

**4 SEM TDC ECOH (CBCS) C 10**

**2023**

( May/June )

**ECONOMICS**

( Core )

Paper : C-10

**( Introductory Econometrics )**

*Full Marks : 80*

*Pass Marks : 32*

*Time : 3 hours*

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

1. Choose the correct answer : 1×8=8
- (a) The property of minimum variance of estimator is known as
- (i) consistency
  - (ii) efficiency
  - (iii) unbiasedness
  - (iv) sufficiency
- (b) Probability of Type I error is
- (i) Degree of freedom
  - (ii) Level of significance
  - (iii) Confidence interval
  - (iv) Standard error

- (c) The coefficient of determination value lies between
- (i) -1 and +1
  - (ii) -1 and 0
  - (iii) 0 and +1
  - (iv) None of the above
- (d) ANOVA model consists of
- (i) quantitative explanatory variables
  - (ii) qualitative explanatory variables
  - (iii) both quantitative and qualitative explanatory variables
  - (iv) None of the above
- (e) The assumption of constant variance of the residual is known as
- (i) heteroscedasticity
  - (ii) homoscedasticity
  - (iii) Both (i) and (ii) are correct
  - (iv) Both (i) and (ii) are wrong
- (f) Which of the following is not a source of multicollinearity?
- (i) Method of data collection
  - (ii) Model and population constraints
  - (iii) Incorrect transformation of variables
  - (iv) Lagged explanatory variables

- (g) Durbin-Watson  $d$ -Test is used to detect
- (i) multicollinearity
  - (ii) heteroscedasticity
  - (iii) autocorrelation
  - (iv) All of the above
- (h) If a qualitative variable has 6 categories, then we have to introduce
- (i) 6 dummy variables
  - (ii) 7 dummy variables
  - (iii) 5 dummy variables
  - (iv) 4 dummy variables

2. Write short notes on any *four* of the following: 4×4=16
- (a) Properties of normal distribution
  - (b) Aims of econometrics
  - (c)  $F$ -distribution
  - (d) Dummy variable trap
  - (e) Errors in variables
3. (a) Define the principle of ordinary least squares. For the classical two-variable linear regression model  $Y_i = \beta_1 + \beta_2 X_i + u_i$ , derive the estimator of  $\beta_1$  and  $\beta_2$ . 2+10=12
- Or
- (b) State and prove Gauss-Markov theorem. 12

4. (a) Explain the significance of the error term in a regression model. Write the full form of CLRM. Discuss the various assumptions of two-variable CLRM.

3+1+7=11

Or

- (b) What is coefficient of determination,  $R^2$ ? How is it computed? How is adjusted  $R^2$  more desirable than  $R^2$  as a goodness of fit?

2+6+3=11

5. (a) Explain the concept of heteroscedasticity. Analyse the consequences of heteroscedasticity.

5+6=11

Or

- (b) Explain the concept of autocorrelation. Discuss the various tests to detect the problem of autocorrelation.

5+6=11

6. (a) Explain the concept of multicollinearity. Discuss the various sources of multicollinearity.

5+6=11

Or

- (b) Explain briefly how multicollinearity can be detected. Discuss various remedial measures to remove the problem of multicollinearity.

5+6=11

7. (a) Define specification error. Discuss its various types.

2+9=11

Or

- (b) Discuss various tests that are commonly used to detect specification error.

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