6 SEM TDC DSE STS (CBCS) 5 (H)

2 0 2 4

(May)

STATISTICS

(Discipline Specific Elective)

(For Honours)

Paper : DSE–5

(Econometrics)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

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

1. Choose the correct answer from the following :   1×5=5

   (a) The full form of CLR is

      (i) Class Line Ratio

      (ii) Classical Linear Regression

      (iii) Classical Linear Relation

      (iv) None of the above

(Turn Over)

(b) In the regression function $y = \alpha + \beta x + c$

    (i) x is the regressor

    (ii) y is the regressor

    (iii) x is regressed

    (iv) None of the above

(c) Multicollinearity is used to denote

    (i) the presence of linear relationship among explanatory variables

    (ii) the presence of non-linear relationship among explanatory variables

    (iii) the presence of linear relationship among dependent variables

    (iv) the presence of linear relationship among endogenous variables

(d) Specification bias or specification error means

    (i) leaving out important explanatory variables

    (ii) including unnecessary variables

    (iii) choosing the wrong functional form between y and x variables

    (iv) All of the above

(e) What is the range of values that the auto-correlation coefficient can take?

    (i) −1 to 0

    (ii) 0 to 1

    (iii) −1 to 1

    (iv) 0 to ∞

2. Answer the following questions in brief :

                                                3×4=12

(a) What are the assumptions of the general linear model?

(b) What causes multicollinearity?

(c) What is the difference between OLS and GLS estimators? Which one is better?

(d) What are the main causes of heteroscedasticity?

3. (a) What is the difference between simple linear regression and classical linear regression? Mentioning the assumptions of a general linear model, obtain an estimate of $\hat{\beta}$ of the vector of unknown coefficient β in matrix form. Also find the mean of $\hat{\beta}$.   3+3+3=9

                                           (Turn Over)

Or

(b) Given that

$$\Sigma X_i = 80, \ \Sigma X_i^2 = 680, \ \Sigma X_i Y_i = 828,$$
$$\Sigma Y_i = 100, \ \Sigma Y_i^2 = 1048 \text{ and } n = 10$$

Estimate the parameters of the model $Y_i = \beta_0 + \beta_1 X_i + u_i$ and find R^2. Test the hypothesis that $\beta_1 = 0$. 3+3+3=9

4. (a) What is meant by multicollinearity? What are its consequences? What are its remedial measures? 3+3+3=9

Or

(b) What is meant by specification bias? What are the main causes of specification bias? Explain briefly any one of them. 3+3+3=9

5. (a) Describe the Aitken's estimator. Find its mean and variance. Show that it has least variance in the class of all unbiased linear estimators. 2+4+3=9

Or

(b) What is meant by autocorrelation? What are the consequences of the presence of autocorrelation? Describe any one method of detecting auto-correlation. 2+3+4=9

6. (a) Describe the consequences of the violation of the assumption of homoscedasticity.   6

   Or

   (b) Write an explanatory note on auto-regressive and distributed lag model.   6

★ ★ ★