

**UNIVERSITY OF NAIROBI**  
**SCHOOL OF BUSINESS**  
**DEPARTMENT OF FINANCE AND ACCOUNTING**  
**MSC (FINANCE) DEGREE PRPGRAM**  
**DFI 611: FINANCIAL ECONOMETRICS AND MODELLING**

**Instructions**

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

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**QUESTION ONE**

- i. Outline six steps involved in formulating an econometric model (12mks)
- ii. Suppose that a lending rate influences profitability of commercial banks in Uganda.

Use the regression below to answer the questions that follow:

$$\text{Profitability} = -44.73 + 0.7\text{Lendingrate}, R \text{ square} = 0.81$$

$$SE(\beta_0) = 0.97, SE(\beta_1) = 0.58, \text{SE denotes standard error}$$

- a) State the hypotheses (4mks)
- b) Conduct the t-test (4mks)
- c) Test whether or not the estimated coefficient of “Lending Rate” is statistically significant at 5% significance level (the critical value for the t-test at 5% significance level is 1.96) (4mks).
- d) Interpret the results (2mks)
- e) What does “R-squared=0.81” mean? (2mks)
- f) If lending rate is 18, what is the estimated profitability (Profitability is measured in USD)? (2mks)

**QUESTION TWO**

- i. Explain how you would remedy severe multicollinearity in your financial data (6mks).
- ii. With the aid of equations, explain the difference between a stochastic and a deterministic relationship (4mks)

### QUESTION THREE

- i. Explain the difference between cross-sectional data and time series data. Give examples of each (4mks)
- ii. Suppose you want to test the null hypothesis that  $\beta_2$  is equal to 0.3 against the two-sided alternative that  $\beta_2$  is not equal to 0.3. You estimated  $\beta_2 = 0.5091$  and  $SE(\beta_2) = 0.01$ . Find the t test statistic at 5% significance level and interpret your results (6mks).

### QUESTION FOUR

Assume you tested for stationarity using ADF and found the following:

	t-Statistic	Prob.
Augmented Dickey-Fuller test statistic	-4.85	0.00
Test critical values:		
1% level	-3.44	
5% level	-2.86	
10% level	-2.57	

- a) Interpret the ADF results clearly stating the null hypothesis (4mks)
- b) Using equations clearly show the difference between AR and MA as applied to univariate time series (4mks)
- c) Explain the difference between cointegration and correlation (2mks)

### QUESTION FIVE

- i. Explain the difference between AR and VAR as applied to time series (4mks)
- ii. Using diagrams illustrate the typical patterns of autocorrelation (6mks)