated with a linear trend.

ANSWER: c
RATIONALE: FEEDBACK: When a series has the same average growth rate from period to period, it can be approximated with an exponential trend.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Trends and Seasonality
KEYWORDS: Bloom's: Knowledge

16. Adding a time trend can make an explanatory variable more significant if:

- a. the dependent and independent variables have similar kinds of trends, but movement in the independent variable about its trend line causes movement in the dependent variable away from its trend line.
- b. the dependent and independent variables have similar kinds of trends and movement in the independent variable about its trend line causes movement in the dependent variable towards its trend line.
- c. the dependent and independent variables have different kinds of trends and movement in the independent variable about its trend line causes movement in the dependent variable towards its trend line.
- d. the dependent and independent variables have different kinds of trends, but movement in the independent variable about its trend line causes movement in the dependent variable away from its trend line.

ANSWER: d

RATIONALE: FEEDBACK: Adding a time trend can make an explanatory variable more significant if the dependent and independent variables have different kinds of trends and movement in the independent variable about its trend line causes movement in the dependent variable away from its trend line.

POINTS: 1

DIFFICULTY: Challenging

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Trends and Seasonality

KEYWORDS: Bloom's: Knowledge

17. A seasonally adjusted series is one which:

- a. has had seasonal factors added to it.
- b. has seasonal factors removed from it.
- c. has qualitative dependent variables representing different seasons.
- d. has qualitative explanatory variables representing different seasons.

ANSWER: b

RATIONALE: FEEDBACK: A seasonally adjusted series is one which has seasonal factors removed from it.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Trends and Seasonality

KEYWORDS: Bloom's: Knowledge

18. If $\alpha_1 > 0$, then y_t in the linear function of time $E(y_t) = \alpha_0 + \alpha_1 t$ displays a(n):

- a. upward trend.
- b. downward trend.
- c. exponential trend.
- d. quadratic trend.

ANSWER: a

RATIONALE: FEEDBACK: If $\alpha_1 > 0$, then y_t in the linear function of time $E(y_t) = \alpha_0 + \alpha_1 t$ displays an upward trend.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Trends and Seasonality

KEYWORDS: Bloom's: Knowledge

19. Economic time series are outcomes of random variables.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: Economic time series are outcomes of random variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Nature of Time Series Data

KEYWORDS: Bloom's: Knowledge

20. In a static model, one or more explanatory variables affect the dependent variable with a lag.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: In a finite distributed lag model, one or more explanatory variables affect the dependent variable with a lag. In a static model, no lags are included.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Examples of Time Series Regression Models

KEYWORDS: Bloom's: Knowledge

21. Time series regression is based on series which exhibit serial correlation.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: One of the assumptions of time series regression is that there should be no serial correlation in the concerned series.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Finite Sample Properties of OLS under Classical Assumptions

KEYWORDS: Bloom's: Knowledge

22. Price indexes are necessary for turning a time series measured in real value into nominal value.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: Price indexes are necessary for turning a time series measured in nominal value into real value.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Functional Forms, Dummy Variables, and Index Numbers.

KEYWORDS: Bloom's: Knowledge

23. The short-run elasticity measures the immediate percentage change in a dependent variable given a 1% increase in the independent variables.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The short-run elasticity measures the immediate percentage change in a dependent variable given a 1% increase in the independent variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Functional Form, Dummy Variables, and Index Numbers

KEYWORDS: Bloom's: Knowledge

24. Dummy variables can be used to address the problem of seasonality in regression models.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: Dummy variables can be used to account for seasonality in the dependent variable, the independent variables, or both and thus, address the problem of seasonality in regression models.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Trends and Seasonality

KEYWORDS: Bloom's: Knowledge

25. When a series has the same average growth rate from period to period, then it can be approximated by an exponential trend.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: When a series has the same average growth rate from period to period, then it can be approximated by an exponential trend.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Trends and Seasonality

KEYWORDS: Bloom's: Knowledge

1. A process is stationary if:

- any collection of random variables in a sequence is taken and shifted ahead by h time periods; the joint probability distribution changes.
- any collection of random variables in a sequence is taken and shifted ahead by h time periods, the joint probability distribution remains unchanged.
- there is serial correlation between the error terms of successive time periods and the explanatory variables and the error terms have positive covariance.
- there is no serial correlation between the error terms of successive time periods and the explanatory variables and the error terms have positive covariance.

ANSWER: b

RATIONALE: FEEDBACK: A process is stationary if any collection of random variables in a sequence is taken and shifted ahead by h time periods; the joint probability distribution remains unchanged.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Stationary and Weakly Dependent Time Series

KEYWORDS: Bloom's: Knowledge

2. Covariance stationary sequences where $\text{Corr}(x_t + x_{t+h}) \rightarrow 0$ as $h \rightarrow \infty$ are said to be:

- unit root processes.
- trend-stationary processes.
- serially uncorrelated.
- asymptotically uncorrelated.

ANSWER: d

RATIONALE: FEEDBACK: Covariance stationary sequences where $\text{Corr}(x_t + x_{t+h}) \rightarrow 0$ as $h \rightarrow \infty$ are said to be asymptotically uncorrelated.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Stationary and Weakly Dependent Time Series

KEYWORDS: Bloom's: Knowledge

3. A stochastic process $\{x_t: t = 1, 2, \dots\}$ with a finite second moment $[E(x_t^2) < \infty]$ is covariance stationary if:

- $E(x_t)$ is variable, $\text{Var}(x_t)$ is variable, and for any $t, h \geq 1$, $\text{Cov}(x_t, x_{t+h})$ depends only on ' h ' and not on ' t '.
- $E(x_t)$ is variable, $\text{Var}(x_t)$ is variable, and for any $t, h \geq 1$, $\text{Cov}(x_t, x_{t+h})$ depends only on ' t ' and not on h .
- $E(x_t)$ is constant, $\text{Var}(x_t)$ is constant, and for any $t, h \geq 1$, $\text{Cov}(x_t, x_{t+h})$ depends only on ' h ' and not on ' t '.
- $E(x_t)$ is constant, $\text{Var}(x_t)$ is constant, and for any $t, h \geq 1$, $\text{Cov}(x_t, x_{t+h})$ depends only on ' t ' and not on ' h '.

ANSWER: c

RATIONALE: FEEDBACK: A stochastic process $\{x_t: t = 1, 2, \dots\}$ with a finite second moment $[E(x_t^2) < \infty]$ is covariance stationary if $E(x_t)$ is constant, $\text{Var}(x_t)$ is constant, and for any $t, h \geq 1$, $\text{Cov}(x_t, x_{t+h})$ depends only on ' h ' and not on ' t '.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

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TOPICS: Stationary and Weakly Dependent Time Series

KEYWORDS: Bloom's: Knowledge

4. A covariance stationary time series is weakly dependent if:

- the correlation between the independent variable at time ' t ' and the dependent variable at time ' $t + h$ ' goes to ∞ as $h \rightarrow 0$.
- the correlation between the independent variable at time ' t ' and the dependent variable at time ' $t + h$ ' goes to 0 as $h \rightarrow \infty$.
- the correlation between the independent variable at time ' t ' and the independent variable at time ' $t + h$ ' goes to 0 as $h \rightarrow \infty$.
- the correlation between the independent variable at time ' t ' and the independent variable at time ' $t + h$ ' goes to ∞ as $h \rightarrow \infty$.

ANSWER: c

RATIONALE: FEEDBACK: A covariance stationary time series is weakly dependent if the correlation between the independent variable at time ' t ' and the independent variable at time ' $t + h$ ' goes to 0 as $h \rightarrow \infty$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Stationary and Weakly Dependent Time Series

KEYWORDS: Bloom's: Knowledge

5. The model $y_t = e_t + \alpha_1 e_{t-1} + \alpha_2 e_{t-2}$, $t = 1, 2, \dots$, where e_t is an i.i.d. sequence with zero mean and variance σ_e^2 represents a(n):

- static model.
- moving average process of order one.
- moving average process of order two.
- autoregressive process of order two.

ANSWER: c

RATIONALE: FEEDBACK: The model $y_t = e_t + \alpha_1 e_{t-1} + \alpha_2 e_{t-2}$, $t = 1, 2, \dots$, where e_t is an i.i.d. sequence with zero mean and variance σ_e^2 , represents an moving average process of order two.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Stationary and Weakly Dependent Time Series

KEYWORDS: Bloom's: Knowledge

6. The model $x_t = \alpha_1 x_{t-1} + e_t$, $t = 1, 2, \dots$, where e_t is an i.i.d. sequence with zero mean and variance σ_e^2 represents a(n):

- moving average process of order one.
- moving average process of order two.
- autoregressive process of order one.
- autoregressive process of order two.

ANSWER: c

RATIONALE: FEEDBACK: The model $x_t = \alpha_1 x_{t-1} + e_t$, $t = 1, 2, \dots$, where e_t is an i.i.d. sequence with zero

mean and variance σ_e^2 , represents an autoregressive process of order one.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Stationary and Weakly Dependent Time Series

KEYWORDS:

Bloom's: Knowledge

7. Which of the following is assumed in time series regression?

- a. There is no perfect collinearity between the explanatory variables.
- b. The explanatory variables are contemporaneously endogenous.
- c. The error terms are contemporaneously heteroskedastic.
- d. The explanatory variables cannot have temporal ordering.

ANSWER:

a

RATIONALE:

FEEDBACK: One of the assumptions of time series regression is that there should be no perfect collinearity between the explanatory variables.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Asymptotic Properties of OLS

KEYWORDS:

Bloom's: Knowledge

8. Suppose u_t is the error term for time period 't' in a time series regression model the explanatory variables are $x_t = (x_{t1}, x_{t2}, \dots, x_{tk})$. The assumption that the errors are contemporaneously homoskedastic implies that:

- a. $\text{Var}(u_t|\mathbf{x}_t) = \sqrt{\sigma}$.
- b. $\text{Var}(u_t|\mathbf{x}_t) = \infty$.
- c. $\text{Var}(u_t|\mathbf{x}_t) = \sigma^2$.
- d. $\text{Var}(u_t|\mathbf{x}_t) = \sigma$.

ANSWER:

c

RATIONALE:

FEEDBACK: If u_t is the error term for time period 't' and \mathbf{x}_t is a matrix consisting of all independent variables for time 't', the assumption of contemporaneously homoskedasticity implies that $\text{Var}(u_t|\mathbf{x}_t) = \sigma^2$.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Asymptotic Properties of OLS

KEYWORDS:

Bloom's: Knowledge

9. Which of the following statements is true?

- a. A model with a lagged dependent variable cannot satisfy the strict exogeneity assumption.
- b. Stationarity is critical for OLS to have its standard asymptotic properties.
- c. Efficient static models can be estimated for nonstationary time series.
- d. In an autoregressive model, the dependent variable in the current time period varies with the error term of previous time periods.

ANSWER:

a

RATIONALE: FEEDBACK: A model with a lagged dependent variable cannot satisfy the strict exogeneity assumption. When explanatory variables are correlated with the past, strict exogeneity does not hold.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Asymptotic Properties of OLS

KEYWORDS: Bloom's: Knowledge

10. Consider the model: $y_t = \beta_0 + \beta_1 z_{t1} + \beta_2 z_{t2} + u_t$. Under weak dependence, the condition sufficient for consistency of OLS is:

- a. $E(z_{t1}|z_{t2}) = 0$.
- b. $E(y_t | z_{t1}, z_{t2}) = 0$.
- c. $E(u_t | z_{t1}, z_{t2}) = 0$.
- d. $E(u_t | z_{t1}, z_{t2}) = \infty$.

ANSWER: c

RATIONALE: FEEDBACK: If a time series model is weakly dependent, the condition sufficient for consistency of OLS is $E(u_t | z_{t1}, z_{t2}) = 0$.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Asymptotic Properties of OLS

KEYWORDS: Bloom's: Knowledge

11. The model $y_t = y_{t-1} + e_t$, $t = 1, 2, \dots$ represents a:

- a. AR(2) process.
- b. MA(1) process.
- c. random walk process.
- d. random walk with a drift process.

ANSWER: c

RATIONALE: FEEDBACK: The model $y_t = y_{t-1} + e_t$, $t = 1, 2, \dots$ represents a random walk process.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Using Highly Persistent Time Series in Regression Analysis

KEYWORDS: Bloom's: Knowledge

12. Which of the following statements is true?

- a. A random walk process is stationary.
- b. The variance of a random walk process increases as a linear function of time.
- c. Adding a drift term to a random walk process makes it stationary.
- d. The variance of a random walk process with a drift decreases as an exponential function of time.

ANSWER: b

RATIONALE: FEEDBACK: The variance of a random walk process increases as a linear function of time.

This is because the variance of the dependent variable is equal to $\sigma^2 t$.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Using Highly Persistent Time Series in Regression Analysis

KEYWORDS:

Bloom's: Knowledge

13. If a process is said to be integrated of order one, or $I(1)$, ____.

- a. it is stationary at level
- b. averages of such processes already satisfy the standard limit theorems
- c. the first difference of the process is weakly dependent
- d. it does not have a unit root

ANSWER:

c

RATIONALE:

FEEDBACK: If a process is said to be integrated of order one, or $I(1)$, the first difference of the process is weakly dependent.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Using Highly Persistent Time Series in Regression Analysis

KEYWORDS:

Bloom's: Knowledge

14. Unit root processes, such as a random walk (with or without drift), are said to be:

- a. integrated of order one.
- b. integrated of order two.
- c. sequentially exogenous.
- d. asymptotically uncorrelated.

ANSWER:

a

RATIONALE:

FEEDBACK: Unit root processes, such as a random walk (with or without drift), are said to be integrated of order one.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Using Highly Persistent Time Series in Regression Analysis

KEYWORDS:

Bloom's: Knowledge

15. Which of the following statements is true of dynamically complete models?

- a. There is scope of adding more lags to the model to better forecast the dependent variable.
- b. The problem of serial correlation does not exist in dynamically complete models.
- c. All econometric models are dynamically complete.
- d. Sequential endogeneity is implied by dynamic completeness..

