

CHUKA



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**EXAMINATION FOR THE AWARD OF DEGREE OF
MASTER OF SCIENCE IN AGRICULTURAL ECONOMICS**

AGEC 851: ECONOMETRIC METHODS

STREAMS: MSC (AGEC)

TIME: 3 HOURS

DAY/DATE: MONDAY 05/08/2019

2.30 PM – 5.30 PM

INSTRUCTIONS:

Answer Question One and any other Two Questions

Question One

(a) Econometrics is the application of mathematical statistics to economic data to lend empirical support to models. Discuss in details the traditional econometric methodology. [10 marks]

(b) (i) Explain the general procedure of hypothesis testing. [4 marks]

(ii) Two drugs were tried on certain patients for reducing weight. 5 persons were given drug A and 7 drug B. the data in weight reduction is given below

Drug A	8	12	16	9	3		
Drug B	10	8	12	5	6	8	11

Test whether there is a significant difference in weight loss due to the drugs at 5% significance level. [8 marks]

(c) An estimator is any given quantity calculated from the sample which is used to give information about the population. Discuss the qualities of a good estimator. [8 marks]

Question Two

- (a) (i) Given the following function , derive the ordinary least square estimators of β_1 and β_2 . [10 marks]
 (ii) The output of wheat depends on fertilizer and pesticide use. The data below shows the output of wheat at different levels of fertilizer and pesticide use.

Year	1917	1972	1973	1974	1975	1976	1977	1978	1979	1980
Output of wheat	40	44	46	48	52	58	60	68	74	80
Fertilizer input	6	10	12	14	16	18	22	24	26	32
Insecticide input	4	4	5	7	9	12	14	20	21	24

Required:

- (i) Estimate the regression equation of wheat on fertilizer and pesticide use. [4 marks]
 (ii) Test the statistical significance of fertilizer and pesticide elasticities. [4 marks]
 (iii) Test the goodness of fit of the model [2 marks]

Question Three

- (a) (i) Discuss the types of data available for empirical analysis. [3 marks]
 (ii) A sample of employees at a certain firm had the opinion about a new pension plan being surveyed. The results were as shown below

Age	Superior	Very good	Good	Fair	Satisfactory
20 – 30	19	27	25	52	81
30 – 40	10	17	15	29	41
40 – 50	51	40	31	21	27
50 and above	142	81	16	9	8

Is there any relationship between age and the employees opinion of the new plan at 5% level of significance? [10 marks]

- (b) (i) Distinguish between autoregressive and moving averages Time series models using examples [2 marks]
 (ii) Discuss the methods used to test stationarity of time series data. [5 marks]

Question Four

(a) (i) Determine whether or not the following 2 equations satisfy the order condition for identification. [4 marks]

(ii) Given the following structural macroeconomic equations

Determine the reduced form equations of M_t and Y_t . [4 marks]

(iii) Examine the state of identification of the first 3 equations in the following model [6 marks]

(b) Multicollinearity is the general intercorrelation among explanatory variables and it presents difficulties when correlation is very high. Discuss the remedial measures for multicollinearity. [6 marks]
