Total No. of Printed Pages—4

**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. 11

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