ANSWER:

b

RATIONALE:

FEEDBACK: The problem of serial correlation does not exist in dynamically complete models.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Dynamically Complete Models and the Absence of Serial Correlation

KEYWORDS: Bloom's: Knowledge

16. In the model $y_t = \beta_0 + \beta_1 x_{t1} + \beta_2 x_{t2} + \dots + \beta_k x_{tk} + u_t$, the explanatory variables, $x_t = (x_{t1}, x_{t2}, \dots, x_{tk})$, are sequentially exogenous if:

- a. $E(u_t | \mathbf{x}_t, \mathbf{x}_{t-1}, \dots) = E(u_t) = 0, t = 1, 2, \dots$
- b. $E(u_t | \mathbf{x}_t, \mathbf{x}_{t-1}, \dots) \neq E(u_t) = 0, t = 1, 2, \dots$
- c. $E(u_t | \mathbf{x}_t, \mathbf{x}_{t-1}, \dots) = E(u_t) > 0, t = 1, 2, \dots$
- d. $E(u_t | \mathbf{x}_t, \mathbf{x}_{t-1}, \dots) = E(u_t) = 1, t = 1, 2, \dots$

ANSWER: a

RATIONALE: FEEDBACK: In the given model, the explanatory variables are sequentially exogenous if $E(u_t | \mathbf{x}_t, \mathbf{x}_{t-1}, \dots) = E(u_t) = 0, t = 1, 2, \dots$

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Dynamically Complete Models and the Absence of Serial Correlation

KEYWORDS: Bloom's: knowledge

17. Which of the following is a strong assumption for static and finite distributed lag models?

- a. Sequential exogeneity
- b. Strict exogeneity
- c. Dynamic completeness
- d. Homoskedasticity

ANSWER: c

RATIONALE: FEEDBACK: Dynamic completeness is a strong assumption for static and finite distributed lag models.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Dynamically Complete Models and the Absence of Serial Correlation

KEYWORDS: Bloom's: Comprehension

18. If u_t refers to the error term at time ' t ' and y_{t-1} refers to the dependent variable at time ' $t-1$ ', for an AR(1) process to be homoskedastic, it is required that:

- a. $\text{Var}(u_t | y_{t-1}) > \text{Var}(y_t | y_{t-1}) = \sigma^2$.
- b. $\text{Var}(u_t | y_{t-1}) = \text{Var}(y_t | y_{t-1}) > \sigma^2$.
- c. $\text{Var}(u_t | y_{t-1}) < \text{Var}(y_t | y_{t-1}) = \sigma^2$.
- d. $\text{Var}(u_t | y_{t-1}) = \text{Var}(y_t | y_{t-1}) = \sigma^2$.

ANSWER: d

RATIONALE: FEEDBACK: If u_t refers to the error term at time ' t ' and y_{t-1} refers to the dependent variable at time ' $t-1$ ', for an AR(1) model to be homoskedastic, it is required that $\text{Var}(u_t | y_{t-1}) = \text{Var}(y_t | y_{t-1}) = \sigma^2$.

POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Homoskedasticity Assumption for Time Series Models
KEYWORDS: Bloom's: Knowledge

19. Covariance stationarity focuses only on the first two moments of a stochastic process.

- a. True
- b. False

ANSWER: True
RATIONALE: **FEEDBACK:** Covariance stationarity focuses only on the first two moments of a stochastic process: the mean and variance, which are constant over time.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Stationary and Weakly Dependent Time Series
KEYWORDS: Bloom's: Knowledge

20. Weakly dependent processes are said to be integrated of order zero.

- a. True
- b. False

ANSWER: True
RATIONALE: **FEEDBACK:** Weakly dependent processes are said to be integrated of order zero, or $I(0)$.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Stationary and Weakly Dependent Time Series
KEYWORDS: Bloom's: Knowledge

21. If a process is a covariance stationary process, then it will have a finite second moment.

- a. True
- b. False

ANSWER: False
RATIONALE: **FEEDBACK:** If a stationary process has a finite second moment, then it must be covariance stationary, but the converse is certainly not true.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Stationary and Weakly Dependent Time Series
KEYWORDS: Bloom's: Knowledge

22. Under adaptive expectations, the expected current value of a variable does not depend on a recently observed value of the variable.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: Under adaptive expectations, the expected current value of a variable adapts to a recently observed value of the variable.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Asymptotic Properties of OLS
KEYWORDS: Bloom's: Knowledge

23. The variance of a random walk process decreases as a linear function of time.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: The variance of a random walk process increases as a linear function of time.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Using Highly Persistent Time Series in Regression Analysis
KEYWORDS: Bloom's: Comprehension

24. Sequential exogeneity is implied by dynamic completeness.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: Sequential exogeneity is implied by dynamic completeness.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Dynamically Complete Models and the Absence of Serial Correlation
KEYWORDS: Bloom's: Knowledge

25. The homoskedasticity assumption in time series regression suggests that the variance of the error term cannot be a function of time.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: The homoskedasticity assumption in time series regression suggests that the variance of the error term cannot be a function of time. Homoskedasticity implies that the variance of the error term is constant and hence cannot be a function of time.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Homoskedasticity Assumption for Time Series Models
KEYWORDS: Bloom's: Knowledge

1. In the presence of serial correlation:

- a. estimated standard errors remain valid.
- b. estimated test statistics remain valid.
- c. estimated OLS values are not BLUE.
- d. estimated variance does not differ from the case of no serial correlation.

ANSWER: c

RATIONALE: FEEDBACK: As the Gauss-Markov Theorem requires both homoscedasticity and serially uncorrelated errors, OLS is no longer BLUE in the presence of serial correlation.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Properties of OLS with Serially Correlated Errors

KEYWORDS: Bloom's: Knowledge

2. When a series is stationary, weakly dependent, and has serial correlation:

- a. the adjusted R^2 is inconsistent, while R^2 is a consistent estimator of the population parameter.
- b. the adjusted R^2 is consistent, while R^2 is an inconsistent estimator of the population parameter.
- c. both the adjusted R^2 and R^2 are inconsistent estimators of the population parameter.
- d. both the adjusted R^2 and R^2 are consistent estimators of the population parameter.

ANSWER: d

RATIONALE: FEEDBACK: When a series is stationary, weakly dependent, and has serial correlation both the adjusted R^2 and R^2 are consistent estimators of the population parameter as the calculation of R^2 and adjusted R^2 is based on the variance of the dependent variable and the error term, which do not change over time.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Properties of OLS with Serially Correlated Errors

KEYWORDS: Bloom's: Knowledge

3. A smaller standard error means:

- a. a larger t statistic.
- b. a smaller t statistic.
- c. a larger F statistic.
- d. a smaller F statistic.

ANSWER: a

RATIONALE: FEEDBACK: A smaller standard error means a larger t statistic.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Properties of OLS with Serially Correlated Errors

KEYWORDS: Bloom's: Knowledge

4. Which of the following is a test for serial correlation in the error terms?

- a. Johansen test

- b. Dickey Fuller test
- c. Durbin Watson test
- d. White test

ANSWER: c

RATIONALE: FEEDBACK: The Durbin Watson test can be used to test for serial correlation in error terms.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Serial Correlation

KEYWORDS: Bloom's: Knowledge

5. For a given significance level, if the calculated value of the Durbin Watson statistic lies between the lower critical value and the upper critical value, ____.

- a. the hypothesis of no serial correlation is accepted
- b. the hypothesis of no serial correlation is rejected
- c. the test is inconclusive
- d. the hypothesis of heteroskedasticity is accepted

ANSWER: c

RATIONALE: FEEDBACK: For a given significance level, if the calculated value of the Durbin Watson statistic lies between the lower critical value and upper critical value, the test is inconclusive.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Serial Correlation

KEYWORDS: Bloom's: Knowledge

6. Which of the following statements is true?

- a. When explanatory variables are not strictly exogenous, the t test for serial correlation is valid.
- b. When explanatory variables are not strictly exogenous, the Durbin Watson test for serial correlation is valid.
- c. Breusch-Godfrey test can be used to check for second order serial correlation.
- d. White test can be used to check for second order serial correlation.

ANSWER: c

RATIONALE: FEEDBACK: Breusch-Godfrey test can be used to check for second order serial correlation.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Serial Correlation

KEYWORDS: Bloom's: Knowledge

7. The Breusch-Godfrey test statistic follows a:

- a. χ^2 distribution.
- b. t distribution.
- c. normal distribution.
- d. F distribution.

ANSWER: a

RATIONALE: FEEDBACK: The Breusch-Godfrey test statistic follows a χ^2 distribution.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Testing for Serial Correlation
KEYWORDS: Bloom's: Knowledge

8. In a model based on a weakly dependent time series with serial correlation and strictly exogenous explanatory variables, _____.

- a. the feasible generalized least square estimates are unbiased
- b. the feasible generalized least square estimates are BLUE
- c. the feasible generalized least square estimates are asymptotically more efficient than OLS estimates
- d. the feasible generalized least square estimates are asymptotically less efficient than OLS estimates

ANSWER: c
RATIONALE: FEEDBACK: In a model based on a weakly dependent time series with serial correlation and strictly exogenous explanatory variables the feasible generalized least square estimates are asymptotically more efficient than OLS estimates.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Correcting for Serial Correlation with Strictly Exogenous Regressors
KEYWORDS: Bloom's: Knowledge

9. Which of the following is an example of FGLS estimation?

- a. Dickey-Fuller estimation
- b. Vector error correction estimation
- c. Prais-Winsten estimation
- d. OLS estimation.

ANSWER: c
RATIONALE: FEEDBACK: Prais-Winsten estimation is a type of FGLS estimation.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Correcting for Serial Correlation with Strictly Exogenous Regressors
KEYWORDS: Bloom's: Knowledge

10. Which of the following is the reason why standard errors measured by OLS differ from standard errors measured through Prais-Winsten transformation?

- a. OLS standard errors account for serial correlation, whereas Prais-Winsten estimations do not.
- b. Prais-Winsten standard errors account for serial correlation, whereas OLS estimations do not.
- c. Prais-Winsten standard errors account for heteroskedasticity, whereas OLS estimations do not.
- d. OLS standard errors account for heteroskedasticity, whereas Prais-Winsten estimations do not.

ANSWER: b
RATIONALE: FEEDBACK: The standard errors measured by OLS differ from the standard errors measured by Prais-Winsten transformation because Prais-Winsten standard errors account for serial correlation, whereas OLS estimations do not.

POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Correcting for Serial Correlation with Strictly Exogenous Regressors
KEYWORDS: Bloom's: Knowledge

11. Consistency of FGLS requires:

- a. u_t to be uncorrelated with x_{t-1} , x_t , and x_{t+1} .
- b. u_t to be uncorrelated with x_t and x_{t+1} .
- c. u_t to be correlated with x_t and x_{t+1} .
- d. u_t to be correlated with x_{t-1} , x_t , and x_{t+1} .

ANSWER: a

RATIONALE: FEEDBACK: Consistency of FGLS requires u_t to be uncorrelated with x_{t-1} , x_t , and x_{t+1} .

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Correcting for Serial Correlation with Strictly Exogenous Regressors
KEYWORDS: Bloom's: Knowledge

12. Which of the following identifies an advantage of first differencing a time-series?

- a. First differencing eliminates most of the serial correlation.
- b. First differencing eliminates most of the heteroskedasticity.
- c. First differencing eliminates most of the multicollinearity.
- d. First differencing eliminates the possibility of spurious regression.

ANSWER: a

RATIONALE: FEEDBACK: First differencing of a time-series helps eliminate most of the serial correlation.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Differencing and Serial Correlation
KEYWORDS: Bloom's: Knowledge

13. Which of the following is a limitation of serial correlation-robust standard errors?

- a. The serial correlation-robust standard errors are smaller than OLS standard errors when there is serial correlation.
- b. The serial correlation-robust standard errors can be poorly behaved when there is substantial serial correlation and the sample size is small.
- c. The serial correlation-robust standard errors cannot be calculated for autoregressive processes of an order greater than one.
- d. The serial correlation-robust standard errors cannot be calculated after relaxing the assumption of homoskedasticity.

ANSWER: b

RATIONALE: FEEDBACK: The serial correlation-robust standard errors can be poorly behaved when there is substantial serial correlation and the sample size is small.

POINTS: 1

DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Serial Correlation-Robust Inference after OLS
KEYWORDS: Bloom's: Knowledge

14. Which of the following statements is true?

- a. Prais-Winsten and Cochrane-Orcutt transformations are consistent when explanatory variables are not strictly exogenous.
- b. The SC-robust standard errors cannot be estimated in models with lagged dependent variables.
- c. The SC-robust standard errors work better after quasi-differencing a time series that is expected to be serially correlated.
- d. Estimation of SC-robust standard errors is independent of the sample size.

ANSWER: c
RATIONALE: FEEDBACK: The SC-robust standard errors work better after quasi-differencing a time series that is expected to be serially correlated. Quasi-differencing helps limit serial correlation.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Serial Correlation-Robust Inference after OLS
KEYWORDS: Bloom's: Knowledge

15. In the time series literature, the serial correlation–robust standard errors are sometimes called:

- a. homoskedasticity and autocorrelation inconsistent standard errors.
- b. homoskedasticity and autocorrelation consistent standard errors.
- c. heteroskedasticity and autocorrelation inconsistent standard errors.
- d. heteroskedasticity and autocorrelation consistent standard errors.

ANSWER: d
RATIONALE: FEEDBACK: In the time series literature, the serial correlation–robust standard errors are sometimes called heteroskedasticity and autocorrelation consistent standard errors.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Serial Correlation-Robust Inference after OLS
KEYWORDS: Bloom's: Knowledge

16. In the presence of heteroskedasticity, the usual OLS estimates of:

- a. standard errors are valid, whereas the t statistics and F statistics are invalid.
- b. t statistics are valid, but the standard errors and F statistics are invalid.
- c. F statistics are valid, but the standard errors and t statistics are invalid.
- d. standard errors, t statistics, and F statistics are invalid.

ANSWER: d
RATIONALE: FEEDBACK: In the presence of heteroskedasticity, the usual OLS estimates of standard errors, t statistics, and F statistics are invalid.
POINTS: 1
DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Heteroskedasticity in Time Series Regression
KEYWORDS: Bloom's: Knowledge

17. Which of the following tests can be used to test for heteroskedasticity in a time series?

- a. Johansen test
- b. Dickey-Fuller test
- c. Breusch-Pagan test
- d. Durbin's alternative test

ANSWER: c

RATIONALE: FEEDBACK: The Breusch-Pagan test can be used to test for heteroskedasticity in a time series.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Heteroskedasticity in Time Series Regression
KEYWORDS: Bloom's: Knowledge

18. The equation $u_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + v_t$ is an autoregressive model in _____.

- a. u_t
- b. u_t^2
- c. v_t
- d. u_{t-1}

ANSWER: b

RATIONALE: FEEDBACK: The model $u_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + v_t$ is an autoregressive model in u_t^2 .

