SUBJECT CODE: 19EC/PC/EC34

M.A. DEGREE EXAMINATION NOVEMBER 2022
THIRD SEMESTER

COURSE   : CORE
PAPER   : ECONOMETRIC METHODS I
TIME   : 3 HOURS   MAX.MARKS: 100

SECTION – A
I. ANSWER ANY FIVE QUESTIONS. EACH ANSWER NOT TO EXCEED 300 WORDS.   **(5X8=40)**

1. Briefly explain each stage of empirical econometric research citing a research problem.

2. Why does autocorrelation exist? Suggest remedial measures for this problem.

3. Explain the idea behind the Analysis of Variance technique and how is it different from the normal regression analysis.

4. Explain the causes and consequences that leads to the existence of correlation between its independent variables.

5. Suppose $Y_i = \beta_1 + \beta_2 X_i + U_i$ is the simple linear regression . $\hat{\beta}_2$ is the point estimator. Give equations and explanations for interval estimation and construction of confidence interval.

6. If there are a large number of samples and the σ_i^2 is not known, explain the different assumptions that help to solve the problem of heteroscedasticity.

7. From the given regression equation :

    $$\hat{Y}_i = \hat{\beta}_0 + \hat{\beta}_1 X + e_i$$

    Derive the values of $\hat{\beta}_0$ **and** $\hat{\beta}_1$, which will minimise the sum of the squared residuals $(\Sigma\ e_i^2)$.

SECTION – B
II. ANSWER ANY THREE QUESTIONS. EACH ANSWER SHOULD NOT EXCEED 1200 WORDS.   **(3 X 20 = 60)**

8. Discuss the various economic applications of double-log and reciprocal model.

9. A simple linear regression model is given as $Y_i = \beta_0 + \beta_1 X_1 + U_i$ where the model follows all the basic OLS assumptions and $i = 1,2,3…..n$
    a. Derive the coefficient of determination from the given information and say the value is non-negative.
    b. How is R^2 different from Adjusted R^2?

10. Let $Y = f(X_2, X_3)$ and the functional relationship is linear, the multiple linear regression model for 3 variables is $Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + U_i$. Derive formula for β_1, β_2 **and** β_3 and show that these estimation are BLUE estimators.

11. a. Explain the Gauss Markov theorem in matrix notation.
     b. Prove with reference to Gauss Markov Theorem that OLS estimators in the class
        of linear unbiased estimator have the minimum variance.

12. Explain in detail all the assumptions of Ordinary Least Squares (OLS) in a linear
     regression model.

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