

**U.G. 4th Semester Examination - 2021****ECONOMICS****Course Code: BECOCCHT 403****Course Title: Introductory Econometrics**

Full Marks : 40

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **ten** questions from the following: 1×10=10
- a) Define time series data.
  - b) What is meant by experimental data?
  - c) On the basis of what property accuracy of an estimator is assessed?
  - d) On which basis reliability of an estimator is assessed?
  - e) What is the full form of CLRM?
  - f) What is Asymptotic Unbiasedness?
  - g) Nonfulfillment of which CLRM assumption indicate the presence of Heteroscedasticity?

- h) For which type of data Autocorrelation is more common in regression studies?
- i) What is standard error of an estimator?
- j) What are outliers?
- k) The overall significance of an estimated multiple regression model is tested by which test?
- l) What is the relation between  $R^2$ ,  $R^{-2}$ , number of observations and parameters of the model in multiple regression analysis?
- m) Suggest an appropriate method to examine presence of higher order autocorrelation in regression analysis.
- n) What is a slope dummy?
- o) What is specification error?

2. Answer any **five** questions: 2×5=10
- a) Why an error term is added to an econometric relationship?
  - b) Write assumptions of the error term in a regression analysis.
  - c) Write two small sample properties of OLS estimators.

*[Turn Over]*

- d) What is the relation between Regression Slope and Correlation Coefficient in SLRM?
- e) What is the relation between  $r^2$  and 't'-statistic in SLRM?
- f) Write two limitations of Goldfeld-Quandt Test.
- g) Write two ways when value of autocorrelation coefficient is unknown.
- h) What will be the nature of OLS estimates when the data is autocorrelated?

3. Answer any **two** questions:  $5 \times 2 = 10$

- a) Explain how you would assess goodness of fit of an estimated model in SLRM.
- b) How would you examine the relevance of an additional explanatory variable in the context of multiple regression exercises? Explain the test procedure and the decision rules here.
- c) Explain how the Durbin-Watson test helps to detect the presence of autocorrelation in data.

4. Answer any **one** question :  $10 \times 1 = 10$

- a) i) Prove that OLS estimators are inefficient but consistent under heteroskedasticity.

- ii) Suggest some corrective measures for heteroskedasticity. 7+3

- b) We have the following results from a regression study :

$$\hat{y}_i = 0.7264 + 1.0598X_i$$

(0.3001) (0.0728)

$$r^2 = 0.4710, F_{1,238} = 211.895 \text{ df} = 238$$

(figures in parenthesis are standard error)

- i) Test the null hypothesis of the coefficient of  $X_i$  greater than 1.
- ii) Is the intercept coefficient greter than 0?
- iii) What does the value of  $r^2$  imply? Is it statistically significant? 3+3+4
- c) In the context of two variable linear model, prove that OLS estimators are
  - i) Unbiased
  - ii) Linear
  - iii) Minimum variance 3+2+5