

# RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FIFTH SEMESTER EXAMINATION, FEBRUARY 2022

THIRD YEAR [BATCH 2019-22]

ECONOMICS (Honours)

Paper : XII [CC12]

Date : 28/02/2022

Time : 11 am – 1 pm

Full Marks : 50

Answer **any five** questions of the following:

[5×10]

1. Show that, in the context of general linear model, the OLS estimators of the regression parameters are BLUE. [10]
2. Prove FWL theorem. [10]
3. a) Distinguish between slope dummy and intercept dummy variables, using a suitable example.  
b) Explain why it is important to have (m-1) dummy variables in case a qualitative variable has 'm' categories in the regression model involving intercept. [5+5]
4. a) Explain the problem associated with modelling dependent dummy variable using linear probability model (LPM).  
b) How do you overcome the problems of LPM? [5+5]
5. Suppose you want to estimate the following log-linear Cobb-Douglas production function:  
 $\log Q = \alpha + \beta_1 \log L + \beta_2 \log K + u$ ,  
Where Q = output, L = labour input, K = value of capital, and 'u' is the stochastic disturbance term. Describe the test procedure to examine the equivalence of elasticities of labour and capital. [10]
6. a) What are the sources of multi-Collinearity?  
b) Explain the consequences of the presence of multi-Collinearity in a linear regression model. [5+5]
7. Let  $X' = [X_1 \ X_2 \ X_3]$  denote a random vector, where  $X_i \sim N(0, 2^2), i = 1, 2, 3$ .

$$\text{Let } A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}.$$

Find the distribution of  $X'AX$  and its expectation.

[10]

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