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Heteroskedasticity in Time Series Regression
KEYWORDS: Bloom's: Knowledge

19. In presence of serial correlation, the OLS variance formula accurately estimates the true variance of the OLS estimator.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: In presence of serial correlation, the OLS variance formula either understates or overstates the true variance of the OLS estimator.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Properties of OLS with Serially Correlated Errors
KEYWORDS: Bloom's: Knowledge

20. Durbin's alternative test is valid even if the explanatory variables are strictly exogenous.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: Durbin's alternative test is valid even if the explanatory variables are strictly exogenous.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Testing for Serial Correlation
KEYWORDS: Bloom's: Knowledge

21. Consistency of feasible generalized least square estimators requires the error term to be correlated with lags of the explanatory variable.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: Consistency of feasible generalized least square estimators requires the error term to be uncorrelated with lags of the explanatory variable. Correlation will lead to inconsistent estimates.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Testing for Serial Correlation
KEYWORDS: Bloom's: Knowledge

22. FGLS estimates are efficient when explanatory variables are not strictly exogenous.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: FGLS estimates are inefficient when explanatory variables are not strictly exogenous.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Testing for Serial Correlation
KEYWORDS: Bloom's: Knowledge

23. The Cochrane-Orcutt and Prais-Winsten methods are iterative methods of feasible generalized least square (FGLS) estimation.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: The Cochrane-Orcutt and Prais-Winsten methods are iterative methods of feasible generalized least square (FGLS) estimation.
POINTS: 1
DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Correcting for Serial Correlation with Strictly Exogenous Regressors

KEYWORDS: Bloom's: Knowledge

24. In time series regressions, it is advisable to check for serial correlation first, before checking for heteroskedasticity.

a. True

b. False

ANSWER: True

RATIONALE: FEEDBACK: Serial correlation invalidates heteroskedasticity tests. Hence, it is advisable to check for serial correlation first, before checking for heteroskedasticity in time series regressions.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Heteroskedasticity in Time Series Regression

KEYWORDS: Bloom's: Knowledge

25. The serial correlation–robust standard errors are typically larger than the usual OLS standard errors when there is serial correlation.

a. True

b. False

ANSWER: True

RATIONALE: FEEDBACK: The serial correlation–robust standard errors are typically larger than the usual OLS standard errors when there is serial correlation.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Serial Correlation-Robust Inference after OLS

KEYWORDS: Bloom's: Comprehension

1. Which of the following is a reason for using independently pooled cross sections?

- a. To obtain data on different cross sectional units
- b. To increase the sample size
- c. To select a sample based on the dependent variable
- d. To select a sample based on the independent variable

ANSWER: b

RATIONALE: FEEDBACK: One reason for using independently pooled cross sections is to increase the sample size. By pooling random samples drawn from the same population, but at different points in time, we can get more precise estimators and test statistics with more power.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Pooling Independent Cross Sections across Time

KEYWORDS: Bloom's: Knowledge

2. Pooling independent cross sections across time is useful in providing precise estimators if ____.

- a. the relationship between the dependent variable and at least some of the independent variables remains constant over time
- b. the relationship between the dependent variable and at least some of the independent variables is linear
- c. the relationship between the dependent variable and at least one of the independent variables changes over time
- d. the relationship between the dependent variable and at least one of the independent variables is positive

ANSWER: a

RATIONALE: FEEDBACK: Pooling independent cross sections across time is useful in providing precise estimators if the relationship between the dependent variable and at least some of the independent variables remains constant over time.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Pooling Independent Cross Sections across Time

KEYWORDS: Bloom's: Knowledge

3. A Chow test ____.

- a. is used to test the presence of heteroskedasticity in a regression model
- b. is used to determine how multiple regression differs across two groups
- c. cannot detect changes in the slope coefficients of dependent variables over time
- d. cannot be computed for more than two time periods

ANSWER: b

RATIONALE: FEEDBACK: A Chow test is used to determine how multiple regression differs across two groups.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Pooling Independent Cross Sections across Time

KEYWORDS: Bloom's: Knowledge

4. Which of the following is true of a natural experiment?

- a. A natural experiment occurs when some endogenous event changes the environment in which individuals, families, firms, or cities operate.
- b. The control group in a natural experiment is randomly chosen.
- c. The treatment group in a natural experiment is randomly chosen.
- d. Control and treatment groups in a natural experiment arise due to an exogenous event.

ANSWER: d

RATIONALE: **FEEDBACK:** Control and treatment groups in a natural experiment arise due to an exogenous event.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Policy Analysis with Pooled Cross Sections

KEYWORDS: Bloom's: Knowledge

5. The average treatment effect measures _____.

- a. the effect of a policy or program on the dependent variable
- b. the effect of unobserved factors on observed explanatory variables
- c. the effect of a change in an explanatory variable on other explanatory variables
- d. the effect of unobserved factors on the average outcome of the dependent variable

ANSWER: a

RATIONALE: **FEEDBACK:** The average treatment effect measures the effect of a policy or program on the dependent variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Policy Analysis with Pooled Cross Sections

KEYWORDS: Bloom's: Knowledge

6. The systematic differences between the control and treatment groups can be controlled by taking two years data, _____.

- a. one treatment group before policy change and one after the change
- b. one before the policy change and one after the change
- c. one control group and one treatment group
- d. one control group before policy change and one after the change

ANSWER: b

RATIONALE: **FEEDBACK:** The systematic differences between the control and treatment groups can be controlled by taking two years data, one before the policy change and one after the change.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Policy Analysis with Pooled Cross Sections

KEYWORDS: Bloom's: Knowledge

7. Idiosyncratic error is the error that occurs due to _____.

- a. incorrect measurement of an economic variable

- b. unobserved factors that affect the dependent variable and change over time
- c. unobserved factors that affect the dependent variable and do not change over time
- d. correlation between the independent variables

ANSWER: b

RATIONALE: **FEEDBACK:** Idiosyncratic error is the error that occurs due to unobserved factors that affect the dependent variable and change over time.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two-Period Panel Data Analysis

KEYWORDS: Bloom's: Knowledge

8. A regression model exhibits unobserved heterogeneity if ____.
- a. there are unobserved factors affecting the dependent variable that change over time
 - b. there are unobserved factors affecting the dependent variable that do not change over time
 - c. there are unobserved factors which are correlated with the observed independent variables
 - d. there are no unobserved factors affecting the dependent variable

ANSWER: b

RATIONALE: **FEEDBACK:** A regression model exhibits unobserved heterogeneity if there are unobserved factors affecting the dependent variable but they do not change over time.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two-Period Panel Data Analysis

KEYWORDS: Bloom's: Knowledge

9. Composite error is the error that occurs due to ____.
- a. the incorrect measurement of explanatory variables
 - b. the inclusion of too many explanatory variables in the model
 - c. correlation between the independent variables
 - d. unobserved factors affecting a dependent variable

ANSWER: d

RATIONALE: **FEEDBACK:** Composite error is the error that occurs due to all unobserved factors affecting a dependent variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two-Period Panel Data Analysis

KEYWORDS: Bloom's: Knowledge

10. Ordinary least squares estimation is subject to heterogeneity bias if ____.
- a. the regression model exhibits heteroskedasticity
 - b. the unobserved effect is correlated with the observed explanatory variables
 - c. the regression model includes a lagged dependent variable
 - d. the explanatory variables do not change over time

ANSWER: b

RATIONALE: FEEDBACK: Ordinary least estimation is subject to heterogeneity bias if the unobserved effect is correlated with the observed explanatory variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two-Period Panel Data Analysis

KEYWORDS: Bloom's: Knowledge

11. Which of the following assumptions is required to obtain a first-differenced estimator in a two-period panel data analysis?

- a. The explanatory variable does not change over time for any cross-sectional unit.
- b. The explanatory variable changes by the same amount in each time period.
- c. The variance of the error term in the regression model is not constant.
- d. The idiosyncratic error at each time period is uncorrelated with the explanatory variables in both time periods.

ANSWER: d

RATIONALE: FEEDBACK: The assumption that the idiosyncratic error at each time period is uncorrelated with the explanatory variables in both time periods is required to obtain a first-differenced estimator.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two-Period Panel Data Analysis

KEYWORDS: Bloom's: Knowledge

12. If each variable in a single cross-sectional equation is differenced over time, then it is called the:

- a. unobserved effects model.
- b. first-differenced estimator.
- c. fixed effects model.
- d. first-differenced equation.

ANSWER: d

RATIONALE: FEEDBACK: If each variable in a single cross-sectional equation is differenced over time, then it is called the first-differenced equation.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two-Period Panel Data Analysis

KEYWORDS: Bloom's: Knowledge

13. Which of the following is an advantage of panel data?

- a. We can difference the dependent variable, y , across time for different cross-sectional units.
- b. We can add the dependent variable, y , across time for different cross-sectional units.
- c. We can difference the dependent variable, y , across time for the same cross-sectional units.
- d. We can add the dependent variable, y , across time for the same cross-sectional units.

ANSWER: c

RATIONALE: FEEDBACK: An advantage of panel data is that we can difference the dependent variable, y , across time for the same cross-sectional units.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Policy Analysis with Two-Period Panel Data
KEYWORDS: Bloom's: Knowledge

14. The assumption of "strict exogeneity" in a regression model means that _____.
a. the dependent variable is binary
b. all explanatory variables change over time
c. the model does not include a lagged dependent variable as a regressor
d. the model includes all relevant explanatory variables

ANSWER: c
RATIONALE: **FEEDBACK:** The assumption of "strict exogeneity" in a regression model means that the model does not include a lagged dependent variable as a regressor.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Differencing with More Than Two Time Periods
KEYWORDS: Bloom's: Knowledge

15. A data set is a balanced panel if it _____.
a. consists of a sample of individuals, households, firms, cities, states, countries, or a variety of other units, taken at a given point in time
b. consists of observations on a variable or several variables over time
c. consists of data for each cross sectional units over the same time period
d. consists of time-demeaned data for different cross sectional units

ANSWER: c
RATIONALE: **FEEDBACK:** A data set is a balanced panel if it consists of data for different cross sectional units over the same time period.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Differencing with More Than Two Time Periods
KEYWORDS: Bloom's: Knowledge

16. Which of the following assumptions is needed for the usual standard errors to be valid when differencing with more than two time periods?
a. The regression model exhibits heteroskedasticity.
b. The differenced idiosyncratic error or Δu_{it} is uncorrelated over time.
c. The unobserved factors affecting the dependent variable are time-constant.
d. The regression model includes a lagged independent variable.

ANSWER: b
RATIONALE: **FEEDBACK:** The differenced idiosyncratic error is uncorrelated over time.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Differencing with More Than Two Time Periods

KEYWORDS: Bloom's: Knowledge

17. First-differenced estimation in a panel data analysis is subject to serious biases if _____.
a. key explanatory variables vary significantly over time
b. the explanatory variables do not change by the same unit in each time period
c. one or more of the explanatory variables are measured incorrectly
d. the regression model exhibits homoscedasticity

ANSWER: c

RATIONALE: **FEEDBACK:** First-differenced estimation is subject to serious biases if one or more of the explanatory variables are measured incorrectly.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Differencing with More Than Two Time Periods

KEYWORDS: Bloom's: Knowledge

18. The general approach to obtaining fully robust standard errors and test statistics in the context of panel data is known as _____.
a. confounding
b. differencing
c. clustering
d. attenuating

ANSWER: c

RATIONALE: **FEEDBACK:** The general approach to obtaining fully robust standard errors and test statistics in the context of panel data is known as clustering.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Appendix 13A

KEYWORDS: Bloom's: Knowledge

19. If a random sample is drawn at each time period, pooling the resulting random samples gives us a panel data set.
a. True
b. False

ANSWER: False

RATIONALE: **FEEDBACK:** If a random sample is drawn at each time period, pooling the resulting random samples gives us an independently pooled cross section.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Pooling Independent Cross Sections across Time

KEYWORDS: Bloom's: Knowledge

20. A natural experiment occurs when an endogenous event changes the environment in which individuals, families, firms, or cities operate.
a. True

b. False

ANSWER: False

RATIONALE: **FEEDBACK:** A natural experiment occurs when an exogenous event changes the environment in which individuals, families, firms, or cities operate.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Pooling Independent Cross Sections across Time

KEYWORDS: Bloom's: Knowledge

21. A natural experiment always has a control group, which is affected by the policy change, and a treatment group, which is not affected by the policy change.

a. True

b. False

ANSWER: False

RATIONALE: **FEEDBACK:** A natural experiment always has a control group, which is not affected by the policy change, and a treatment group, which is thought to be affected by the policy change.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Policy Analysis with Pooled Cross Sections

KEYWORDS: Bloom's: Knowledge

22. One way of organizing two periods of panel data is to have only one record per cross-sectional unit.

a. True

b. False

ANSWER: True

RATIONALE: **FEEDBACK:** One way of organizing two periods of panel data is to have only one record per cross-sectional unit.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two-Period Panel Data Analysis

KEYWORDS: Bloom's: Knowledge

23. Two-period panel data is used for program evaluation and policy analysis.

a. True

b. False

ANSWER: True

RATIONALE: **FEEDBACK:** Two-period panel data is used for program evaluation and policy analysis. In the simplest program evaluation setup, a sample of individuals, firms, cities, and so on is obtained in the first time period. Some of these units, those in the treatment group, then take part in a particular program in a later time period; the ones that do not are the control group.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Policy Analysis with Two-Period Panel Data

KEYWORDS: Bloom's: Knowledge

24. In a natural experiment, the same cross-sectional units appear in each time period.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** In panel data sets, the same cross-sectional units appear in each time period.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Policy Analysis with Two-Period Panel Data

KEYWORDS: Bloom's: Knowledge

25. First-differenced estimation gives unbiased estimators if the regression model includes a lagged dependent variable.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** First-differenced estimation is subject to serious biases if the regression model includes a lagged dependent variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Differencing with More Than Two Time Periods

KEYWORDS: Bloom's: Knowledge

1. Which of the following assumptions is required for obtaining unbiased fixed effect estimators?

- a. The errors are heteroskedastic.
- b. The errors are serially correlated.
- c. The explanatory variables are strictly exogenous.
- d. The unobserved effect is correlated with the explanatory variables.

ANSWER: c

RATIONALE: FEEDBACK: Under a strict exogeneity assumption on the explanatory variables, the fixed effects estimator is unbiased.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Fixed Effects Estimation

KEYWORDS: Bloom's: Knowledge

2. A pooled OLS estimator that is based on the time-demeaned variables is called the _____.

- a. random effects estimator
- b. fixed effects estimator
- c. least absolute deviations estimator
- d. instrumental variable estimator

ANSWER: b

RATIONALE: FEEDBACK: A pooled OLS estimator that is based on the time-demeaned variables is called the fixed effects estimator.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Fixed Effects Estimation

KEYWORDS: Bloom's: Knowledge

3. What should be the degrees of freedom (df) for fixed effects estimation if the data set includes ' N ' cross sectional units over ' T ' time periods and the regression model has ' k ' independent variables?

