



MANICALAND STATE UNIVERSITY OF APPLIED SCIENCES

FACULTY OF AGRIBUSINESS AND COMMERCE

DEPARTMENT OF AGRICULTURE ECONOMICS

AND

DEVELOPMENT

ECONOMETRICS I

CODE: AEDT 213

SESSIONAL EXAMINATIONS

AUGUST 2022

DURATION: 3 HOURS

EXAMINER: MR. N. JAMBO

INSTRUCTIONS

- 1. Answer ALL questions*
- 2. Be concise and clear*
- 3. Start a new question on a fresh page*
- 4. Total marks 100*

Additional Materials: Calculator

SECTION A

Section A consists of multiple-choice questions. Choose the correct answer.

1. In the regression function $y = \alpha + \beta x + \mu$,
 - a) x is the regressor
 - b) y is the regressor
 - c) x is the regressand
 - d) none of the above
2. The conditional mean of Y is
 - a) The expected value of Y for given values of the independent variables, X_i
 - b) The expected value of Y for given values of the independent variables, u_i .
 - c) The expected value of Y for given values of the independent variables, Y_i .
 - d) Both b and c
3. Information about numerical values of variables from period to period is
 - a) Time series data
 - b) Cross-section data
 - c) Panel data
 - d) Both a and b
4. Method of ordinary least square is attributed to
 - a) William Sealy Goss
 - b) Carl Friedrich Gauss
 - c) Durbin Watson
 - d) Both b and c
5. r^2 refers to
 - a) Coefficient of determination
 - b) Coefficient of correlation
 - c) Square of correlation coefficient
 - d) Both a and c
6. The coefficient of determination shows,
 - a) Variation in the dependent variable Y explained by the independent variable X
 - b) Variation in the independent variable Y explained by the dependent variable X .
 - c) Both a and b are correct
 - d) Both a and b are wrong
7. The violation of the assumption of constant variance of the residual is known as
 - a) Multicollinearity
 - b) Homoscedasticity
 - c) Autocorrelation
 - d) Heteroscedasticity
8. The term regression was coined by
 - a) Karl Pearson

- b) Carl Friedrich Gauss.
 - c) Francis Galton
 - d) William Sealy Goss
9. In $Y = \beta_1 + \beta_2 X + \mu_i$, the μ_i
- a) Represents the missing values of Y
 - b) Acts as proxy for all the omitted variables that may affect Y
 - c) Acts as proxy for important variable that affect Y
 - d) None of the above.
10. $Y_i = \beta_1 + \beta_2 X + \mu_i$, represents
- a) Sample regression function
 - b) Population regression function
 - c) Nonlinear regression function
 - d) Estimate of regression function
11. $\hat{Y}_i = \hat{\beta}_1 + \hat{\beta}_2 X + \hat{\mu}_i$, represents
- a) Sample regression function
 - b) Population regression function
 - c) Nonlinear regression function
 - d) Estimate of regression function
12. In $Y = \beta_1 + \beta_2 X + \mu_i$, the μ_i can take values that are
- a) Only positive
 - b) Only negative
 - c) Only zero
 - d) Positive, negative or zero
13. Formula for finding the coefficient of determination is
- a) $1 - \text{RSS}/\text{TSS}$
 - b) $1 + \text{RSS}/\text{TSS}$
 - c) $1 - \text{RSS}/\text{ESS}$
 - d) $1 + \text{RSS}/\text{ESS}$
14. Data on one or more variables collected at a given point of time is called:
- a) Time series data
 - b) Cross-section data
 - c) Panel data
 - d) Both a and b
15. The White's general test detects:
- a) Multicollinearity
 - b) Autocorrelation
 - c) Heteroscedasticity
 - d) None of the above

SECTION B

QUESTION 1

- a) Define econometrics [2]
- b) Explain any three aims of econometrics. [6]
- c) Distinguish between an economic model and an econometric model. [8]
- d) Explain the following types of data, giving examples:
 - i. Cross-sectional data [3]
 - ii. Time-series data [3]
 - iii. Panel data [3]

QUESTION 2

- a) Define a binary variable [2]
- b) Give three (3) examples of economic decisions in which the observed outcome is a binary variable. [3]
- c) State and discuss any five assumptions of the simple linear regression model [10]

QUESTION 3

Explain the classical or traditional methodology of econometrics [20]

QUESTION 4

The following data relates to the sales and profit of AgriWorld company in Zimbabwe over 5 years.

Time in years	1	2	3	4	5
X	10	20	30	40	50
Y	2	3	5	7	8

Suppose X represents the sales in \$.000's and Y represents the profit in \$.000's.

- a) Compute the sample correlation coefficient (r) between sales and profit. [10]
- b) Interpret the value of the correlation coefficient. [1]
- c) Calculate the coefficient of determination and interpret your answer. [4]
- d) Develop the estimated regression equation using the least squares method for these data on sales on sales and profit. [6]
- e) Interpret the estimated coefficients (β_0 and β_1). [4]

END OF EXAMINATION

FORMULAE

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$\hat{\beta}_1 = \frac{\sum xy}{\sum x^2}$$

$$\hat{\beta}_0 = \bar{Y} - \hat{\beta}_1 \bar{X}$$