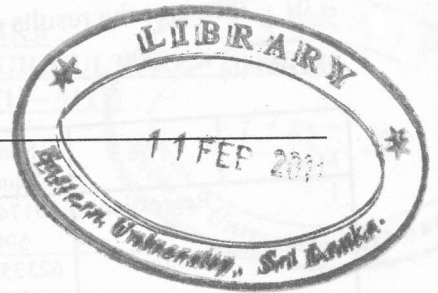


EASTERN UNIVERSITY, SRI LANKA  
FOURTH YEAR SECOND SEMESTER EXAMINATION IN AGRICULTURE – 2008/2009  
AEC 4105 – BASIC ECONOMETRICS

Answer ALL questions

Time: Two hour (02)



01)

- a) Define the following variables:
- Dependent variable
  - Independent variable
- b) Define the following assumptions of the multiple regression model:
- Heteroscedasticity
  - Autocorrelation
  - Normality

02)

- a) list three different applicable examples where quantitative methods are applied in economics.
- b) A researcher has 100 observations of  $Y$ ,  $X_1$ ,  $X_2$  and  $X_3$ . She uses MLR (Multiple Linear Regressions) to create a dependent factor of  $Y$  using  $X_1$ ,  $X_2$  and  $X_3$  as predictors. The regression equation is  $Y = 22.0 - 2.04 X_1 + 0.3 X_2 + 0.78 X_3$ . The researcher now notices that the first number in  $X_3$  should have been 16 instead of 6, so he changes only that number and re-fits the model. Now the regression equation is  $Y = 22 - 2.04 X_1 + 3.09 X_2 - 0.008 X_3$ . The researcher assumed MLR assumption violation behind this data set by looking at the two results.

Answer the following:

- What may be the cause/violation of this data set?
- Comment on the properties of the estimators of the above models?
- Give one reason for the above violation in regression models?
- How this researcher will handle/overcome the above situation?

03) Using the SPSS output tables for a defined analysis given below, answer the following:

a) Name the analysis done to generate this output,

b) Interpret the results obtained.

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	191747559	1	19174755959	48.302	0.000(a)
	Residual	599.768		9.768		
		623253814	157	3969769518.2		
		359.232		12		
	Total	815001373	158			
		959.001				

a Predictors: (Constant), AGLAND

b Dependent Variable: farm income

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3870.379	9976.521		0.388	0.699
	AGLAND	4831.818	695.230	.485	6.950	.000

a Dependent Variable: farm income

04)

a) The output table for a multiple regression analysis is given below. Answer the following questions based on the results.

Independent variables	Coefficients	Standard error	t-value	Sig.
Education of household head	0.022*	0.011	1.992	0.049
Age of household head	-0.003	0.004	-0.638	0.525
Young is to adult ratio	-0.063	0.047	-1.337	0.184
Diversity index	0.013	0.022	0.608	0.545
Sex of household	0.241*	0.079	3.069	0.003
Constant	3.515*	0.262	13.42	0.000

Number of observations: 97, R-Square: .344 (Prob>F), Adjusted R-Square: .300

Regression mean square > residual mean square (.838 > .107)

Dependent variable: Household income

\*Significant at 5% level (P< 0.05)

(Note: Coding given for sex of household head during data entry female: 0, male: 1)

- I. Interpret the  $R^2$  value of this output.
- II. Write down the estimated equation for the above output.
- III. Interpret the relationship between the dependent and predictors of this output.