- a. $N-kT$
- b. $NT-k$
- c. $NT-N-k$
- d. $N-T-k$

ANSWER: c

RATIONALE: FEEDBACK: If the data set includes N cross sectional units over T time periods, the total number of observations is NT . Since the regression model includes k independent variables, the model should have $NT-k$ degrees of freedom. However, for each cross-sectional observation, we lose one df because of the time-demeaning. Therefore, the appropriate degrees of freedom is $NT - N - k$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Fixed Effects Estimation

KEYWORDS: Bloom's: Knowledge

4. Which of the following types of variables cannot be included in a fixed effects model?

- a. Dummy variable
- b. Discrete dependent variable
- c. Time-varying independent variable
- d. Time-constant independent variable

ANSWER: d

RATIONALE: **FEEDBACK:** A fixed effects model cannot include a time-constant independent variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Fixed Effects Estimation

KEYWORDS: Bloom's: Knowledge

5. Which of the following is a property of dummy variable regression?

- a. This method is best suited for panel data sets with many cross-sectional observations.
- b. The R-squared obtained from this method is lower than that obtained from regression on time-demeaned data.
- c. The degrees of freedom cannot be computed directly with this method.
- d. The major statistics obtained from this method are identical to that obtained from regression on time-demeaned data.

ANSWER: d

RATIONALE: **FEEDBACK:** The major statistics obtained from this method are identical to that obtained from regression on time-demeaned data.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Fixed Effects Estimation

KEYWORDS: Bloom's: Knowledge

6. Which of the following is a difference between a fixed effects estimator and a first-difference estimator?

- a. The fixed effects estimators are always larger than the first difference estimators in a two-period panel data analysis.
- b. The fixed effects estimator is more efficient than the first-difference estimator when the idiosyncratic errors are serially uncorrelated.
- c. The first difference estimator is more sensitive to nonnormality and heteroskedasticity.
- d. The bias in the first difference estimator depends on the time period (T) of analysis while the bias in the fixed effect does not depend on T.

ANSWER: b

RATIONALE: **FEEDBACK:** The fixed effects estimator is more efficient than the first-difference estimator when the idiosyncratic errors are serially uncorrelated.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Fixed Effects Estimation

KEYWORDS: Bloom's: Knowledge

7. Which of the following assumptions is required for obtaining unbiased random effect estimators?

- a. The idiosyncratic errors are heteroskedastic.
- b. The unobserved effect is independent of all explanatory variables in all time periods.

- c. The idiosyncratic errors are serially correlated.
- d. The unobserved effect is correlated with the explanatory variables.

ANSWER: b
RATIONALE: FEEDBACK: The unobserved effect is independent of all explanatory variables in all time periods.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Random Effects Models
KEYWORDS: Bloom's: Knowledge

8. The estimator obtained through regression on quasi-demeaned data is called the _____.
 a. random effects estimator
 b. fixed effects estimator
 c. hetroskedasticity-robust OLS estimator
 d. instrumental variables estimator

ANSWER: a
RATIONALE: FEEDBACK: The estimator obtained through regression on quasi-demeaned data is called the random effects estimator.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Random Effects Models
KEYWORDS: Bloom's: Knowledge

9. The random effects approach _____.
 a. cannot be used if the key explanatory variable is constant over time
 b. is preferred to pooled OLS because RE is generally more efficient
 c. is suitable if the Hausman test rejects the assumption that the unobserved effect is uncorrelated with the explanatory variables
 d. is more convincing than fixed effects for policy analysis using aggregate data

ANSWER: b
RATIONALE: FEEDBACK: RE is preferred to pooled OLS because RE is generally more efficient.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Random Effects Models
KEYWORDS: Bloom's: Knowledge

10. The random effects estimate is identical to the fixed effects estimate if the estimated transformation parameter, $\hat{\lambda}$, in generalized least squares estimation that eliminates serial correlation between error terms is, _____.
 a. less than zero
 b. equal to zero
 c. equal to one
 d. greater than one

ANSWER: c

RATIONALE: FEEDBACK: The random effects estimate is identical to the fixed effects estimate if the estimated transformation parameter, $\hat{\lambda}$, in generalized least squares estimation that eliminates serial correlation in error terms, is equal to one.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Random Effects Models

KEYWORDS: Bloom's: Knowledge

11. Which of the following is true of the correlated random effects approach (CRE)?
- a. The CRE approach assumes that the unobserved effect is uncorrelated with the observed explanatory variables.
 - b. The CRE approach cannot be used if the regression model includes a time-constant explanatory variable.
 - c. The CRE approach considers that the unobserved effect is correlated with the average level of explanatory variables.
 - d. The CRE estimate equals the random effects estimate.

ANSWER: c

RATIONALE: FEEDBACK: The CRE approach considers that the unobserved effect is correlated with the average level of explanatory variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Correlated Random Effects Approach

KEYWORDS: Bloom's: Knowledge

12. Which of the following is a reason for using the correlated random effects approach?
- a. It provides unbiased and consistent estimators when the idiosyncratic errors are serially correlated.
 - b. It provides unbiased and consistent estimators when the idiosyncratic errors are heteroskedastic.
 - c. It provides a more efficient estimate than the fixed effects approach.
 - d. It provides a way to include time-constant explanatory variables in a fixed effects analysis.

ANSWER: d

RATIONALE: FEEDBACK: It provides a way to include time-constant explanatory variables in a fixed effects analysis.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Correlated Random Effects Approach

KEYWORDS: Bloom's: Knowledge

13. In the correlated random effects approach, the regression model includes ____.
- a. time averages as separate explanatory variables
 - b. at least one dummy variable
 - c. more than one endogenous explanatory variable
 - d. an instrumental variable

ANSWER: a

RATIONALE: FEEDBACK: In the correlated random effects approach, the regression model includes time averages as separate explanatory variables.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Correlated Random Effects Approach
KEYWORDS: Bloom's: Knowledge

14. An economist wants to study the effect of income on savings. He collected data on 120 identical twins. Which of the following methods of estimation is the most suitable method, if income is correlated with the unobserved family effect?

- a. Random effects estimation
- b. Fixed effects estimation
- c. Ordinary least squares estimation
- d. Weighted Least squares estimation

ANSWER: b

RATIONALE: **FEEDBACK:** Fixed effects estimation is the most suitable method, if income is correlated with the unobserved family effect. The key requirement for using the random effects estimation is that income is uncorrelated with the unobserved family effect and ordinary least squares estimation will provide unbiased estimators if income is uncorrelated with the unobserved family effect.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic
TOPICS: The Correlated Random Effects Approach
KEYWORDS: Bloom's: Application

15. Which of the following statements is true?

- a. Fixed effects estimation is not suitable when the unobserved cluster effect is correlated with one or more explanatory variables.
- b. Fixed effects approach is not applicable if the key explanatory variables change only at the level of the cluster.
- c. The ordinary least squares standard errors are incorrect when there is cluster effect.
- d. Random effects estimation can be applied to a cluster sample only if the unobserved cluster effect is correlated with one or more explanatory variables.

ANSWER: c

RATIONALE: **FEEDBACK:** The ordinary least squares standard errors are incorrect when there is cluster effect.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Correlated Random Effects Approach
KEYWORDS: Bloom's: Knowledge

16. To obtain an estimator that reproduces the fixed effects estimates on the time-varying explanatory variables, ____.

- a. one must check whether the time-demeaning allows one to interpret the estimates
- b. one must check whether time-constant variables can be included in the fixed effects
- c. one must be able to interpret the time variations
- d. one must be careful in constructing the time averages

ANSWER: d

RATIONALE: **FEEDBACK:** To obtain an estimator that reproduces the fixed effects estimates on the time-varying explanatory variables, one must be careful in constructing the time averages.

POINTS: 1
 DIFFICULTY: Easy
 NATIONAL STANDARDS: United States - BUSPROG: Analytic
 TOPICS: The Correlated Random Effects Approach
 KEYWORDS: Bloom's: Knowledge

17. The appropriate time average of $\{y_{it}\}$ is $\bar{y}_i = T_i^{-1} \sum_{t=1}^T s_{it} y_{it}$, where T_i is:

- a. the dummy variable, which equals one when a complete set of data is observed.
- b. the total number of time periods for cross-sectional observation i .
- c. the total number of complete time periods for cross-sectional observation i .
- d. the explanatory variable for cross-sectional observation i .

ANSWER: c

RATIONALE: FEEDBACK: The appropriate time average of $\{y_{it}\}$ is $\bar{y}_i = T_i^{-1} \sum_{t=1}^T s_{it} y_{it}$, where T_i is the total number of complete time periods for cross-sectional observation i .

POINTS: 1
 DIFFICULTY: Easy
 NATIONAL STANDARDS: United States - BUSPROG: Analytic
 TOPICS: The Correlated Random Effects Approach
 KEYWORDS: Bloom's: Knowledge

18. A manufacturing company is sampled from a population of manufacturing companies, and then the data on at least two employees are recorded. This is an example of:

- a. matched pair samples.
- b. random samples.
- c. cluster samples.
- d. nonrandom samples.

ANSWER: c

RATIONALE: FEEDBACK: This is an example of cluster samples. A cluster sample is sampled from a population of clusters rather than sampling individuals from the population of individuals.

POINTS: 1
 DIFFICULTY: Easy
 NATIONAL STANDARDS: United States - BUSPROG: Analytic
 TOPICS: Applying Panel Data Methods to Other Data Structures
 KEYWORDS: Bloom's: Application

19. A data set is called an unbalanced panel if it has missing years for at least some cross-sectional units in the sample.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: A data set is called an unbalanced panel if it has missing years for at least some cross-sectional units in the sample.

POINTS: 1
 DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Fixed Effects Estimation

KEYWORDS: Bloom's: Knowledge

20. In a random effects model, we assume that the unobserved effect is correlated with each explanatory variable.

a. True

b. False

ANSWER: False

RATIONALE: **FEEDBACK:** In a random effects model, we assume that the unobserved effect is uncorrelated with each explanatory variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Random Effects Models

KEYWORDS: Bloom's: Knowledge

21. The value of the estimated transformation parameter in generalized least square estimation that eliminates serial correlation in error terms indicates whether the estimates are likely to be closer to the pooled OLS or the fixed effects estimates.

a. True

b. False

ANSWER: True

RATIONALE: **FEEDBACK:** The value of the estimated transformation parameter in generalized least squares estimation that eliminates serial correlation in error terms indicates whether the estimates are likely to be closer to the pooled OLS or the fixed effects estimates.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Random Effects Models

KEYWORDS: Bloom's: Knowledge

22. The correlated random effects approach cannot be applied to models with many time-varying explanatory variables.

a. True

b. False

ANSWER: False

RATIONALE: **FEEDBACK:** The correlated random effects approach can be applied to models with many time-varying explanatory variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Correlated Random Effects Approach

KEYWORDS: Bloom's: Knowledge

23. Pooled ordinary least squares estimation is commonly applied to cluster samples when eliminating a cluster effect via fixed effects is infeasible or undesirable.

a. True

b. False

ANSWER: True

RATIONALE: FEEDBACK: Pooled ordinary least squares estimation is commonly applied to cluster samples when eliminating a cluster effect via fixed effects is infeasible or undesirable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Applying Panel Data Methods to Other Data Structures

KEYWORDS: Bloom's: Knowledge

24. The size of all the clusters obtained from a population are always the same.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: The size of all the clusters obtained from a population are rarely the same.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Applying Panel Data Methods to Other Data Structures

KEYWORDS: Bloom's: Comprehension

25. In a true cluster sample, the individuals are first drawn from the clusters.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: In a true cluster sample, the clusters are first drawn from a population of clusters, and then individuals are drawn from the clusters.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Applying Panel Data Methods to Other Data Structures

KEYWORDS: Bloom's: Knowledge

1. Consider the following simple regression model: $y = \beta_0 + \beta_1 x_1 + u$. In order to obtain consistent estimators of β_0 and β_1 , when x and u are correlated, a new variable z is introduced into the model which satisfies the following two conditions: $\text{Cov}(z, x) \neq 0$ and $\text{Cov}(z, u) = 0$. The variable z is called a(n) _____ variable.

- a. dummy
- b. instrumental
- c. lagged dependent
- d. random

ANSWER: b

RATIONALE: FEEDBACK: Variable z is called an instrumental variable since $\text{Cov}(z, x) \neq 0$ and $\text{Cov}(z, u) = 0$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS: Bloom's: Knowledge

2. Consider the following simple regression model: $y = \beta_0 + \beta_1 x_1 + u$. Suppose z is an instrument for x . Which of the following conditions denotes instrument exogeneity?

- a. $\text{Cov}(z, u) > 0$
- b. $\text{Cov}(z, x) > 0$
- c. $\text{Cov}(z, u) = 0$
- d. $\text{Cov}(z, x) = 0$

ANSWER: c

RATIONALE: FEEDBACK: The condition $\text{Cov}(z, u) = 0$ denotes instrument exogeneity in this case.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS: Bloom's: Knowledge

3. Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$. Suppose z is an instrument for x . Which of the following conditions denotes instrument relevance?

- a. $\text{Cov}(z, u) > 0$
- b. $\text{Cov}(z, u) < 0$
- c. $\text{Cov}(z, x) \neq 0$
- d. $\text{Cov}(z, x z) = 0$

ANSWER: c

RATIONALE: FEEDBACK: The condition $\text{Cov}(z, x) \neq 0$ denotes instrument relevance.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS: Bloom's: Knowledge

4. Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$. Suppose z is an instrument for x .

Which of the following statements is true?

- a. The condition $\text{Cov}(z,u) = 0$ can be tested statistically.
- b. The condition $\text{Cov}(z,x) \neq 0$ cannot be tested statistically.
- c. The instrumental variables estimator is always biased if $\text{Cov}(x,u) \neq 0$.
- d. The ordinary least squares estimator is unbiased if $\text{Cov}(x,u) \neq 0$.

ANSWER:

c

RATIONALE:

FEEDBACK: The instrumental variables estimator is always biased if $\text{Cov}(x,u) \neq 0$.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS:

Bloom's: Knowledge

5. Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$. Suppose z is an instrument for x . if $\text{Cov}(z,u) = 0$ and $\text{Cov}(z,x) \neq 0$, the value of β_1 in terms of population covariances is _____.

- a. $\frac{\text{Cov}(z,y)}{\text{Cov}(z,x)}$
- b. $\frac{\text{Cov}(z,u)}{\text{Cov}(z,x)}$
- c. $\text{Cov}(z,u)$
- d. $\text{Cov}(z,x)$

ANSWER:

a

RATIONALE:

FEEDBACK: The value of β_1 is $\frac{\text{Cov}(z,y)}{\text{Cov}(z,x)}$.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS:

Bloom's: Knowledge

6. The sampling variance for the instrumental variables (IV) estimator is larger than the variance for the ordinary least square estimators (OLS) because _____.

