CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF MASTER OF SCIENCE IN ECONOMICS

MSEC 833: ECONOMETRICS II

STREAMS: MSC **TIME: 3 HOURS**

DAY/DATE: FRIDAY 8/12/2017 **2.30 P.M - 5.30 P.M.**

INSTRUCTIONS:

- **Answer Question ONE and any other THREE from the remaining.**

QUESTION ONE

(a) Define the components which make up an ARIMA Model. [5 Marks]

(b) Why is decomposition fundamental to time series modelling. [5 Marks]

(c) Outline the Box-Jenkins identification methodology. [5 Marks]

(d) Define the exponentially weighted moving average time series forecasting approach and give examples commonly used versions of this model. [5 Marks]

QUESTION TWO

(a) Explain the problems of spurious regression and relate it to the question of stationarity of the data. [5 Marks]

(b) Define the terms stationary, non-stationary and integrated series. [5 Marks]

(c) How would you test for stationarity? [5 Marks]

(d) When does non-stationary data not give rise to the problems of a spurious regression. [5 Marks]

QUESTION THREE

Suppose both X and Y are I(1) variables which are generated by the following true system

$$X_t = a + bY_t + e_t$$

$$Y_t = Y_{t-1} + V_t$$

Where e_t and V_t are stationary error processes.

(a) Define the common stochastic trend underlying this model. [3 Marks]

(b) What is the co integrating vector. [5 Marks]

(c) Explain the relationship between the number of co integrating vectors in a system and the number of stochastic trends. [5 Marks]

(d) What are the properties of the OLS estimate of the parameter b? How do these properties vary from that of a spurious regression? [5 Marks]

(e) How would you assess the possibility that two series such as X_t and Y_t actually do co integrate. [2 Marks]

QUESTION FOUR

(a) What is the main purpose of time series forecasting in contrast to mainstream econometrics. [5 Marks]

(b) Outline the two basic structures that form the building blocks of time series modeling. [5 Marks]

(c) How is non-stationarity usually handled in this framework? [10 Marks]

QUESTION FIVE

The following table of test results has been derived for a system of 5 variables using the Johansen Maximum likelihood procedure.

r	**Trace Test**	**5% critical value**	**Lambda max test**	**5% critical value**
1.	15.4	8.08	11.1	8.1
2.	24.1	17.8	17.3	14.6
3.	29.1	31.2	19.2	21.3
4.	33.4	48.4	24.1	27.3
5.	37.3	69.9	26.7	33.2

(a) Interpret the two tests. What is co integrating rank of the system? [5 Marks]

(b) Outline the order condition four identifying co integrating vectors and illustrate it with an example of identifying a system with 2 co integrating vectors. [5 Marks]

(c) If there were no theoretical restrictions available than were needed for identification, how could this situation be used to test the theory being applied? [10 Marks]

QUESTION SIX

(a) Define the term weak stationarity, integrated order one and uniform mixing. How would you assess the stationarity of a variable X. [5 Marks]

(b) Suppose X was the US stock market index and your data period was from 1920-1938 (to include stock market crash). How would the testing procedure for stationarity be affected? [5 Marks]

(c) If both the Dollar/sterling exchange rate (E) and the Yen/Dollar exchange rate (Y) were I (1) but there was in fact no relationship between the two variables, what would you expect the result would be of performing the following regression? [10 Marks]

$$E_t = a + b\,Y_t + V_t$$

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