RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FOURTH SEMESTER EXAMINATION, AUGUST 2021

SECOND YEAR [BATCH 2019-22]

Date : 07/08/2021 **ECONOMICS (HONOURS)**

Time : 11.00 am – 1.00 pm **Paper : VIII [CC8]** Full Marks : 50

Answer **any four** of the following questions: [4×5]

1. Prove that the coefficient of determination in case of simple linear regression (with intercept) is the square of correlation coefficient between dependent and independent variable.

2. You obtained the following regression result

$$\hat{Y}_t = 50 - 2978\,X_t,\ R^2 = 0.61$$
$$(629)$$

The figure in the bracket is the standard error. Find out the sample size (n) underlying the result.

3. Explain why the coefficient of determination $\left(R^2\right)$ (in case of linear regression with intercept) increases with the increase of number of regressors.

4. Suppose you want to estimate the following model $\log Q = \alpha + \beta_1 \log L + \beta_2 \log K + u$, where Q = output , L = labour units, K = value of capital, & u is the stochastic disturbance term.

   Further suppose, you want to test for the equality of elasticity of labour & Capital.

   Explain the steps involved in coming up with the decision rule for the statistical test.

5. Explain why you cannot use the conventional R^2 in case of linear regression model without intercept.

6. How do you decide if the addition of a regressor (in the context of multiple regression) has been statistically significant?

Answer **any two** of the following questions: [2×15]

7. State the CLRM assumptions. Prove that the OLS estimator (in case of simple linear regression with intercept) of the slope coefficient is BLUE. (5+10)

8. What are the limitations of DW (Durbin-Watson) test in the context of detecting autocorrelation? How do you remedy the problem of autocorrelation? (5+10)

9. Explain Goldfeld-Quandt test. Explain WLS (Weighted least squares) as the remedial solution for the problem of heteroskedasticity. (5+10)

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