NATIONAL OPEN UNIVERSITY OF NIGERIA
DEPARTMENT OF ECONOMICS
FACULTY OF SOCIAL SCIENCES
2019_1 EXAMINATION

COURSE TITLE: INTRODUCTION TO ECONOMETRICS II
COURSE CODE: ECO 356
UNITS: 3
TIME ALLOWED: 3HOURS

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER THREE QUESTIONS.
QUESTION ONE CARRIES 25 MARKS WHILE OTHER QUESTIONS CARRY 15 MARKS EACH.

1a. Obtain the expression for determining β_0 and β_1 given a linear regression function of the form:
$$Y_t = \beta_0 + \beta_1 X_t + \varepsilon_t$$

Where Y_t is the quantity supplied in period t and X_t is the price of the commodity in period t
$\beta_0 > 0$ and $\beta_1 > 0$ (15 marks)

1b. Show that the sample estimation of β_0 and β_1 i.e. $\hat{\beta}_0$ and $\hat{\beta}_1$ is a Best Linear Unbiased Estimator
(BLUE) of β_0 and β_1.   (10 marks)
                                                            (25marks)

2a. Discuss the underlying assumptions of Ordinary Least Squares (OLS) regression model regarding the
true disturbance term and the fixed values of the regression.   (10marks)
2b. Write short note on dummy variable and its use in econometric analyses.   (5 marks)
                                                            (15 marks)

3. The following data are the consumption expenditures Y and incomes X from 1980 – 1990

Year	Y	X
1980	100.14	94.62
1981	141.36	121.31
1982	181.41	161.32
1983	212.30	196.14
1984	254.72	280.24
1985	282.63	311.18
1986	318.14	336.00
1987	323.43	364.00
1988	368.48	389.14
1989	378.14	415.32
1990	394.78	420.86

(i)   Estimate the consumption function   (5 marks)
(ii) What is the marginal propensity to consume   (2 mark)
(iii) Forecast the consumption at the mean income of the sample   (2 mark)
(iv) Testwhether the value of MPC is truly less than one ($\alpha = 0.05$)   (3 marks)
(v)   Does your result support the Keynesian consumption hypothesis? Explain.   (3 marks)
(15 marks)

4. The results below show the estimate obtained in the regression analysis to determine the relationship between economic growth and government expenditures

	Coefficient	Standard Error (SE)	t	(p) value
Constant (C)	2.129234	0.304195	6.999563	0.0000
LOGCE	0.426258	0.153972	2.768414	0.0097
LOGRE	0.148359	0.081232	1.826370	0.0781
LOGDP-1	-0.008408	0.123332	-0.068177	0.9461

$R^2 = 0.991702$ Adjusted - R^2 (Adjusted coefficient of determination) = 0.990558
Durbin Watson (DW) = 1.550248;
F-statistics = 866.4929; probability (f-statistics) = 0.0000
Our theoretical expectations are:

$\dfrac{dGDP}{dCE} > 0$, $\dfrac{dGDP}{dRE} > 0$, $\dfrac{dGDP}{dGDP\text{-}1} > 0$,

Where GDP = Gross Domestic Product
       CE = Capital Expenditures
       RE = Recurrent Expenditures
       GDP -1 = One year lagged of GDP

REQUIRED:
(i)   Interpret the results and establish the validity of the results at $\alpha = 0.05$ (8 marks)
(ii)   Do the results meet the theoretical expectations? Explain.   (2 marks)
(iii) Obtain the confidence interval of the coefficients of GCE and GRE.   (5 marks)
(15 marks)

5a. What do you understand by the term Multicollinearity?   (8marks)
5b. How can multicollinearity be minimised?   (7marks)
(15 marks)

6a. Whatare the possible causes of autocorrelation?   (8 marks)
6b. What are the consequences of heteroskedasticity in the simple OLS.?   (7 marks)
(15marks)