



MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

FOURTH YEAR SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF ECONOMICS AND STATISTICS

BACHELOR OF ECONOMICS

BMS 404: ECONOMETRIC MODELING AND METHODS

DATE:

TIME:

INSTRUCTIONS: Answer Question ONE and any other TWO questions

QUESTION ONE (COMPULSORY 30 MARKS)

- a) Explain the term economic modeling. (2 marks)
- b) State five critical features of an economic model (5 marks)
- c) Briefly explain four types of economic models (8 marks)
- d) Explain briefly six ways that one can use to evaluate the quality of the regression estimates of the model (6 marks)
- e) The national income model for an economy is represented as follows (units are in millions of shillings)

$$Y = C + I + G + X - M$$

$$C = 200 + 0.6Y$$

$$I = 240$$

$$G = 800$$

$$X = 600$$

$$M = 400 + 0.4Y$$

where: Y = National income

C = consumption expenditure

I = Investment expenditure

G = government expenditure

X = exports

M = Imports

Find the equilibrium values of the endogenous variables (Y, C and M) in the model

(9 marks)

QUESTION TWO (20 MARKS)

A researcher wanted to find out the relationship between firms' monthly sales of cars and their expenditure on advertisement. He sampled ten car selling firms and recorded their monthly sales and expenditure on advertisement in thousands of Kenya Shillings as follows:

Firms	A	B	C	D	E	F	G	H	I	J
Sales	85	52	72	62	48	68	45	76	55	42
Advertisement	45	25	35	30	22	38	24	37	28	20

- i) Using regression analysis, obtain the sales function (10 marks)
- ii) Compute the coefficient of determination and interpret it. (5 marks)
- iii) Estimate the expenditure on advertisement for a firm whose monthly sales is 90 cars. (5 marks)

QUESTION THREE (20MARKS)

A research firm intends to conduct a market survey to determine factors influencing of milk by daily farmers in a certain region. The firm will have to build an appropriate economic model to estimate the supply.

- a) Briefly explain the steps that should be followed to develop this economic model (10 marks)
- b) Explain five criteria for judging the validity of such a model (5 marks)
- c) Describe five uses of such an economic model (5 marks)

QUESTION FOUR (20MARKS)

Ellos ltd sells mobile phones in a certain city. The firm intends to launch a new model of phones in the market.

- a) Briefly explain on the basis of an economic theory five factors that would influence the demand for the new model. (10 marks)
- b) The quantity of the new model of phones bought at different shops in the city were recorded as follows.

Price	1,300	1,000	1,500	1,150	1,200	1,400
No. of phones	200	300	180	225	250	160

Determine the demand function and coefficient of determination and interpret them.

(10 marks)

QUESTION FIVE (20MARKS)

Consider the following set of results generated in STATA which concerns an analysis of the relationship among poverty (i.e. proportion of population below the poverty line), age-dependency ratio (agedepratio), average household size (hhsz) and proportion of households with a member with university degree (graduate). The objective is to regress poverty on the other variables.

Correlation results: pwcorr poverty agedep~o hhsz graduate, star(5)

	poverty	agedep~o	hhsz	graduate
poverty	1.0000			
agedepratio	0.6174*	1.0000		
hhsz	0.6050*	0.4390*	1.0000	
graduate	-0.6883*	-0.7870*	-0.5154*	1.0000

Multiple regression results: reg poverty agedepratio hhsz graduate

Source	SS	df	MS	Number of obs	=	44
				F(3, 40)	=	17.67
Model	6298.71728	3	2099.57243	Prob > F	=	0.0000
Residual	4753.15268	40	118.828817	R-squared	=	0.5699
				Adj R-squared	=	0.5377
Total	11051.87	43	257.020232	Root MSE	=	10.901
Poverty	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
agedepratio	0.1516111	0.1503072	1.01	0.319	-0.152171	0.4553932
hhsz	6.187152	2.252183	2.75	0.009	1.63532	10.73898
graduate	-1.77889	0.8203311	-2.17	-2.17	-3.436841	-1.209389
cons	20.62111	25.56289	0.81	0.425	-31.04341	72.28564

Required:

- Write down the econometric and the fitted regression equations
(2 marks)
- Interpret the correlation coefficients among the variables
(4 marks)
- Discuss the regression results above in terms of the economic and statistical significance of the estimated coefficients of the model
(10 marks)
- Evaluate the model on the basis of the F-test and R-squared. For each test, first state the hypothesis being tested
(4 marks)