

BA 2ND YEAR 3RD SEMESTER 2019

SUBJECT: ECONOMICS

PAPER : ECONOMETRICS (OLD)

Time : 2 and half hours

Full marks: 30

Answer any three questions

3 x 10 = 30

1. Consider a two variable linear regression model

$Y_i = \alpha + \beta X_i + u_i$, where the symbols are usually defined.

- (a) Discuss the reasons of inclusion of u_i
(b) Explain what you mean by an unbiased estimator.
(c) Find out the unbiased estimator of the variance of the disturbance term.

2 + 3 + 5 = 10

2. Consider a data set generated by a homoscedastic and non auto-correlated model

$Y_i = \alpha + \beta X_i + u_i$, with 10 observations.

$\sum X_i = 80$, $\sum Y_i = 96$, $\sum X_i Y_i = 789$, $\sum X_i^2 = 668$, $\sum Y_i^2 = 952$

- (a) Find out OLS estimate of α and β .
(b) Find out goodness of fit of the model.

(c) Test the statistical significance of the estimated parameter β , given the tabulated $t_{.025,8} = 2.306$.

4 + 3 + 3 = 10

3. (a) What do you mean by the problem of multicollinearity? Discuss its consequences.

(b) Describe one suitable test for multicollinearity.

5 + 5 = 10

4. (a) For a linear regression model explain the concept of BLUE

(b) Consider a two variable linear regression model

$Y_i = \beta X_i + u_i$, where the symbols are usually defined. Show that under heteroscedasticity OLS estimate will not be BLUE.

[Turn over

5. (a) What is meant by autocorrelation?
(c) Discuss a suitable test for detecting the presence of autocorrelation.

4+6=10

6. Write Short note on (any two)
- (a) Dummy variable and dummy variable trap
 - (b) Estimation of variance-covariance matrix of error term, if it follows AR (1)
 - (c) Estimation of the parameters of the regression equation if the error term follows AR(1)
 - (d) Estimation of the variance-covariance matrix of the error term for a general linear regression model.