BA 2nd Year 3rd Semester Examination , 2018

Economics (Honours)

Paper : Econometrics

Time   2 hours   Full marks 30

Answer any three questions

1(a). In a linear regression model why do you carry out Analysis of variance test? Considering a two variable linear regression model explain how do you carry out such test?

(b) A sample of 10 observations corresponding to non- auto-correlated and homoscedastic regression model

$Y_i = \alpha + \beta X_i + u_i$

Where u_i is normal with zero mean and unknown variance gave the following observations

$\sum X_i = 60, \quad \sum Y_i = 80, \quad \sum X_i Y_i = 379, \quad \sum X_i^2 = 470, \quad \sum Y_i^2 = 754$

Carry out ANOVA test for the above model at 5% level of significance and give interpretation of the result. Given $F_{1,,8}$ = 5.32 corresponding to upper 5% level of significance.

5+5

2(a)Explain Gauss-Markov Theorem. Consider a multivariate linear regression model

$$Y - X\beta + U$$

Y= nx1, X=nxk, U= nx1, U satisfies all the standard assumptions of classical linear regression model. Show that Gauss Markov theorem will hold for this model.

(b) Explain the terms R^2 and adjusted R^2 highlighting the relation between these two and Find the expression of R^2 for the model specified in 2(a)

6+4

3(a) Distinguish between exact and near exact multicollinearity   highlighting their consequences.

(b) Show how dropping of the variables can be a solution for the problem of multicollinearity explaining conditional omitted variable method of estimation.   4+6

[Turn over

4(a) State the problem of autocorrelation for a linear regression model and explain the autoregressive process of order one, highlighting the basic assumptions.

(b) Assuming that the disturbance term in the regression model follows AR(1) process, find out variance covariance metrics of the error term.

4+6

5(a) Explain the dummy variable and dummy variable trap.

(b) Suppose we are interested in finding out the effect of income on consumption on for a number of household . Suppose we have data on education level of the household which are given in four categories(i) illiterate, (ii) just illiterate, (iii) up to school final and (iv) school final and above. Formulate a suitable model for finding out the effect of different categories of education mentioning the necessary assumptions.

5+5

6. Write short note on (any two)

(a) Durbin Watson test

(b) Test for heteroscedasticity.

(c) Estimation of the parameters of the linear regression model, if the disturbance term follows first order autoregressive process of order one.

5+5