- a. $R^2 > 1$
- b. $R^2 < 0$
- c. $R^2 = 1$
- d. $R^2 < 1$

ANSWER:

d

RATIONALE:

FEEDBACK: The variance of the OLS estimator differs from the comparable formula for the IV estimator in that R^2 appears in the denominator of the IV variance. Because an R -squared is always less than one, the IV variance is always larger than the OLS variance.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS: Bloom's: Knowledge

7. Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$. The variable z is a poor instrument for x if ____.
- a. there is a high correlation between z and x
 - b. there is a low correlation between z and x
 - c. there is a high correlation between z and u
 - d. there is a low correlation between z and u

ANSWER: b

RATIONALE: FEEDBACK: The variable z is a poor instrument for x if there is a low correlation between z and x .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS: Bloom's: Knowledge

8. Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$. Suppose $\text{Corr}(x, u) > 0$, $\text{Corr}(z, x) > 0$, and $\text{Corr}(z, u) < 0$. Then, the IV estimator has a(n) ____.
- a. downward bias
 - b. asymptotic bias
 - c. upward bias
 - d. substantial bias

ANSWER: a

RATIONALE: FEEDBACK: Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$. Suppose $\text{Corr}(x, u) > 0$, $\text{Corr}(z, x) > 0$, and $\text{Corr}(z, u) < 0$. Then, the IV estimator has a downward bias.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS: Bloom's: Knowledge

9. Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$. Suppose $\text{Corr}(x, u) > 0$, $\text{Corr}(z, x) > 0$, and $\text{Corr}(z, u) < 0$. Then, the OLS estimator has a(n) ____.
- a. downward bias
 - b. asymptotic bias
 - c. upward bias
 - d. substantial bias

ANSWER: c

RATIONALE: FEEDBACK: Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$. Suppose $\text{Corr}(x, u) > 0$, $\text{Corr}(z, x) > 0$, and $\text{Corr}(z, u) < 0$. Then, the OLS estimator has an upward bias.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS: Bloom's: Knowledge

10. Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$ and z is an instrument for x . Suppose x and z are both positively correlated with u and $\text{Corr}(z, x) > 0$. Then, the asymptotic bias in the IV estimator is less than that for OLS only if:

- a. $\text{Corr}(z, u) / \text{Corr}(z, x) = \text{Corr}(x, u)$.
- b. $\text{Corr}(z, u) / \text{Corr}(z, x) > \text{Corr}(x, u)$.
- c. $\text{Corr}(z, u) / \text{Corr}(z, x) < \text{Corr}(x, u)$.
- d. $\text{Corr}(z, u) / \text{Corr}(z, x) \neq \text{Corr}(x, u)$.

ANSWER: c

RATIONALE: FEEDBACK: Consider the following simple regression model $y = \beta_0 + \beta_1 x_1 + u$ and z is an instrument for x . Suppose x and z are both positively correlated with u and $\text{Corr}(z, x) > 0$. Then, the asymptotic bias in the IV estimator is less than that for OLS only if $\text{Corr}(z, u) / \text{Corr}(z, x) < \text{Corr}(x, u)$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS: Bloom's: Knowledge

11. Which of the following assumptions is known as exclusion restrictions?

- a. The assumption that an instrumental variable is excluded from a regression model and is correlated with the error term.
- b. The assumption that an instrumental variable is excluded from a regression model and is correlated with an exogenous explanatory variable.
- c. The assumption that an exogenous explanatory variable is excluded from a regression model and is uncorrelated with the error term.
- d. The assumption that an endogenous explanatory variable excluded from a regression model and is uncorrelated with the error term.

ANSWER: c

RATIONALE: FEEDBACK: The assumption that an exogenous explanatory variable is excluded from a regression model and is uncorrelated with the error term.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two Stage Least Squares

KEYWORDS: Bloom's: Knowledge

12. Which of the following assumptions is required for two-stage least squares estimation method?

- a. There are perfect linear relationships among the instrumental variables.
- b. There is strong correlation between each instrumental variable and the error term.
- c. The conditional variance of the error term depends on an exogenous explanatory variable.
- d. The error term has zero mean.

ANSWER: d

RATIONALE: FEEDBACK: The error term has zero mean.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Two Stage Least Squares
KEYWORDS: Bloom's: Knowledge

13. Which of the following is true of two stage least squares estimators?

- a. The two stage least squares estimator is equal to the instrumental variable estimator if R^2 is equal to 1.
- b. The two stage least squares estimators are biased if the regression model exhibits multicollinearity.
- c. The two stage least squares estimators have lower variance than the ordinary least squares estimators.
- d. The two stage least squares estimators have large standard errors when R^2 lies close to 0.

ANSWER: b
RATIONALE: FEEDBACK: The two stage least squares estimators are biased if the regression model exhibits multicollinearity.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Two Stage Least Squares
KEYWORDS: Bloom's: Knowledge

14. The necessary condition for identification of an equation is called the _____.

- a. order condition
- b. rank condition
- c. condition of instrumental exogeneity
- d. the condition of instrumental relevance

ANSWER: a
RATIONALE: FEEDBACK: The necessary condition for identification of an equation is called the order condition.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Two Stage Least Squares
KEYWORDS: Bloom's: Knowledge

15. The order condition for identification of an equation requires that there should be _____.

- a. at least one exogenous explanatory variable in a structural equation
- b. at least as many excluded exogenous explanatory variables as there are included endogenous explanatory variables
- c. at least as many dummy variables in an equation as there are exogenous explanatory variables
- d. as many lagged independent variables in an equation as there are exogenous explanatory variables

ANSWER: b
RATIONALE: FEEDBACK: The order condition for identification of an equation requires that there should be at least as many excluded exogenous explanatory variables as there are included endogenous explanatory variables.

POINTS: 1
DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two Stage Least Squares

KEYWORDS: Bloom's: Knowledge

16. The procedure of comparing different instrumental variables estimates of the same parameter is an example of testing _____.

- a. overidentifying restrictions
- b. endogeneity
- c. heteroskedasticity
- d. serial correlation

ANSWER: a

RATIONALE: FEEDBACK: The procedure of comparing different instrumental variables estimates of the same parameter is an example of testing overidentifying restrictions.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Endogeneity and Testing Overidentifying Restrictions

KEYWORDS: Bloom's: Knowledge

17. The test for overidentifying restrictions is valid if _____.

- a. the regression model exhibits heteroskedasticity
- b. the regression model exhibits homoskedasticity
- c. the number of instrumental variables are less than the number of endogenous explanatory variables
- d. the number of instrumental variables are just enough for obtaining consistent estimators

ANSWER: b

RATIONALE: FEEDBACK: The test for overidentifying restrictions is valid if the regression model exhibits homoskedasticity.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Endogeneity and Testing Overidentifying Restrictions

KEYWORDS: Bloom's: Knowledge

18. Which of the following assumptions is required for two stage least squares estimation with time series data but not required for two-stage least squares estimation with cross sectional data?

- a. The conditional mean of the error term is zero.
- b. The error term has constant conditional variance.
- c. The model includes at least one dummy variable.
- d. The error terms are not serially correlated.

ANSWER: d

RATIONALE: FEEDBACK: The additional assumption required for two stage least squares estimation using time-series data is that there is no serial correlation.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Applying 2SLS to Time Series Equations

KEYWORDS: Bloom's: Knowledge

19. If the instrumental variable estimator has an upward bias, the ordinary least square estimator always has a downward bias.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** It is possible for the directions of the asymptotic biases to be different for IV and OLS but this situation is usually rare in practice.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Motivation: Omitted Variables in a Simple Regression Model

KEYWORDS: Bloom's: Knowledge

20. A standard linear model which is supposed to measure a causal relationship is called a structural equation.

- a. True
- b. False

ANSWER: True

RATIONALE: **FEEDBACK:** A standard linear model which is supposed to measure a causal relationship is called a structural equation.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: IV Estimation of the Multiple Regression Model

KEYWORDS: Bloom's: Knowledge

21. If we focus only on consistency, it is necessarily better to use IV than OLS if the correlation between z and u is smaller than that between x and u .

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** If we focus only on consistency, it is not necessarily better to use IV than OLS if the correlation between z and u is smaller than that between x and u .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Two Stage Least Squares

KEYWORDS: Bloom's: Knowledge

22. Instrumental variables cannot be used for estimating a regression equation if the regression model suffers from the measurement error problem.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** The instrumental variables procedure can be used for estimation if the regression model suffers from the measurement error problem.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: IV Solutions to Errors-in-Variables Problems
KEYWORDS: Bloom's: Knowledge

23. The two stage least squares estimator is less efficient than the ordinary least squares estimator when the explanatory variables are exogenous.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: The two stage least squares estimator is less efficient than the ordinary least squares estimator when the explanatory variables are exogenous.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Testing for Endogeneity and Testing Overidentifying Restrictions
KEYWORDS: Bloom's: Knowledge

24. Increasing the number of overidentifying restrictions can cause severe biases in two stage least squares estimators.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: Increasing the number of overidentifying restrictions can cause severe biases in two stage least squares estimators.

POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Testing for Endogeneity and Testing Overidentifying Restrictions
KEYWORDS: Bloom's: Knowledge

25. Two stage least squares estimation cannot be applied to a panel data set.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: Two stage least squares estimation can be applied to a panel data set.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Applying 2SLS to Pooled Cross Sections and Panel Data
KEYWORDS: Bloom's: Knowledge

1. In econometrics, simultaneity arises when:
- strictly exogenous explanatory variables determine the dependent variable through a step-by-step process.
 - the error term is correlated with both the dependent variable and explanatory variables.
 - one or more of the explanatory variables is jointly determined with the dependent variable.
 - both serial correlation and heteroskedasticity are present in an hypothesized model.

ANSWER: c

RATIONALE: FEEDBACK: In econometrics, simultaneity arises when one or more of the explanatory variables is jointly determined with the dependent variable, typically through an equilibrium process.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Nature of Simultaneous Equations Models

KEYWORDS: Bloom's: Knowledge

2. The following simultaneous equations describe the demand and supply for a particular good in a competitive market.

$$Q_i = \alpha_1 P_i + \beta_1 z_{i1} + u_{i1}$$

$$Q_i = \alpha_2 P_i + \beta_2 z_{i2} + u_{i2}$$

Which of the following are the endogenous variables in this model?

- P_i , z_{i1} , and z_{i2}
- P_i and Q_i
- z_{i1} , and z_{i2}
- u_{i1} and u_{i2}

ANSWER: b

RATIONALE: FEEDBACK: P_i and Q_i are the endogenous variables in the given simultaneous equation model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Nature of Simultaneous Equations Models

KEYWORDS: Bloom's: Knowledge

3. In a simultaneous equations model, if any variable is determined outside of the model, then it is considered a(n):
- endogenous variable.
 - random variable.
 - exogenous variable.
 - error variable.

ANSWER: c

RATIONALE: FEEDBACK: In a simultaneous equations model, if any variable is determined outside of the model, then it is considered an exogenous variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Nature of Simultaneous Equations Models

KEYWORDS: Bloom's: Knowledge

4. Which of the following correctly identifies a characteristic of structural equations?
- A structural equation should contain equal number of dependent and independent variables.
 - A structural equation should contain equal number of endogenous and exogenous variables.
 - A structural equation should have a behavioral, ceteris paribus interpretation on its own.
 - A structural equation should not contain structural errors.

ANSWER: c

RATIONALE: FEEDBACK: A structural equation should have a behavioral, ceteris paribus interpretation on its own.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Nature of Simultaneous Equations Models

KEYWORDS: Bloom's: Knowledge

5. The following equations represent a simultaneous equations model:

$$K_1 = \alpha_1 K_2 + \beta_1 z_1 + u_1$$

$$K_2 = \alpha_2 K_1 + \beta_2 z_2 + u_2$$

The reduced form equation for K_2 will express:

- K_1 as a function of K_2 and the error terms.
- K_2 as a function of K_1 and the error terms.
- K_2 as a function of exogenous variables and the error terms.
- K_1 as a function of exogenous variables, the error terms, and K_2 .

ANSWER: c

RATIONALE: FEEDBACK: For the given simultaneous equations model, the reduced form equation for K_2 will express K_2 as a function of exogenous variables and the error terms.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Simultaneity Bias in OLS

KEYWORDS: Bloom's: Knowledge

6. The following equations represent a simultaneous equations model:

$$K_1 = \alpha_1 K_2 + \beta_1 z_1 + u_1$$

$$K_2 = \alpha_2 K_1 + \beta_2 z_2 + u_2$$

OLS will suffer from simultaneity bias if:

- u_1 is correlated with z_1 .
- z_1 is correlated with z_2 .
- K_2 is correlated with u_1 .
- K_1 is correlated with u_1 .

ANSWER: c

RATIONALE: FEEDBACK: In the given simultaneous equation model, OLS will suffer from simultaneity bias if K_2 is correlated with u_1 .

POINTS: 1

DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Simultaneity Bias in OLS
KEYWORDS: Bloom's: Knowledge

7. Refer to the simultaneous equations model above. The reduced form error from the reduced form equation for K_2 will be a:

- a. quadratic function of u_1 and u_2 , and correlated with z_1 and z_2 .
- b. quadratic function of u_1 and u_2 , and uncorrelated with z_1 and z_2 .
- c. linear function of u_1 and u_2 , and correlated with z_1 and z_2 .
- d. linear function of u_1 and u_2 , and uncorrelated with z_1 and z_2 .

ANSWER: d

RATIONALE: FEEDBACK: The reduced form error from the reduced form equation for K_2 will be a linear function of u_1 and u_2 , and uncorrelated with z_1 and z_2 .

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Simultaneity Bias in OLS

KEYWORDS: Bloom's: Knowledge

8. Exclusion restrictions are said to be imposed in a two-equation simultaneous equations model if it is assumed that:

- a. certain exogenous variables do not appear in the first equation and others are absent from the second equation.
- b. certain endogenous variables do not appear in the first equation and others are absent from the second equation.
- c. the error terms in each equation is correlated with the exogenous variables.
- d. the error terms in each equation is uncorrelated with the exogenous variables.

ANSWER: a

RATIONALE: FEEDBACK: Exclusion restrictions are said to be imposed in a two-equation simultaneous equations model if it is assumed that certain exogenous variables do not appear in the first equation and others are absent from the second equation.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Identifying and Estimating a Structural Equation

KEYWORDS: Bloom's: Knowledge

9. Which of the following is a method which can be used for estimation in simultaneous equations models?

- a. Feasible generalized least squares estimation
- b. Prais-Winsten transformation
- c. Cochrane-Orcutt transformation
- d. Two stage least squares estimation

ANSWER: d

RATIONALE: FEEDBACK: The two stage least squares estimation can be used in simultaneous equations models.

POINTS: 1

DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Identifying and Estimating a Structural Equation
KEYWORDS: Bloom's: Knowledge

10. The rank condition for identification of a structural equation states that the first equation in a two-equation simultaneous equations model is identified if, and only if:

- the first equation contains at least one exogenous variable (with a nonzero coefficient) that is excluded from the second equation.
- the first equation contains at least two exogenous variables (with a nonzero coefficient) that are excluded from the second equation.
- the second equation contains at least one exogenous variable (with a nonzero coefficient) that is excluded from the first equation.
- the second equation contains at least two exogenous variables (with a nonzero coefficient) that are excluded from the first equation.

