



SUPP. 2016/2017

UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

PROGRAMME: B.Sc. in Agricultural Economics and Agribusiness Management  
Year 3

COURSE CODE: AEM 302

TITLE OF PAPER: INTRODUCTION TO ECONOMETRICS

TIME ALLOWED: TWO (2) HOURS

INSTRUCTION: 1. ANSWER ALL QUESTIONS  
2. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS

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**QUESTION 1**

- i. Why do we need regression analysis? Why not simply use the mean value of the regressand as its best value? **[ 9 MARKS]**
- ii. Briefly explain the purpose of including an error term in a regression equation. **[6 MARKS]**
- iii. What is the conditional expectation function or the population regression function? **[ 4 MARKS]**
- iv. What is the difference between the population and sample regression functions? Is this a distinction without difference? **[6 MARKS]**

**QUESTION 2**

Suppose that a researcher wants to estimate the following model:

$$y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \varepsilon_i$$

Where  $y_i$  = dependent variable,  $x_1$  and  $x_2$  are the explanatory variables, and  $\varepsilon_i$  is an error term. Suppose that  $x_1$  and  $x_2$  are deterministically related according to  $x_1 = \sqrt{x_2}$ .

- i. Is multicollinearity a threat in estimating the model? **[15 MARKS]**
- ii. What would be the consequence of omitting  $x_2$  in the original regression model anyway? **[ 10 MARKS]**



**QUESTION 3**

Consider the following regression output;

$$\hat{Y}_i = 0.2033 + 0.6560X_i$$

$$\text{Standard errors} = (0.0976) \quad (0.196)$$

$$r^2 = 0.397$$

$$t_\alpha = 1.740 \text{ at } 5\%$$

Where  $Y$  = labor force participation rate (LFPR) of women in 1972 and  $X$  = LFPR of women in 1968. The regression results were obtained from a sample of 19 cities in the United States.

- i. How do you interpret this regression? [10 MARKS]
- ii. Test the hypothesis:  $H_0: \beta_2 = 1$  against  $H_1: \beta_2 > 1$ . Which test do you use? And why? What are the underlying assumptions of the test(s) you use? [15 MARKS]

**QUESTION 4**

Regression through the origin. Consider the following regression through the origin:

$$Y_i = \beta_2 X_{2i} + \beta_3 X_{3i} + \mu_i$$

- i. How would you go about estimating the Unknowns? [10 MARKS]
- ii. Will  $\sum \hat{\mu}_i = 0$  for this model? Why or why not? [5 MARKS]
- iii. Will  $\sum \hat{\mu}_i X_{2i} = \sum \hat{\mu}_i X_{3i} = 0$  for this model? [5 MARKS]
- iv. When would you use such a model? [5 MARKS]