



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2017/2018
DIGITAL SCHOOL OF VIRTUAL AND OPEN LEARNING
SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
ECONOMICS

EES 401: FUNDAMENTALS OF ECONOMETRICS II

DATE: FRIDAY 22ND JUNE 2018

TIME: 2.00 P.M. - 4.00 P.M.

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

You are given the following information on 16 employees of a particular company:

Monthly salary (000's ksh)	Gender	Specialization
38	F	MBA
31	M	MBA
19	M	ECON
28	F	ECON
33	M	MBA
23	F	ECON
33	F	ECON
32	F	MBA
27	M	ECON
36	M	MBA
20	M	ECON
36	F	ECON
25	M	ECON
27	M	MBA
41	F	MBA
28	M	ECON

Where F = Female and M = Male

- a) Regress monthly salary on gender and specialization assuming that: female = 1, otherwise 0 and econ = 1, otherwise 0. (12 marks)
- b) Derive the variance-covariance matrix of the above data and specify the standard errors of the regression coefficients (6 marks)
- c) Test for the statistical significance of each coefficient in the model, assuming a 5% level of significance. use $t = 2.179$ (6 marks)
- d) Find the expected salary of a female who specialized in economics (2 marks)
- e) State the steps in the chow test for dummy variable analysis test for stability (4 marks)

QUESTION TWO (20 MARKS)

- a) Distinguish between univariate and multivariate time series analysis (2 marks)
- b) What is the difference between AR, MA, ARMA and ARIMA models in time series analysis (6 marks)
- c) Analyze the two problems and the two remedial measures for non stationary time series data (4 marks)
- d) State the characteristics of an integrated series (4 marks)
- e) Give two reasons why the logit and probit models are superior to the LPM when estimating dummy dependent variable models (4 marks)

QUESTION THREE (20 MARKS)

- a) Given the following set of simultaneous equations

$$P = \alpha_1 R + \varepsilon_1$$

$$Q = \alpha_2 R + \beta_1 X + \varepsilon_2$$

$$R = \alpha_3 P + \alpha_4 Q + \beta_2 Y + \varepsilon_3$$

Show whether the equations are identified, over identified or not identified (6 marks)

- b) Specify the four steps in the augmented dickey fuller test (4 marks)

c) The results of these regressions are now summarized in the following table:

Dependent variable (grade)		Logit model	Probit model
Gpa	Coefficient	2.8261	1.6258
	p-value	0.025	0.019
	Slope	0.5339	0.5333
Tuce	Coefficient	0.0952	0.0517
	p-value	0.501	0.537
	Slope	0.0180	0.0170
Psi	Coefficient	2.3787	1.4263
	p-value	0.025	0.017
	Slope	0.4565	0.4644
constant	Coefficient	-13.0214	-7.4523
	p-value	0.008	0.003
	R-squared	0.3740	0.3775
Predicted probability		0.2528	0.2658

Interpret the results of the logit and probit models as presented above

(10 marks)

QUESTION FOUR (20 MARKS)

a) From the model

Demand function: $X_t = \omega_0 + \omega_1 F_t + \omega_2 L_t + \varepsilon_{1t}$ $\omega_1 < 0, \omega_2 > 0$

Supply function: $X_t = \chi_0 + \chi_1 F_t + \chi_2 F_{t-1} + \varepsilon_{2t}$ $\chi_1 > 0, \chi_2 > 0$

Derive the reduced form equation of the model.

(6 marks)

b) Compare and contrast between the following:

- (i) balanced and unbalanced panel (2 marks)
- (ii) fixed effects and random effects (2 marks)
- (iii) cross section data and time series data models (2 marks)

- c) Discuss the steps used in estimating panel data models using fixed effects model (4 marks)
- d) What are the properties of the error term in a random effects model? (4 marks)

QUESTION FIVE (20 MARKS)

Consider the following simple Keynesian model of national income determination:

Consumption function: $C_t = a_0 + a_1 Y_t + a_2 C_{t-1} + u_1$

Investment function: $I_t = b_0 + b_1 Y_{t-1} + b_2 Y_t + u_2$

Income identity: $Y_t = C_t + I_t + G_t$

Where G_t is the level of government expenditure, and Y_{t-1} and C_{t-1} is lagged income and lagged consumption respectively

- a) identify the endogenous and exogenous variables respectively (2 marks)
- b) using the order and the rank conditions, examine the identification status of the consumption function (6 marks)
- c) why is identification of equations important (2 marks)
- d) from the structural equations given above, derive the reduced form equations and show the relationship between them (10 marks)