ANSWER:

c

RATIONALE:

FEEDBACK: The rank condition for identification of a structural equation states that the first equation in a two-equations simultaneous equations model is identified if, and only if, the second equation contains at least one exogenous variable (with a nonzero coefficient) that is excluded from the first equation.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Identifying and Estimating a Structural Equation

KEYWORDS: Bloom's: Knowledge

11. The following equations represent a two-equation model:

$$y_1 = \beta_{10} + \alpha_1 y_2 + z_1 \beta_1 + u_1$$

$$y_2 = \beta_{20} + \alpha_2 y_1 + z_2 \beta_2 + u_2$$

where, y_1 and y_2 are the:

- endogenous variables.
- structural error terms.
- exogenous variables.
- intercepts.

ANSWER:

a

RATIONALE:

FEEDBACK: In the two-equation model, y_1 and y_2 are the endogenous variables.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Identifying and Estimating a Structural Equation

KEYWORDS: Bloom's: Knowledge

12. Which of the following statements is true?

- The use of 2SLS is applicable to simultaneous equations model with at most two equations.
- Identification of simultaneous equations with three or more equations is based on matrix algebra.
- 2SLS method used in the estimation of simultaneous equations is an example of a system estimation method.

d. The maximum number of equations permissible for a simultaneous equations model is four.

ANSWER: b

RATIONALE: FEEDBACK: Identification of simultaneous equations with three or more equations is based on matrix algebra.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Systems with More than Two Equations

KEYWORDS: Bloom's: Knowledge

13. An equation in the simultaneous equations model satisfies the order condition for identification if:

- a. the number of excluded endogenous variables from the equation is at most as large as the number of right-hand side exogenous variables.
- b. the number of excluded endogenous variables from the equation is at least as large as the number of right-hand side exogenous variables.
- c. the number of excluded exogenous variables from the equation is at most as large as the number of right-hand side endogenous variables.
- d. the number of excluded exogenous variables from the equation is at least as large as the number of right-hand side endogenous variables.

ANSWER: d

RATIONALE: FEEDBACK: An equation in the simultaneous equations model satisfies the order condition for identification if the number of excluded exogenous variables from the equation is at least as large as the number of right-hand side endogenous variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Systems with More than Two Equations

KEYWORDS: Bloom's: Knowledge

14. Which of the following equations is an overidentified equation?

- a. $y_1 = \alpha_{12}y_2 + \alpha_{13}y_3 + \beta_{11}z_1 + u_1$
- b. $y_2 = \alpha_{21}y_1 + \beta_{21}z_2 + \beta_{23}z_3 + u_2$
- c. $y_3 = \alpha_{32}y_1 + \beta_{31}z_1 + \beta_{32}z_2 + \beta_{33}z_3 + \beta_{34}z_4 + u_3$
- d. $y_1 = \beta_{10} + \alpha_{12}y_2 + z_1\beta_1 + u_1$

ANSWER: a

RATIONALE: FEEDBACK: $y_1 = \alpha_{12}y_2 + \alpha_{13}y_3 + \beta_{11}z_1 + u_1$ is an overidentified equation because we need only two IVs (for y_2 and y_3) but we have three available (z_2 , z_3 , and z_4); there is one overidentifying restriction in this equation.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Systems with More than Two Equations

KEYWORDS: Bloom's: Comprehension

15. A predetermined variable in a simultaneous equations model is:

- a. a constant.

- b. the error term.
- c. a lagged variable.
- d. an omitted variable.

ANSWER:

c

RATIONALE:

FEEDBACK: A predetermined variable in a simultaneous equations model is a lagged variable.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Simultaneous Equations Models with Time Series

KEYWORDS:

Bloom's: Knowledge

16. Which of the following correctly highlights a limitation of applying simultaneous equation models to time series data?

- a. Most time series have variables with a unit root and 2SLS is complicated when applied to equations with such variables.
- b. 2SLS estimates are inefficient when applied to variables that are not in their levels but in first differences.
- c. It is difficult to form simultaneous equations which satisfy the rank and order conditions using time series data.
- d. The problem of serial correlation greatly limits the efficiency of simultaneous equation models and leads to inefficient estimations.

ANSWER:

a

RATIONALE:

FEEDBACK: Most time series have variables with a unit root and 2SLS is complicated when applied to equations with such variables.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Simultaneous Equations Models with Time Series

KEYWORDS:

Bloom's: Knowledge

17. An alternative to using simultaneous equation models with panel data is:

- a. to use OLS estimates after first differencing the data.
- b. to use fixed effects transformation on the equations and then apply 2SLS.
- c. to convert the equations into reduced form and then apply feasible generalized least squares.
- d. to convert the equations into reduced form and then apply OLS.

ANSWER:

b

RATIONALE:

FEEDBACK: An alternative to using simultaneous equation models with panel data is to use fixed effects transformation on the equations and then apply 2SLS.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Simultaneous Equations Model with Panel Data

KEYWORDS:

Bloom's: Knowledge

18. Which of the following statements is true?

- a. White test can be used to efficiently determine the presence of serial correlation in panel data.
- b. The t statistic is not an efficient test to determine serial correlation in panel data.
- c. Instrumental variables for both endogenous and exogenous variables are required for estimating simultaneous

equation models concerned with panel data.

- d. 2SLS should be applied to simultaneous equation models with panel data only after removing the unobserved effects from the equations of interest.

ANSWER: d

RATIONALE: FEEDBACK: 2SLS should be applied to simultaneous equation models with panel data only after removing the unobserved effects from the equations of interest.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Simultaneous Equations Model with Panel Data

KEYWORDS: Bloom's: Knowledge

19. A simultaneous equations model is suitable whenever two variables are determined simultaneously.

- a. True
b. False

ANSWER: False

RATIONALE: FEEDBACK: Just because two variables are determined simultaneously, it does not imply that a simultaneous equations model is suitable. The criteria for using a simultaneous equations model is that each equation in the model should make sense in isolation from the other equation.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Nature of Simultaneous Equations Models

KEYWORDS: Bloom's: Knowledge

20. OLS is biased and inconsistent when applied to a structural equation in a simultaneous equations system.

- a. True
b. False

ANSWER: True

RATIONALE: FEEDBACK: OLS is biased and inconsistent when applied to a structural equation in a simultaneous equations system.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Simultaneity Bias in OLS

KEYWORDS: Bloom's: Knowledge

21. The instrumental variables in the two stage least squares estimation method consists of endogenous variables appearing in either equation.

- a. True
b. False

ANSWER: False

RATIONALE: FEEDBACK: The instrumental variables in the two stage least squares method consists of exogenous variables appearing in either equation.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Identifying and Estimating a Structural Equation
KEYWORDS: Bloom's: Knowledge

22. The order condition is a necessary and sufficient condition for identification of an equation in a simultaneous equations model.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** The order condition is a necessary condition for identification of an equation in a simultaneous equations model. It is not a sufficient condition for identification.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Systems with More than Two Equations
KEYWORDS: Bloom's: Knowledge

23. The number of overidentifying restrictions equals the total number of exogenous variables in the system plus the total number of explanatory variables in the equation.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** The number of overidentifying restrictions equals the total number of exogenous variables in the system minus the total number of explanatory variables in the equation.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Systems with More than Two Equations
KEYWORDS: Bloom's: Knowledge

24. If a structured model contains a time trend—which may capture exogenous, trending factors that are not directly modeled—then the trend acts as its own instrumental variable.

- a. True
- b. False

ANSWER: True

RATIONALE: **FEEDBACK:** If a structured model contains a time trend, then the trend acts as its own instrumental variable.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Simultaneous Equations Models with Time Series
KEYWORDS: Bloom's: Knowledge

25. The first step in estimating simultaneous equations models (SEMs) with panel data is to find instrumental variables for the endogenous variables in the transformed equation.

- a. True

b. False

ANSWER:

False

RATIONALE:

FEEDBACK: The first step in estimating SEMs with panel data is to eliminate the unobserved effects from the equations of interest using the fixed effects transformation.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS:

Simultaneous Equations Model with Panel Data

KEYWORDS:

Bloom's: Knowledge

1. Which of the following is an example of a binary response model?

- a. MA model
- b. ARCH model
- c. GARCH model
- d. Logit model

ANSWER: d

RATIONALE: FEEDBACK: The logit model is an example of a binary response model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Logit and Probit Models for Binary Response

KEYWORDS: Bloom's: Knowledge

2. The model: $G(z) = [\exp(z)]/[1 + \exp(z)]$, where G is between zero and one for all real numbers 'z', represents a:

- a. logit model.
- b. probit model.
- c. Tobit model.
- d. linear probability model.

ANSWER: a

RATIONALE: FEEDBACK: The following model: $G(z) = [\exp(z)]/[1 + \exp(z)]$, where G is between zero and one for all real numbers 'z', represents a logit model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Logit and Probit Models for Binary Response

KEYWORDS: Bloom's: Knowledge

3. The model: $G(z) = \Phi(z) = \int_{-\infty}^z \phi(v) dv$, where $\phi(z) = (2\pi)^{-1/2} \exp(-z^2/2)$ represents a:

- a. Tobit model.
- b. logit model.
- c. probit model.
- d. linear probability model.

ANSWER: c

RATIONALE: FEEDBACK: The following model $G(z) = \Phi(z) = \int_{-\infty}^z \phi(v) dv$, where $\phi(z) = (2\pi)^{-1/2} \exp(-z^2/2)$ represents a probit model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Logit and Probit Models for Binary Response

KEYWORDS: Bloom's: Knowledge

4. In the probit model, G is the:

- a. standard normal cumulative distribution function.

- b. cumulative distribution of normal distribution function.
- c. standard normal probability distribution function.
- d. normal probability distribution function.

ANSWER:

a

RATIONALE:

FEEDBACK: In the probit model, G is the standard normal cumulative distribution function.

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Logit and Probit Models for Binary Response

KEYWORDS: Bloom's: Knowledge

5. The likelihood ratio statistic is given by:

- a. $LR = (\log\text{-likelihood}_{\text{unrestricted}} + \log\text{-likelihood}_{\text{restricted}})$
- b. $LR = 2 \times (\log\text{-likelihood}_{\text{unrestricted}} + \log\text{-likelihood}_{\text{restricted}})$
- c. $LR = (\log\text{-likelihood}_{\text{unrestricted}} - \log\text{-likelihood}_{\text{restricted}})$
- d. $LR = 2 \times (\log\text{-likelihood}_{\text{unrestricted}} - \log\text{-likelihood}_{\text{restricted}})$

ANSWER:

d

RATIONALE:

FEEDBACK: The likelihood ratio statistic is given by $LR = 2 \times (\log\text{-likelihood}_{\text{unrestricted}} - \log\text{-likelihood}_{\text{restricted}})$

POINTS:

1

DIFFICULTY:

Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Logit and Probit Models for Binary Response

KEYWORDS: Bloom's: Knowledge

6. The difference between the LPM model and the logit and probit models is that:

- a. the LPM assumes constant marginal effects for all the independent variables, while the logit and probit models imply diminishing magnitudes of the partial effects.
- b. the LPM assumes constant marginal effects for some of the independent variables, while the logit and probit models imply diminishing magnitudes of the partial effects.
- c. the LPM assumes constant marginal effects for the dependent variable, while the logit and probit models imply diminishing magnitudes of the partial effects.
- d. the LPM assumes different marginal effects for all independent variables, while the logit and probit models imply diminishing magnitudes of the marginal effects.

ANSWER:

a

RATIONALE:

FEEDBACK: The difference between the LPM model and the logit and probit models is that the LPM assumes constant marginal effects for all the independent variables, while the logit and probit models imply diminishing magnitudes of the partial effects.

POINTS:

1

DIFFICULTY:

Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Logit and Probit Models for Binary Response

KEYWORDS: Bloom's: Knowledge

7. The _____ model is designed to model corner solution dependent variables.

- a. linear probability
- b. logit
- c. probit
- d. Tobit

ANSWER: d

RATIONALE: FEEDBACK: The Tobit model is designed to model corner solution dependent variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Tobit Model for Corner Solution Responses

KEYWORDS: Bloom's: Knowledge

8. The model: $y^* = \beta_0 + \mathbf{x}\beta + u$, given $u|x \sim \text{Normal}(0, \sigma^2)$ and $y = \max(0, y^*)$ represents a:

- a. ARCH model.
- b. GARCH model
- c. Tobit model
- d. logit model

ANSWER: c

RATIONALE: FEEDBACK: The model: $y^* = \beta_0 + \mathbf{x}\beta + u$, given $u|x \sim \text{Normal}(0, \sigma^2)$ and $y = \max(0, y^*)$ represents a Tobit model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Tobit Model for Corner Solution Responses

KEYWORDS: Bloom's: Knowledge

9. Which of the following tests can be used to test hypotheses with multiple restrictions under a Tobit model?

- a. White test
- b. Wald test
- c. Dickey Fuller test
- d. Durbin Watson test

ANSWER: b

RATIONALE: FEEDBACK: The Wald test can be used to check for multiple restrictions under a Tobit model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Tobit Model for Corner Solution Responses

KEYWORDS: Bloom's: Knowledge

10. A common form of sample selection that does not observe the dependent variable because of the outcome of another variable is called _____.

- a. nonrandom sample selection
- b. exogenous sample selection
- c. incidental truncation
- d. endogenous sample selection

ANSWER: c
RATIONALE: FEEDBACK: A common form of sample selection that does not observe the dependent variable because of the outcome of another variable is called incidental truncation.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Sample Selection Corrections
KEYWORDS: Bloom's: Knowledge

11. A count variable refers to a dependent variable that can take on:
- a. nonnegative integer values.
 - b. nonnegative fractional values.
 - c. negative fractional values.
 - d. negative integer values.

ANSWER: a
RATIONALE: FEEDBACK: A count variable refers to a dependent variable that can take on nonnegative integer values.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Poisson Regression Model
KEYWORDS: Bloom's: Knowledge

12. Which of the following statements is true?
- a. Taking logarithmic of a count variable is a suitable way to model it.
 - b. All standard count data distributions exhibit heteroskedasticity.
 - c. The nonlinear least squares estimation aims at maximizing R^2 .
 - d. Count variables cannot take on the value zero.

ANSWER: b
RATIONALE: FEEDBACK: All standard count data distributions exhibit heteroskedasticity.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: The Poisson Regression Model
KEYWORDS: Bloom's: Knowledge

13. The nominal distribution for count data is the:
- a. binomial distribution.
 - b. normal distribution.
 - c. Poisson distribution.
 - d. Bernoulli distribution.

