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FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS
HARMATTAN SEMESTER EXAMINATION 2017/2018 SESSION
Course Code/ Title: ECO 317/ Introductory Econometrics Time Allowed: 120 minutes
Instruction: Attempt all Questions in Section A and ONE Question from Section B.
SECTION A: ***Attempt All Questions in this Section. All questions carry equal marks.***

1. $Var(aX + bY) =$
2. The Student t distribution is.....
3. When there is ∞ degree of freedom, the t_∞ distribution is .....
4. The variance of $\bar{Y}$, $\sigma_{\bar{Y}}^2$ is given by .....
5. The mean of the sample average $\bar{Y}$, $E(\bar{Y})$ is .....
6. An estimator is .....
7. An estimate is .....
8. An estimator $\hat{\mu}_Y$ of the population value is μ_Y consistent if .....
9. The standard error of $\bar{Y}$, $SE(\bar{Y}) = \hat{\sigma}_{\bar{Y}}$ is given by .....
10. When you test a hypothesis against a two-sided alternative, then the alternative is .....
11. A large p-value implies .....
12. If the null hypothesis states $H_0 : E(Y) = \mu_{Y,0}$, then a two-sided alternative hypothesis is...
13. The t-statistic is defined as .....
14. When the sample size n is large, the 90% confidence interval for μ_Y is ....
15. When the estimated slope coefficient in the simple regression model, $\hat{\beta}_1$ is zero, and then R^2 is .....
16. Heteroskedasticity means .....
17. The reason why estimators have a sampling distribution is .....
18. The sample average of the Ordinary Least Squares residuals is .....
19. The slope estimator $\hat{\beta}_1$ has a smaller standard error, other things equal if .....
20. The regression R^2 is a measure of .....
21. Under the least squares assumptions (zero conditional mean for the error term, X_i and Y_i being i.i.d., and X_i and u_i having finite fourth moments), the Ordinary Least Squares estimator for the slope and intercept is .....
22. $E(u_i|X_i) = 0$ implies .....
23. In the linear regression model, $Y_i = \beta_0 + \beta_1 X_i + u_i$, $\beta_0 + \beta_1 X_i$ is referred to as ....
24. The interpretation of the slope coefficient in the model $\ln(Y_i) = \beta_0 + \beta_1 \ln(X_i) + u_i$ is .....
25. In nonlinear models, the expected change in the dependent variable for a change in one of the explanatory variables is given as .....
26. Errors-in-variables bias arises from .....
27. ..... happens by including another variable in the regression.
28. Give an expression for the formal test of serial correlation .....

29. Assuming that there is five variables in a model of which one endogenous and four exogenous. If the endogenous is I (1) series and two of the exogenous is I (0) series, write out the estimated model. .....
30. Although, the necessary condition does not matter in optimization process but the sufficient condition count a lot, state the test of the most vital condition. .....
31. Economic model differs from mathematical model likewise the econometric model, using demand function state the expression for each model.
32. Using the demand function, examine the evaluation of a model estimates.
33. What are the assumptions of *Student 't'* test and when can we use it?
34. Fill in the blank space

Estimates	Mean	Variance	Standard Deviation
ε			
$\hat{\beta}_0$			
$\hat{\beta}_1$			

35. List any two steps involve in testing heteroscedasticity using Goldfeld-Quandt test.
36. In a model: $u = y - a - bx_1 - cx_2$; what are the sample assumptions?
37. State the criteria used in evaluation of econometric model .....
38. In testing for the validity of individual variable in a model we use ..... test.
39. State the rule of thumb of testing for the significant of a variable .....
40. List any two assumptions of econometric model .....

Assuming you have a regression estimates as follow:

$$\hat{Y} = 2.5 + 0.94X_1 - 0.52X_2$$

s.e (0.91) (1.21) (0.23)

$R^2 = 0.75$; adjusted $R^2 = 0.72$ and F-statistic = 4.62 if n=20

41. State the statistical significance of the results in model above.....
42. What is the overall significance of the model above?
43. Determine the Z-test and confidence interval of the estimates of the above model.
44. S_{11}.....
45. S_{22}.....
46. S_{1y}.....
47. S_{yy}.....
48. The mean and standard errors of δ_0 and δ_1 are ..... and .....
49. With a well labeled diagram and mathematical procedure, prove that $R^2 = 1 - \frac{\sum(Y-\hat{Y})^2}{\sum(Y-\bar{Y})^2}$
50. ..... is used for testing hypothesis about the relationship between a regressand and regressors for prediction.

50 marks

SECTION B: Attempt Any One Question in this section

1. The table below shows the amount of corn produced with fertilizer in Onanuga & Oseni farm's settlement between 2008 and 2017.

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Corn Produced	40	44	46	48	52	58	60	68	74	80
Fertilizer Used	6	10	12	14	16	18	22	24	26	32

Using the table above, fill the blank spaces in the three tables below:

(a) **Table I: Model summary**

R	*R- Squared*	*Standard Error*	*Durbin-Watson Stat*

(b) **Table II: Analysis of Variance**

Source	*Sum of Squares*	*Degree of Freedom*	*Mean Square*	*F-Statistic*
Regression				
Residual				
Total				

(c) **Table III: Coefficients**

Variables	*Coefficients*	*Standard Error*	*T-test*	*Significant Level*
Constant				
Independent				

(d) Interpret all the results in the table in order of arrangement. (*Hint: Show all your workings*) **20 marks**

2. The table below represents the *results of the relationship among female literacy rate (FL), health facilities (HEXP) and infant mortality rate (infant) in Nigeria between 1981 and 2012.*

Dependent Variable: INFANT				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	46.83212		4.230237	0.0008
FL	-11.98628	3.364797		0.0031
LOG(HEXP)	0.042918		0.132909	0.8968
POVTY*	0.166571	0.03[illegible]		0.0006
R-squared	0.580363	F-statistic		8.434046
Adjusted R-squared	0.495446	Prob(F-statistic)		0.015224
S.E. of regression	0.136708	Durbin-Watson stat		1.941229

Source: Ejiofor Chinenye C., 2014

Note implies poverty reduction*

You are required to:

a. *Fill in the blank space and state the extraneous variable employed by the author.*
b. *Express the estimated result above in functional form.*
c. *Kindly give a detail economic interpretation to the result above.*
d. *How many variables employed in the analysis?*
e. *Write out in tabular form, the dependent and independent variables.*
f. *By examining the model critically, do we have any estimation problem? If Yes or No, why? (Hint: relate your discussion here with reference to specific problem in regression analysis).* **20 marks**