

2017

Time : 3 hours

Full Marks : 70

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value.

Answer **four** questions from Group – A and **two** questions from Group – B.

Group – A**(Short-answer Type Questions)**

1. What are the reasons for the inclusion of the random variable in an econometric research ?
2. In the context of a two variable linear model, prove that the OLS estimators are BLUE.
3. Given the following :

$$\sum X_i = 250 \quad \sum Y_i = 300 \quad n = 25$$

$$\sum x_i^2 = 350 \quad \sum x_i y_i = 600 \quad \sum e_i^2 = 120$$

where x_i and y_i are deviations from mean, n is the number of observations.

Estimate the regression line $Y_i = \alpha + \beta X_i + u_i$.

4. What is meant by autocorrelation ? Explain its effects on OLS estimator.
5. Define heteroscedasticity and prove that the OLS estimators are unbiased but inefficient under heteroscedasticity.
6. Define the dummy variables. Explain the use of dummy variables.

Group – B

(Long-answer Type Questions)

7. Outline the test procedure of Goldfeld-Quandt to detect the problem of heteroscedasticity.
8. What are distributed lag models ? Explain some of the log schemes.
Illustrate Koyck's geometric lag scheme.
9. Define autocorrelation. Explain Durbin-Watson test for detection of autocorrelation.

10. Give the Markov first order autoregressive scheme with error term :

$$u_t = \rho u_{t-1} + v_t \quad -1 < \rho < +1$$

establish the following results :

$$(a) \text{Var}(u_t) = \frac{\sigma_v^2}{1 - \rho^2}$$

$$(b) \text{Cov}(u_t, u_{t-s}) = \rho^s \frac{\sigma_v^2}{1 - \rho^2}$$

