# M.A. 2$^{ND}$ YEAR 3$^{RD}$ SEMESTER, 2019

## SUBJECT: ECONOMICS

## PAPER: ADVANCED ECONOMETRICS I

**TIME: 2hours**                                              **Full Marks 30**

### Answer any three questions

1. (a) What do you mean by method of moments estimators? In this context explain the concept of Generalized Method of moments (GMM) estimator.

   (b) Show that 2SLS estimator is a special case of GMM Estimator.

   **4+ 6**

2. (a) Explain the concept of fully GMM estimator. For a general linear regression model derive fully efficient GMM estimator highlighting the basic assumptions.

   (b) How do you test for over identifying restrictions for general linear regression model using GMM estimators?

   **6+ 4**

3. (a) What do you mean by specification errors in the regression model ?

   (b) Expain the concept of intrinsically  linear model. Give some examples of such type of model.

   (c) How do you test the restrictions on the parameters for such type of the model?
   **2+ 3+5**

4. (a) Explain the test for linearity based on BOX-COX transformation.

   (b) Let the correct specification be

   $Y_i = \mu X_i \omega_i$

   Where $\omega_i$  is the disturbance term having lognormal distribution. But we postulate

$Y_i = \mu X_i + e_i$

Where $e_i$ is the disturbance term having usual properties of classical linear regression model and estimate the parameters by OLS. Show that the resulting estimator is biased and inconsistent.

**5+ 5**

5. Suppose there is a dynamic panel model as,

$y_{it} = \delta y_{it-1} + \varepsilon_{it}$

$\varepsilon_{it} = \alpha_i + u_{it}$

Where $i= 1,2,3,4,5, 6$ and $t=1,2,3,4, 5$

With $\alpha_i$ follows iid$(0, \sigma_\alpha^2)$ and $U_{it}$ follows iid$(0, \sigma_u^2)$

(a) Derive the matrix of all possible valid instruments for $i^{th}$ cross-section.

(b) How many numbers of orthogonality conditions are there for each cross-section? (Write in a matrix form)

(c) Derive Two-step Arellano and Bond (1991) estimator for the above model. Why is Two-step Arellano and Bond (1991) estimator an improvement over the One-step Arellano and Bond estimator ?

**2+4+4=10**

6. Write short note on (any two) :

**2 x 5=10**

   a. Discuss different types of deviation operators used in Arellano and Bover (1995) estimation method.
   b. Test for linear restrictions in a General linear regression model using GMM estimator
   c. HAC Covariance estimator.
   d. Haussmann's specification error test