ANSWER: c
RATIONALE: FEEDBACK: The nominal distribution for count data is the Poisson distribution.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Poisson Regression Model

KEYWORDS: Bloom's: Knowledge

14. Which of the following statements is true?

- a. A probit or logit model should be used for corner solution outcomes, and a Poisson regression model should be used for a binary response.
- b. A Poisson regression model should be used for corner solution outcomes, and a probit or logit model should be used for a binary response.
- c. A probit or logit model should be used for count variables, and a Poisson regression model should be used for a binary response.
- d. A Poisson regression model should be used for count variables, and a probit or logit model should be used for a binary response.

ANSWER: d

RATIONALE: FEEDBACK: A Tobit model should be used for corner solution outcomes, a Poisson regression model should be used for count variables, and a probit or logit model should be used for a binary response.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Censored and Truncated Regression Models

KEYWORDS: Bloom's: Knowledge

15. Which of the following statements is true?

- a. OLS estimates in censored regression models are consistent estimators of the population coefficients.
- b. In a truncated regression model, the samples are not included randomly from an underlying population but are based on a given rule.
- c. In a censored regression model, units in the sample are taken from a particular subset of the population.
- d. Maximum likelihood estimators are consistent in truncated regression models even if there is nonnormality or heteroskedasticity in the error terms.

ANSWER: b

RATIONALE: FEEDBACK: In a truncated regression model, we do not have a random sample from the underlying population, but we know the rule that was used to include units in the sample. This rule is determined by whether the dependent variable is above or below a certain threshold.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Censored and Truncated Regression Models

KEYWORDS: Bloom's: Knowledge

16. Duration is a variable that measures:

- a. the time when a certain event occurs.
- b. the time before a certain event occurs.
- c. the time after a certain event occurs.
- d. the appropriate number of lags for a regression model.

ANSWER: b

RATIONALE: FEEDBACK: Duration is a variable that measures the time before a certain event occurs.

POINTS: 1

DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Censored and Truncated Regression Models
KEYWORDS: Bloom's: Knowledge

17. Which of the following statements is true?
- a. A truncated regression is a special case of a random sample selection.
 - b. Nonrandom sample selection can arise in cases of cross-sectional and time series data, but not in the case of panel data.
 - c. The Tobit regression model is based on endogenous sample selection.
 - d. The censored regression model is based on nonrandom sample selection.

ANSWER: c
RATIONALE: FEEDBACK: The Tobit regression model is based on endogenous sample selection.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Sample Selection Corrections
KEYWORDS: Bloom's: Knowledge

18. Which of the following is a method to correct for sample selection bias for the problem of incidental truncation?
- a. Vector error correction method
 - b. First differencing method
 - c. Heckman's method
 - d. Johansen method

ANSWER: c
RATIONALE: FEEDBACK: Heckman's method can be used for correcting sample selection bias for the problem of incidental truncation.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Sample Selection Corrections
KEYWORDS: Bloom's: Knowledge

19. The cumulative distribution function for a standard logistic random variable is a decreasing function.
- a. True
 - b. False

ANSWER: False
RATIONALE: FEEDBACK: The cumulative distribution function for a standard logistic random variable is an increasing function.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Logit and Probit Models for Binary Response
KEYWORDS: Bloom's: Knowledge

20. The likelihood ratio statistic is nonnegative.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The likelihood ratio statistic is nonnegative because $L_{ur} \geq L_r$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Logit and Probit Models for Binary Response

KEYWORDS: Bloom's: Knowledge

21. The Tobit model relies crucially on normality and heteroskedasticity in the underlying latent variable model.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: The Tobit model relies crucially on normality and homoskedasticity in the underlying latent variable model. Under heteroskedasticity, using a Tobit model is inefficient.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Tobit Model for Corner Solution Responses

KEYWORDS: Bloom's: Knowledge

22. The maximum likelihood estimates for Tobit models can be more easily obtained than the OLS estimates of a linear model.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: The maximum likelihood estimates for Tobit models can be more easily obtained than the OLS estimates of a linear model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Tobit Model for Corner Solution Responses

KEYWORDS: Bloom's: Knowledge

23. In the Poisson regression model, the probability distribution is given by $P(y = h|x) = \exp[-\exp(\mathbf{x}\hat{\mathbf{a}})][\exp(\mathbf{x}\hat{\mathbf{a}})]^h/h!$, $h = 0, 1, \dots$

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: In the Poisson regression model, the probability distribution is given by $P(y = h|x) = \exp[-\exp(\mathbf{x}\hat{\mathbf{a}})][\exp(\mathbf{x}\hat{\mathbf{a}})]^h/h!$, $h = 0, 1, \dots$

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: The Poisson Regression Model

KEYWORDS: Bloom's: Knowledge

24. When a variable is top coded, its value is known only up to a certain threshold.

- a. True
- b. False

ANSWER: True

RATIONALE: *FEEDBACK:* When a variable is top coded, its value is known only up to a certain threshold. For responses greater than the threshold, it is only known that the variable is at least as large as the threshold.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Censored and Truncated Regression Models

KEYWORDS: Bloom's: Knowledge

25. In case of endogenous sample selection, OLS is unbiased but consistent.

- a. True
- b. False

ANSWER: False

RATIONALE: *FEEDBACK:* In case of endogenous sample selection, OLS is biased and inconsistent.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Sample Selection Corrections

KEYWORDS: Bloom's: Knowledge

1. Let $\{(y_t, z_t): t = \dots, -2, -1, 0, 1, 2, \dots\}$ be a bivariate time series process. The model: $y_t = \alpha_0 + \delta_1 z_t + \delta_2 z_{t-1} + \delta_3 z_{t-2} + \dots + u_t$, where $t = \dots, -2, -1, 0, 1, 2, \dots$, represents a(n):
- moving average model.
 - ARIMA model.
 - finite distributed lag model.
 - infinite distributed lag model.

ANSWER: d

RATIONALE: FEEDBACK: The model: $y_t = \alpha_0 + \delta_1 z_t + \delta_2 z_{t-1} + \delta_3 z_{t-2} + \dots + u_t$, where $t = 0, 1, 2, \dots$, represents an infinite distributed lag model relating y_t to all current and past values of z .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Infinite Distributed Lag Models

KEYWORDS: Bloom's: Knowledge

2. The Koyck distributed lag model is an example of:
- a moving average model.
 - an autoregressive conditional heteroskedasticity model.
 - an infinite distributed lag model.
 - a finite distributed lag model.

ANSWER: c

RATIONALE: FEEDBACK: The Koyck distributed lag model is an example of an infinite distributed lag model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Infinite Distributed Lag Models

KEYWORDS: Bloom's: Knowledge

3. The model: $y_t = \alpha_0 + \gamma_0 z_t + \rho_1 y_{t-1} + \gamma_1 z_{t-1} + v_t$, where $v_t = u_t - \rho_1 u_{t-1}$ represents a:
- finite distributed lag model.
 - simultaneous equations model.
 - rational distributed lag model.
 - vector error correction model.

ANSWER: c

RATIONALE: FEEDBACK: The model: $y_t = \alpha_0 + \gamma_0 z_t + \rho_1 y_{t-1} + \gamma_1 z_{t-1} + v_t$, where $v_t = u_t - \rho_1 u_{t-1}$ represents a rational distributed lag model.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Infinite Distributed Lag Models

KEYWORDS: Bloom's: Knowledge

4. In the given AR(1) model, $y_t = \alpha_0 + \rho_1 y_{t-1}$, $t = 1, 2, \dots$, the Dickey-Fuller distribution refers to the:

- a. asymptotic distribution of the t statistic under the hypothesis $\rho - 1 = 0$.
- b. asymptotic distribution of the F statistic under the hypothesis $\rho - 1 = 0$.
- c. asymptotic distribution of the χ^2 statistic under the hypothesis $\rho - 1 = 0$.
- d. asymptotic distribution of the z statistic under the hypothesis $\rho - 1 = 0$.

ANSWER: a

RATIONALE: FEEDBACK: In the given model: $y_t = \alpha + \rho y_{t-1}$, $t = 1, 2, \dots$, the Dickey-Fuller distribution refers to the asymptotic distribution of the t statistic under the hypothesis $\rho - 1 = 0$.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Unit Roots

KEYWORDS: Bloom's: Knowledge

5. Which of the following is used to test whether a time series follows a unit root process?

- a. Wald test
- b. White test
- c. Augmented Dickey-Fuller test
- d. Johansen test

ANSWER: c

RATIONALE: FEEDBACK: The augmented Dickey-Fuller test can be used to check for unit root in a time series.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Testing for Unit Roots

KEYWORDS: Bloom's: Knowledge

6. A spurious correlation refers to a situation where:

- a. two variables are related through their correlation with a third variable.
- b. the correlation coefficient between two variables cannot be estimated.
- c. there is direct causal relationship between two variables but tests for correlations reject this relationship.
- d. the correlation between two variables is positive till the sample size reaches a threshold, and negative after the sample size crosses the threshold.

ANSWER: a

RATIONALE: FEEDBACK: A spurious correlation refers to a situation where two variables are related through their correlation with a third variable.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Spurious Regression

KEYWORDS: Bloom's: Knowledge

7. A spurious regression refers to a situation where:

- a. the direction of the relationship between the dependent variable and the explanatory variables is uncertain.
- b. even though two variables are independent, the OLS regression of one variable on the other indicates a relationship between them.

- c. a few important and necessary explanatory variables are left out of a regression equation, thus leading to inefficient and inconsistent forecasts.
- d. at least one of the variables used in a regression equation does not have a unit root and the error terms are heteroskedastic.

ANSWER: b

RATIONALE: FEEDBACK: A spurious regression refers to a situation where even though two variables are independent, the OLS regression of one variable on the other indicates a relationship between them.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Spurious Regression

KEYWORDS: Bloom's: Knowledge

8. Which of the following statements is true of spurious regressions?

- a. The OLS estimates of the population parameters are efficient and unbiased and the t statistic is valid.
- b. Even if the explanatory variables and the dependent variable are independent times series processes, the R^2 can be large.
- c. Spurious regressions are limited to $I(0)$ processes, and are not possible in case of $I(1)$ processes.
- d. Spurious regressions are limited to $I(1)$ processes, and are not possible in case of $I(0)$ processes.

ANSWER: b

RATIONALE: FEEDBACK: In case of a spurious regression, even if the explanatory variables and the dependent variable are independent times series processes, the R^2 can be large.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Spurious Regression

KEYWORDS: Bloom's: Knowledge

9. If two series have means that are not trending, a simple regression involving two independent $I(1)$ series will often result in a significant _____ statistic.

- a. F
- b. t
- c. z
- d. χ^2

ANSWER: b

RATIONALE: FEEDBACK: If two series have means that are not trending, a simple regression involving two independent $I(1)$ series will often result in a significant t statistic.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Spurious Regression

KEYWORDS: Bloom's: Knowledge

10. Two series are said to be cointegrated if:

- a. both series are $I(1)$ but a linear combination of them is $I(0)$.

- b. both series are $I(0)$ but a linear combination of them is $I(1)$.
- c. both series have the same set of explanatory variables but a different dependent variable.
- d. both series have the same dependent variable but a different set of explanatory variables.

ANSWER: b

RATIONALE: FEEDBACK: Two series are said to be cointegrated if both series are $I(0)$ but a linear combination of them is $I(1)$.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Cointegration and Error Correction Models

KEYWORDS: Bloom's: Knowledge

11. Which of the following tests can be used to check for cointegration between two series?

- a. Wald test
- b. Breush-Pagan test
- c. White test
- d. Engle-Granger test

ANSWER: d

RATIONALE: FEEDBACK: The Engle-Granger test can be used to check for cointegration between two series.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Cointegration and Error Correction Models

KEYWORDS: Bloom's: Knowledge

12. Which of the following statements is true?

- a. The calculated t statistic is valid and efficient in case of a spurious regression.
- b. If an explanatory variable or a dependent variable is integrated of the order one, the OLS estimators are asymptotically normally distributed.
- c. An error correction model can be used to study the short-run dynamics in the relationship between the dependent variable and the explanatory variables in a time series model.
- d. The Dickey-Fuller test can be used to test for heteroskedasticity in the error terms.

ANSWER: c

RATIONALE: FEEDBACK: An error correction model can be used to study the short-run dynamics in the relationship between the dependent variable and the explanatory variables.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Cointegration and Error Correction Models

KEYWORDS: Bloom's: Knowledge

13. If f_t denotes the forecast of y_{t+1} made at time t , then the forecast error is given by:

- a. $e_{t+1} = f_t / y_{t+1}$.
- b. $e_{t+1} = y_{t+1} / f_t$.
- c. $e_{t+1} = y_{t+1} + f_t$.

d. $e_{t+1} = y_{t+1} - f_t$.

ANSWER: d

RATIONALE: FEEDBACK: If f_t denotes the forecast of y_{t+1} made at time t , then the forecast error is given by $e_{t+1} = y_{t+1} - f_t$.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Forecasting

KEYWORDS: Bloom's: Knowledge

14. Which of the following is true of squared forecast errors?

- a. An error of +2 yields a greater loss than an error of -2.
- b. An error of -2 yields a greater loss than an error of +2.
- c. An error of -2 or +2 yields the same loss.
- d. Loss from positive and negative forecast errors cannot be compared.

ANSWER: c

RATIONALE: FEEDBACK: In case of squared forecast errors, an error of -2 or +2 yields the same loss.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: Forecasting

KEYWORDS: Bloom's: Application

15. Which of the following statements correctly identifies the difference between an autoregressive model and a vector autoregressive model?

- a. In an autoregressive model, the dependent variable is expressed as a function of its own lag, whereas in a vector autoregressive model, the dependent variable is expressed as a function of the lag of an explanatory variable.
- b. In an autoregressive model, the dependent variable is expressed as a function of the lag of an explanatory variable, whereas in a vector autoregressive model, the dependent variable is expressed as a function of its own lag.
- c. In an autoregressive model several series are modeled in terms of their own past, whereas in a vector autoregressive model only one series is modeled in terms of its own past.
- d. In an autoregressive model one series is modeled in terms of its own past, whereas in a vector autoregressive model several series are modeled in terms of their past.

ANSWER: d

RATIONALE: FEEDBACK: In an autoregressive model one series is modeled in terms of its own past, whereas in a vector autoregressive model several series are modeled in terms of their past.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Forecasting

KEYWORDS: Bloom's: Knowledge

16. In case of forecasts, the root mean squared error is the:

- a. average of the forecast errors divided by the variance of the errors.
- b. average of the absolute forecast errors.
- c. standard deviation of the forecast errors without any degrees of freedom adjustment.
- d. standard deviation of the forecast errors with a degrees of freedom adjustment.

