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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

(2)

- (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

(3)

- (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

(4)

Or

(b) Given that

$$\sum X_i = 80, \sum X_i^2 = 680, \sum X_i Y_i = 828,$$

$$\sum Y_i = 100, \sum Y_i^2 = 1048 \text{ and } n = 10$$

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 autocorrelation.

$$2+3+4=9$$

24P/875

(Continued)

(5)

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

Or

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

24P—500/875

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