



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY, JABI - ABUJA
FACULTY OF SOCIAL SCIENCES
2020_2 EXAMINATION ...

COURSE CODE: ECO 356
COURSE TITLE: INTRODUCTION TO ECONOMETRICS II
CREDIT UNITS: 3 UNITS
TIME ALLOWED: 3 HOURS
INSTRUCTION: 1. INDICATE YOUR MATRICULATION NUMBER CLEARLY
2. ANSWER ANY FOUR QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS

QUESTION ONE

- a. i. Define a random variable **2.5marks**
- ii. Differentiate between a discrete and continuous variable **5marks**
- iii. Differentiate between Sample and Sample survey **2.5marks**
- b. Define clearly the following terms.
 - i. Covariance **3.5marks**
 - ii. Population covariance **4marks**

QUESTION TWO

- a. Below are samples of coronavirus patients in Lagos and Abuja. Data were collected for the period of February to July. Determine the sample Variances of data collected from both States. **12.5marks**

| Months | Feb | Mar | Apr | May | June | Jul |
|----------|-----|-----|-----|-----|------|-----|
| Lagos(X) | 3 | 1 | 2 | 2 | 3 | 1 |
| Abuja(Y) | 5 | 3 | 8 | 4 | 7 | 9 |

- b. i. What does correlation (r) measures? **2marks**
- ii. Interpret correlation coefficient when; $r = 1$, $r = -1$ and $r = 0$. **3marks**

QUESTION THREE

- a. State the assumption that underpins multiple regression analysis. **5marks**
- b. Briefly define the term Multicollinearity. **2.5marks**
- c. Briefly discuss methods of solving multicollinearity problem in a regression model **10marks**

QUESTION FOUR

- a. What is the meaning heteroscedasticity in a regression model? **3marks**
- b. Describe the consequences of heteroscedasticity in a regression model. **4marks**
- c. The Spear-Man rank correlation test is a technique of detecting heteroscedasticity in a regression model. Using the data below, test the present of heteroscedasticity.

| | | | | | |
|---|------|------|------|------|------|
| X | 5 | 6 | 8 | 12 | 15 |
| E | 0.59 | 2.48 | 1.54 | 1.98 | 3.24 |

Where X is the independent variable and e is the estimated residual. **10.5marks**

QUESTION FIVE

- a. Describe the term Autocorrelation. **2.5marks**
- b. State the possible causes of autocorrelation in a model. **10marks**
- c. "The sample distribution of d in Durbin-Watson (DW) test for Autocorrelation depends on the values of explanatory variables and the DW derived from upper limits (d_U) and lower limits (d_L) for the significance level of d ". Interpret DW test for Autocorrelation if
 - i. $d < d_L$ or $d > 4 - d_L$ **1mark**
 - ii. $d > d_U$ or $d < 4 - d_U$ **1mark**
 - iii. $d_L < d < d_U$ or $4 - d_U \leq d \leq 4 - d_L$ **1mark**
- d. Without mathematical expression, describe Adaptive Expectation Model (AEM). **2marks**

QUESTION SIX

- a. Describe the following terminologies in econometrics:
 - i. Dummy Variable **3marks**
 - ii. Structural model **3marks**
- b. i. Define Simultaneous equation model. **5.5marks**
- iii. State the essential features of simultaneous equation model. **6marks**