KABARAK UNIVERSITY

UNIVERSITY EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF SCIENCE IN ECONOMICS AND MATHEMATICS

COURSE CODE: ECON 312

COURSE TITLE: ECONOMETRICS I

STREAM: Y3S2

DAY: MONDAY

TIME: 11.00 – 1.00 P.M.

DATE: 4/8/2008

INSTRUCTIONS:

1. Answer **QUESTION ONE** and any other **TWO** questions.

2. Question **ONE** carries **30 marks** and the rest **20 marks each.**

3. Show all your workings clearly.

PLEASE TURN OVER

QUESTION ONE

(a)   (i)   Define the term econometrics.

       (ii)   Explain how Econometrics is different from econometric theory, mathematical economics and economic statistics.

(b)   Explain in detail the general assumptions underlying the simple classical linear regression model.

(c)   Explain the steps that constitute an Econometric research methodology.

(d)   The following data relates to quantity demanded (Q) and the price (P) of beans in a rural market.

Q	47	30	22	44	64	55
P	8	10	13	9	6	5

      (i)   Specify and estimate the demand for beans

      (ii)   Calculate the coefficient of determination

      (iii)   Interpret your results in (i) and (ii) above.

      (iv)   Compute the average force elasticity of demand and price elasticity of demand when the price of beans is Ksh.10.

      (v)   Test the hypothesis that the slope coefficient of the estimated model in d (i) is statistically significant at 5%.

QUESTION TWO

Given the data on the explanatory variables X_t and the estimated residuals, e_t as;

x_t	e_t
6	443
7	167
8	-53
9	-271
10	-256
11	-86
12	-175
13	-35
14	-42
15	266

16	13
17	-21
18	-53
19	-31
20	72
21	-147
22	-53
23	-63
24	205
25	122

(a)   Test for autocorrelation using Durbin-Watson test (Use $K´ = 3$ at 5% level of significance)

(b)   Explain the consequences of autocorrelation on Parameter estimates.

(c)   Outline the factors that give rise to autocorrelation.

QUESTION THREE

(a)   (i)   explain the role of the disturbance term in an econometric model.

(ii)   Explain the desirable properties of the ordinary least squares (OLS) estimator.

(iii)   Outline any three uses of econometrics in economic analysis.

(3mks)

(b)   Consider the following simple classical linear regression model.

$$Y_i = \propto_0 + \propto_1 x_1 + \varepsilon_i$$

Derive the ordinary least squares estimators $\hat{\propto}_0$ and $\hat{\propto}_1$ for the above specified model.

QUESTION FOUR

(a)   Distinguish the following pairs of concepts

(i)   Multicollinearity and Autocorrelation   **(2mks)**

(ii)   Heteroscedasticity and Homoscedasticity   **(2mks)**

(iii)   Mathematical economic model and Econometric model   **(2mks)**

(b)   Explain in detail the consequences of multicollinearity in an econometric model

(c)   An economics student wanted to investigate the effects wealth (W) on assumption (C). Using a sample of nine (9) the student came up with the following intermediate results in real values.

$$\sum c = 1052 \quad \sum w = 1017 \quad \sum wc = 119750$$
$$\sum w^2 = 115571$$

(i)   Specify a regression model for the above data set.

(ii)   Estimate the model in (i) above and interpret your results on a priori ground.

QUESTION FIVE

(a)   The time series data shown below represent the total cost (TC) and the total level of output (Q) of a dairy plant in an urban area from 1998 to 2007

Year	Packets of milk (Q)	Total cost (TC) (Kf)
1998	40	150
1999	42	140
2000	48	160
2001	55	170
2002	65	150
2003	79	162
2004	88	185
2005	100	165
2006	120	190
2007	140	185

(i)   Test the null hypothesis that the TC and Q of the plant are directly related by estimating the cost function
$$TC = c_0 + c_1 Q + \varepsilon \qquad \textbf{(12mks)}$$

(ii)   Interpret the estimated parameters   **(3mks)**

(b)   Explain the Bunch Map analysis test for multicollinearity   **(5mks)**