Total No. of printed pages = 4

2022

ECONOMICS

(Theory Paper)

Paper Code : ECO 2.4

(Elements of Econometrics)

Full Marks – 80

Time – Three hours

The figures in the margin indicate full marks
for the questions.

1. Answer the following questions :   2×4=8

(a) What do you mean by linear regression model ?

(b) Explain simultaneous equation bias.

(c) Mean of disturbance term as zero implies ?

(d) Multicollinearity is a resultant of ?

[Turn over

2. Answer the following questions : 5×4=20

(a) Outline the assumptions of CLRM.

(b) Explain the differences between regression and correlation.

(c) $R^2 > \bar{R}^2$. Why ?

(d) Explain dummy variable trap.

3. Answer any *two* of the following questions :

10×2=20

(a) Discuss the nature of Structural form and Reduced-form equation of SEM.

(b) Following table gives the Gross national product (X) and Demand for food (Y) measured in arbitrary units in an under-developed country over 10 years period :

Year	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Y	6	7	8	10	8	9	10	9	11	10
X	50	52	55	59	57	58	62	65	68	70

Estimate $Y = a + b\,X + U$

(c) Explain the consequences of multi-collinearity on OLS estimators and its variances.

(d) Show the use of dummy variables for change in intercept and slope over time.

4. Answer the following questions : 16×2=32

(a) In a simple linear regression model

$Yi = a + bXi + Ui$, where random variable is distributed with zero mean and constant variance. Show that the least square estimators are BLUE. Also give justification for the presence of error term in the model.

10+6=16

Or

Formulate the estimators for the model $Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + u_i$. Derive the R^2 for it.

10+6=16

(b) State the order condition for identification of simultaneous equation. Consider the following model :

$C_t = \alpha_0 + \alpha_1 Y_t + U_1$

$I_t = \beta_0 + \beta_1 Y_t + \beta_2 Y_{t-1} + U_2$

$Y_t = C_t + I_t + G_t$

Examine whether the equations are identified or not.

6+10=16

Or

Given the monthly electricity subsidy and disposable income estimate its impact on monthly electricity bill of a household.

Bill (Rs.)	4	6	7	9	13	15
Income (Rs.)	15	12	8	6	8	12
Subsidy (Rs.)	30	24	20	14	10	8