UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – 2019

Paper: Applied Econometrics (Theory)
Course Code: STAT-409 Part – I (Compulsory) Time: 15 Min. Marks: 10

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Signature of Supdt.:

ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.
Division of marks is given in front of each question.
This Paper will be collected back after expiry of time limit mentioned above.

Q.1. State whether each of the following statements is true or false OR uncertain. (10X1=10)

(i) The method of OLS is not applicable to estimate a structural equation in a simultaneous-equations model.

(ii) Two stage least squares method is applicable for under identified equation.

(iii) In the presence of a stochastic regressor(s) and an autocorrelated error term, the method of instrumental variables will produce unbiased as well as consistent estimates.

(iv) Underfitting a model (omitting relevant variable(s), L.S. estimators are biased as well as inconsistent.

(v) The D.W. d test assumes that the variance of the error term is homoscedastic.

(vi) If heteroskedasticity is present, the conventional t and F test are valid.

(vii) Despite perfect multicollinearity, OLS estimators are BLUE.

(viii) For quarterly data, we should define three dummy variables to check seasonality of the data.

(ix) In Aitken Theorem, error terms of GLR model are Non Spherical.

(x) Even though the disturbance term in the classical linear regression model is not normally distributed, the OLS estimators are still unbiased.

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Paper: Applied Econometrics (Theory)
Course Code: STAT-409 Part – II

Time: 2 Hrs. 45 Min. Marks: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Discuss briefly the following:

(i) Assumptions of generalized least squares

(ii) Heteroskedasticity

(iii) Instrumental variable

(iv) Indirect Least squares method

(v) Geary test for Autocorrelation

(20)

Q.3. Following are the OLS residuals obtained by fitting the model $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \in$

19.98, 11.50, -1.78, 0.33, -6.05, -14.83, -14.12, -14.39, -9.17, -0.36, 4.86, 1.68, 9.10, 10.32, 2.93

Test autocorrelation by Geary test and estimate first order autocorrelation Co-efficient by Cochran-orcutt two step procedure.

(10)

Q.4. Consider the model:

$y_1 = \beta y_2 + u_1, \quad y_2 = \alpha_1 y_1 + \alpha_2 x_1 + \alpha_3 x_2 + u_2$

Obtain consistent estimates of structural parameters $(\beta, \alpha_1, \alpha_2, \alpha_3)$, where possible, by appropriate method using the calculations.

$\Sigma x_1^2 = 1$, $\Sigma x_2^2 = 20$, $\Sigma x_1 x_2 = 0$, $\Sigma x_1 y_1 = 5$, $\Sigma x_2 y_1 = 40$,

$\Sigma x_1 y_2 = 10$, $\Sigma x_2 y_2 = 20$

(10)

Q.5. For GLR model $Y = \beta_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u$ such that Var $(u_i) \propto X_{3i}$, residual SS for first 30 observations is 377.17 and residual SS for last 32 observations is 1536.80. Test the Heteroskedasticity.

(05)

Q.6. Discuss the practical consequences of Multicollinearity.

(05)