KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2010/2011

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE IN AGRIBUSINESS MANAGEMENT AND TRADE

KBT 503: ECONOMICS

DATE: Friday, 1st APril 2011 **TIME: 9.00 a.m. –12.00 p.m.**

INSTRUCTIONS

1. Be sure your **student number and other details specified** are printed clearly on the front of all exam booklets used.
2. **Please label clearly** each of your answers in the exam booklets with the appropriate number and letter.
3. **Please write legibly.**

Answer question 1) and any other three.

1. This question has five Parts. Answer ALL the parts. [25 Marks]
   i. What is regression analysis? What is correlation analysis?
   ii. What are the two different ways in which the term *linear* in the Classical Linear Regression Model (CLRM) could be interpreted? Which of the two interpretations is relevant for the development of the regression theory presented in this course?
   iii. What are three limitations of the Linear Probability Model (LPM)? How are these limitations overcome in econometric analyses?
   iv. Using the following regression output:

$$
\begin{array}{llllll}
Y & = -16.06 & + 4.146X_1 & - 0.236X_2 & + 4.831X_3 \\
\text{StDev} & = (19.07) & (0.751) & (0.881) & (0.901) \\
\text{t-ratio} & = (-0.842) & (5.521) & (-0.268) & (5.362)
\end{array}
$$

   Interpret the coefficients. Test the coefficients using a relevant test statistic.
   v. State the Gauss-Markov Theorem. What three properties hold for an OLS estimator to be said to be best linear unbiased estimator (BLUE)?

2. The disturbance term u_i is a surrogate for all those variables that are omitted from the regression model but that collectively affect Y (dependent variable). Identify five reasons and briefly explain why these omitted variables are not introduced into the regression model explicitly. [15 Marks]

3. Consider the following regression results for the Economy of country A for the period 1968-1987 (Y = Expenditure on imported goods and X = personal disposable income, both measured in billions of 1982 dollars): [15 Marks]

$$Y_t = -261.09 + 0.2453X_t$$

Se = (31.327) (   ) $r^2 = 0.9388$
t = (   ) (16.616)   n = 20

a) Fill in the missing numbers
b) How do you interpret the coefficient 0.2453? And the coefficient -261.09?
c) Would you reject the hypothesis that the true slope coefficient is zero? Which test do you use? And Why? What is the ρ value of your test statistic?

4. What is multicollinearity? What are the practical consequences of multicollinearity? How does one detect multicollinearity? What remedial measures can be taken to alleviate the problem of multicollinearity? [15 Marks]

5. What is heteroscedasticity? What are the consequences of heteroscedasticity? How does one detect heteroscedasticity? What are the remedial measures? [15 Marks]

6. You have been commissioned to investigate the relationship between the median selling prices of houses and the average number of rooms per house in 506 districts of a large metropolitan area. The dependent variable is **price$_i$**, the median selling price of a house in the i-th census district, measured in *thousands of dollars*. The explanatory variable is **rooms$_i$**, the average number of rooms per house in the i-th census district. The model you propose to estimate is given by the population regression equation [15 Marks]

   Price$_i$ $= \beta_1 + \beta_2$ rooms$_i$ + u_i

   Your research assistant has used the 506 sample observations on price$_i$ and rooms$_i$ to estimate the following OLS sample regression equation, where the figures in parentheses below the coefficient estimates are the estimated standard errors of the coefficient estimates:

   Price$_i$ = -347.96 + 91.1955 rooms$_i$ + u_i
   Std errors (26.52) (4.193)   N = 506

   a) Compute the two-sided 95% confidence interval for the slope coefficient β_2.
   b) Perform a test of the null hypothesis H_0: $\beta 2 = 0$ against the alternative hypothesis H_1: $\beta_2 \neq 0$ at the 1% significance level (i.e., for significance level $\alpha = 0.01$). Show how you calculated the test statistic. State the decision rule you use, and the inference you would draw from the test. Briefly indicate the conclusion you would draw from the test.