ANSWER: c

RATIONALE: FEEDBACK: In case of forecasts, the root mean squared error is the standard deviation of the forecast errors without any degrees of freedom adjustment.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Forecasting

KEYWORDS: Bloom's: Knowledge

17. A process $\{y_t\}$ is a martingale if _____ is equal to y_t for all $t \geq 0$.

- a. $E(y_{t+1}|y_t, y_{t-1}, \dots, y_0)$
- b. $E(y_{t+1}|y_{t-1}, \dots, y_0)$
- c. $E(y_{t+1}, y_t|y_{t-1}, \dots, y_0)$
- d. $E(y_{t+1}, y_t|y_{t-1}, y_{t-2})$

ANSWER: a

RATIONALE: FEEDBACK: A process $\{y_t\}$ is a martingale if $E(y_{t+1}|y_t, y_{t-1}, \dots, y_0)$ is equal to y_t for all $t \geq 0$.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Forecasting

KEYWORDS: Bloom's: Knowledge

18. The value of the parameter α in the exponential smoothing method lies between _____.

- a. $-\infty$ and ∞
- b. -1 and 1
- c. 0 and 1
- d. 0 and ∞

ANSWER: c

RATIONALE: FEEDBACK: The value of the parameter α in the exponential smoothing method lies between 0 and 1.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Forecasting

KEYWORDS: Bloom's: Knowledge

19. The long-run propensity measures the long-run change in the expected value of y given a one-unit, permanent increase in z .

- a. True

b. False

ANSWER: True

RATIONALE: FEEDBACK: The long-run propensity measures the long-run change in the expected value of y given a one-unit, permanent increase in z .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Infinite Distributed Lag Models

KEYWORDS: Bloom's: Comprehension

20. If the t statistic for the presence of a unit root in a variable is -7.22 and the 5% critical value is -2.86 , there is strong evidence against a unit root in the variable.

a. True

b. False

ANSWER: True

RATIONALE: FEEDBACK: Since the absolute value of the t statistic for the presence of a unit root in a variable is greater than the absolute critical value, there is strong evidence against a unit root in the variable.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: Testing for Unit Roots

KEYWORDS: Bloom's: Application

21. The R^2 calculated in a spurious regression is a valid and efficient estimate of the goodness-of-fit of the regression equation.

a. True

b. False

ANSWER: False

RATIONALE: FEEDBACK: The R^2 calculated in a spurious regression is not a valid and efficient estimate of the goodness-of-fit of the regression equation as the calculated value can be very high even if there is no relationship between the dependent variable and the explanatory variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Spurious Regression

KEYWORDS: Bloom's: Knowledge

22. For 2.5% significance level, the asymptotic critical value for cointegration test with linear time trend is -3.59 .

a. True

b. False

ANSWER: False

RATIONALE: FEEDBACK: For 2.5% significance level, the asymptotic critical value for cointegration test with linear time trend is -4.03 .

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Cointegration and Error Correction Models
KEYWORDS: Bloom's: Comprehension

23. Exponential smoothing is a forecasting method where the weights on the lagged dependent variable decline to zero exponentially.

- a. True
- b. False

ANSWER: True

RATIONALE: **FEEDBACK:** Exponential smoothing is a forecasting method where the weight on the lagged dependent variable decline to zero exponentially.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Forecasting

KEYWORDS: Bloom's: Knowledge

24. In calculation of squared forecast errors, an error of +3 yields a loss three times greater than an error of -1.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** In calculation of squared forecast errors, an error of +3 yields a loss nine times an error of -1.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic - BUSPROG: Analytic

TOPICS: Forecasting

KEYWORDS: Bloom's: Application

25. Vector autoregressive models should be used for forecasting if the series being studied are cointegrated.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** Error correction models should be used for forecasting if the series being studied are cointegrated.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Forecasting

KEYWORDS: Bloom's: Knowledge

1. Which of the following is a characteristic of a good research question?
- A good research question should have policy implications.
 - A good research question should be constrained to macroeconomics.
 - A good research question should be backed by available information.
 - A good research question should be subjective and not objective.

ANSWER: c

RATIONALE: **FEEDBACK:** A good research question should be backed by available information in the form of data so that it can be answered.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Posing a Question

KEYWORDS: Bloom's: Knowledge

2. Which of the following is a characteristic of a good research paper?
- A good research paper should contain a review of relevant literature.
 - A good research paper should not have any published precedents.
 - A good research paper should always be useful for policy implications.
 - A good research paper should have more than one author.

ANSWER: a

RATIONALE: **FEEDBACK:** A good research paper should contain a review of relevant literature.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Literature Review

KEYWORDS: Bloom's: Knowledge

3. The most flexible way to obtain data in electronic form is as a standard _____ file.
- PDF
 - WMV
 - text (ASCII)
 - PPTX

ANSWER: c

RATIONALE: **FEEDBACK:** The most flexible way to obtain data in electronic form is as a standard text (ASCII) file.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Data Collection

KEYWORDS: Bloom's: Knowledge

4. Which of the following statements is true of an appropriate data set?
- An appropriate data set should be collected from government registered websites.
 - An appropriate data set should have enough controls to do a reasonable ceteris paribus analysis.
 - An appropriate data set should not have time series units.
 - An appropriate data set should not be based on surveys.

ANSWER: b
RATIONALE: FEEDBACK: An appropriate data set should have enough controls to do a reasonable ceteris paribus analysis.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Data Collection
KEYWORDS: Bloom's: Knowledge

5. Time series data should be stored:

- a. with the earliest time period listed as the first observation, and the most recent time period as the last observation.
- b. with the earliest time period listed as the last observation, and the most recent time period as the first observation.
- c. with the time period in which the concerned variable takes the highest value listed as the first observation, and the time period in which the concerned variable takes the lowest value as the last observation.
- d. with the time period in which the concerned variable takes the lowest value listed as the first observation, and the time period in which the concerned variable takes the highest value as the last observation.

ANSWER: a
RATIONALE: FEEDBACK: Time series data should be stored with the earliest time period listed as the first observation, and the most recent time period as the last observation.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Data Collection
KEYWORDS: Bloom's: Knowledge

6. Which of the following correctly identifies an advantage of entering data in a spreadsheet rather than a text file?

- a. Data in various websites is more often available as spreadsheets than as text files.
- b. Different observations are more likely to be run together in spreadsheets than in text files.
- c. Spreadsheets are readable on most computers, whereas text files are not.
- d. Spreadsheets allow manipulation of data, whereas text files do not.

ANSWER: d
RATIONALE: FEEDBACK: Spreadsheets allow manipulation of data such as calculation of averages, medians, etc. whereas text files do not.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Data Collection
KEYWORDS: Bloom's: Knowledge

7. Which of the following is the best approach to code the missing values in a data set?

- a. Indicate missing values with nonnumeric characters.
- b. Set any numerical codes for missing values to some other character.
- c. Enter 999 or -1 as the missing values.
- d. Do not enter any value.

ANSWER: b

RATIONALE: FEEDBACK: Set any numerical codes for missing values to some other character (such as a period) that cannot be mistaken for real data.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Data Collection
KEYWORDS: Bloom's: Knowledge

8. Which of the following statements is true?

- a. To carry out OLS estimation, it is necessary that the error terms should be correlated with the explanatory variables.
- b. Measurement error and simultaneity are potential sources of endogeneity.
- c. While entering data for a regression analysis, qualitative explanatory variables should be assigned numerical values.
- d. AR models are best suited for ordered responses.

ANSWER: b
RATIONALE: FEEDBACK: Measurement error and simultaneity are potential sources of endogeneity.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Econometric Analysis
KEYWORDS: Bloom's: Knowledge

9. Which of the following statements is true of stepwise regression?

- a. In a stepwise regression, the dependent variable is regressed on each independent variable individually with an attempt to understand the effect of each independent variable on the dependent variable.
- b. In a stepwise regression, the dependent variable is regressed on different combinations of the independent variable with an attempt to come up with the best model.
- c. In a stepwise regression, the dependent variable can take up binary values only while the explanatory variables can take up quantitative values.
- d. In a stepwise regression, the dependent variable can take up quantitative values while the explanatory variables can take up only binary values.

ANSWER: b
RATIONALE: FEEDBACK: In a stepwise regression, the dependent variable is regressed on different combinations of the independent variable with an attempt to come up with the best model.
POINTS: 1
DIFFICULTY: Moderate
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Econometric Analysis
KEYWORDS: Bloom's: Knowledge

10. The main assumption of OLS for any model is:

- a. to check whether the error term is uncorrelated with the response variable.
- b. to check whether the error term is correlated with the explanatory variables.
- c. to check whether the error term is uncorrelated with the explanatory variables.
- d. to check whether the error term is correlated with the response variable.

ANSWER: c

RATIONALE: FEEDBACK: The main assumption of OLS for any model is to check whether the error term is uncorrelated with the explanatory variables.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Econometric Analysis

KEYWORDS: Bloom's: Knowledge

11. Which of the following statements is true?

- a. Graphs should be avoided while introducing a research paper's topic.
- b. The introduction to a research paper should be longer than the conclusion to the research paper.
- c. The summary of a research paper can be presented in the introduction of a research paper.
- d. Statistics should be avoided in introductions for research papers.

ANSWER: c

RATIONALE: FEEDBACK: The summary of a research paper can be presented in the introduction of a research paper as it helps grab the reader's attention.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Writing an Empirical Paper

KEYWORDS: Bloom's: Knowledge

12. Which of the following statements is true?

- a. OLS is a model, whereas feasible GLS is an estimation method.
- b. OLS is an estimation method, whereas feasible GLS is a model.
- c. Both OLS and feasible GLS are models.
- d. Both OLS and feasible GLS are estimation methods.

ANSWER: d

RATIONALE: FEEDBACK: Both OLS and feasible GLS are methods to estimate models and not models by themselves.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Writing an Empirical Paper

KEYWORDS: Bloom's: Knowledge

13. Which of the following statements is true?

- a. A model shows the estimated parameters of the explanatory variables.
- b. A model represents a population relationship.
- c. In an empirical paper, the estimation methods should be discussed before specifying a model.
- d. The methods for estimating a model are same as the model itself.

ANSWER: b

RATIONALE: FEEDBACK: A model represents a population relationship.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Writing an Empirical Paper

KEYWORDS: Bloom's: Knowledge

14. Which of the following highlights a requirement of a good instrumental variable?

- a. It should be included in and endogenous to the equation of interest.
- b. It should be included in and exogenous to the equation of interest.
- c. It should be omitted from and exogenous to the equation of interest.
- d. It should be omitted from and endogenous to the equation of interest.

ANSWER: c

RATIONALE: **FEEDBACK:** For efficient estimation, a good instrumental variable should be omitted from and exogenous to the equation of interest.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Writing an Empirical Paper

KEYWORDS: Bloom's: Knowledge

15. Which of the following statements is true?

- a. If a model has several explanatory variables and several variations to the general model are to be presented, it is better to report the results in an equation form, rather than a tabular form.
- b. If a model has several explanatory variables and several variations to the general model are to be presented, it is better to report the results in a tabular form, rather than an equation form.
- c. The adjusted *R*-squared should always be listed in the result section of a research paper, while the *R*-squared may or may not be listed.
- d. The number of observations for each equation should always be listed in the result section of a research paper, while the *R*-squared may or may not be listed.

ANSWER: b

RATIONALE: **FEEDBACK:** If a model has several explanatory variables and several variations to the general model are to be presented, it is better to report the results in a tabular form, rather than an equation form.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Writing an Empirical Paper

KEYWORDS: Bloom's: Knowledge

16. Which of the followings statements is true?

- a. The title of a research paper should be mentioned only in the introduction section.
- b. The title page should not include any other information except the title of the research paper.
- c. Graphs and tables should be included in the main body only.
- d. All equations should begin on a new line and should be numbered consecutively.

ANSWER: d

RATIONALE: **FEEDBACK:** All equations used in a research paper should begin on a new line and should be numbered consecutively.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Writing an Empirical Paper

KEYWORDS: Bloom's: Knowledge

17. Which of the following statements is true?

- a. If standard errors are too large or too small, they should be reported in scientific notation.
- b. If coefficients are too large or too small, they should be reported in scientific notation.
- c. While reporting figures, the number of digits after decimals should be limited.
- d. The list of references used should be reported in the appendix.

ANSWER: c

RATIONALE: **FEEDBACK:** While reporting figures in research papers, the number of digits after decimals should be limited so as not to convey a false sense of precision.

POINTS: 1

DIFFICULTY: Moderate

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Writing an Empirical Paper

KEYWORDS: Bloom's: Knowledge

18. Which of the following is true of the "Introduction" section while writing a paper?

- a. It describes the general approach to answering the questions that have posed.
- b. It contains a few equations that one estimate and presents in the results section of the paper.
- c. It describes the data used in the empirical analysis.
- d. It states the basic objectives of the study and explains its importance.

ANSWER: d

RATIONALE: **FEEDBACK:** It states the basic objectives of the study and explains its importance.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Writing an Empirical Paper

KEYWORDS: Bloom's: Knowledge

19. A good research question should not be backed by time series data.

- a. True
- b. False

ANSWER: False

RATIONALE: **FEEDBACK:** A good research question can be backed by time series data. Most of the important macroeconomic researches are based on time series data.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Posing a Question

KEYWORDS: Bloom's: Knowledge

20. Econlit is an online search service which allows users to do a comprehensive search of almost all economics journals.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: Econlit is an online search service which allows users to do a comprehensive search of almost all economics journals.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Posing a Question

KEYWORDS: Bloom's: Knowledge

21. Historical data sets are available only in printed form.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: Historical data sets are available only in printed form.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Data Collection

KEYWORDS: Bloom's: Knowledge

22. The practice of data mining is consistent with the assumptions made in econometric analysis.

- a. True
- b. False

ANSWER: False

RATIONALE: FEEDBACK: The practice of data mining violates the assumptions on which econometric analysis is based.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Econometric Analysis

KEYWORDS: Bloom's: Knowledge

23. For panel data, it is best if all the years for each cross-sectional observation are adjacent and in chronological order.

- a. True
- b. False

ANSWER: True

RATIONALE: FEEDBACK: For panel data, it is best if all the years for each cross-sectional observation are adjacent and in chronological order.

POINTS: 1

DIFFICULTY: Easy

NATIONAL STANDARDS: United States - BUSPROG: Analytic

TOPICS: Data Collection

KEYWORDS: Bloom's: Knowledge

24. Instrumental variables can be used to solve misspecification errors related to omitted variables.

- a. True
- b. False

ANSWER: True
RATIONALE: FEEDBACK: Instrumental variables can be used to solve misspecification errors related to omitted variables.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Econometric Analysis
KEYWORDS: Bloom's: Knowledge

25. Sensitivity analysis is restricted to natural sciences.

- a. True
- b. False

ANSWER: False
RATIONALE: FEEDBACK: Sensitivity analysis can be used for social sciences as well.
POINTS: 1
DIFFICULTY: Easy
NATIONAL STANDARDS: United States - BUSPROG: Analytic
TOPICS: Econometric Analysis
KEYWORDS: Bloom's: Knowledge



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