

**M.A. Examination, 2016**  
**Semester-I**  
**Economics**  
**Course-II**  
**(Econometrics)**

**Time: 3 Hours**

**Full Marks: 40**

*Questions are of value as indicated in the margin*

Answer *any four* of the following questions

1. a) Write down the assumptions of the Classical Linear Regression Model (CLRM) stating clearly the meanings of all the symbols. 5  
b) Derive the OLSE of the vector of the  $\beta$ -parameters in the Model in a). above. 5
2. In the context of the CLRM,
  - a) Find BLUE of an arbitrary linear combination of the  $\beta$ -parameters. 7
  - b) Obtain BLUE of the average of the  $\beta$ -parameters. 3
3. In the context of the CLRM,
  - a) Show that Total Sum of Squares is equal to the sum of Explained Sum of Squares and Residual Sum of Squares. 5
  - b) Obtain the relation between the explained variable and the explanatory variables when  $R^2$  equals to 1. 5
4. In the context of the CLRM,
  - a) What do you mean by the test of the significance of some particular explanatory variable? 3
  - b) Describe a suitable procedure for the test in a). above, starting from appropriate assumption regarding the distribution of the disturbance vector. 7
5. For the model :  $Y_i = \alpha + U_i, U_i \sim N(0, \sigma^2 \times_i^2), E(U_i U_j) = 0$  for all  $i \neq j$ ,  $X_i$ 's are non-stochastic, find, with justification, a BLUE of  $\alpha$ . 10
6. a) What is meant by the Autoregressive Process of order 1? 3  
b) In the presence of AR(1), derive the matrix of the autocorrelation coefficients among the elements of the disturbance vector. 7
7. a) Define dummy variables and explain their usefulness. 6  
b) Describe dummy variable trap. 4
8. Write short notes on *any two* of the followings: 5+5
  - a) Consequences of heteroscedasticity.
  - b) Durbin-Watson Test.
  - c) Consequences of multicollinearity.