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

**2024**

( 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 probability of Type I error is

(i) degree of freedom

(ii) standard error

(iii) level of significance

(iv) None of the above

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(b) The term 'Regression' was introduced by

- (i) Ragnar Frisch
- (ii) Sir Francis Galton
- (iii) Karl Pearson
- (iv) Both (i) and (ii)
- (v) None of the above

(c)  $E(uu') = ?$

- (i)  $\sigma_u^2 I$
- (ii)  $\sigma_u^2 A'$
- (iii)  $I$
- (iv) None of the above

(d) Dummy variable can

- (i) take any value between 0-100
- (ii) take any value between 10-100
- (iii) only take value 0 and 1
- (iv) only take positive values

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(e) Multicollinearity is essentially a

- (i) sample phenomenon
- (ii) population phenomenon
- (iii) Either (i) or (ii)
- (iv) Both (i) and (ii)
- (v) None of the above

(f) In case of multicollinearity problem

- (i)  $R^2$  is high but few  $t$ -test ratios are significant
- (ii)  $R^2$  is low but  $t$ -test ratios are significant
- (iii)  $R^2$  is high with high  $t$ -test ratio
- (iv)  $R^2$  is low with low  $t$ -test ratio
- (v) None of the above

(g) The coefficient of determination value lies between

- (i) -1 and +1
- (ii) -1 and 0
- (iii) 0 and +1
- (iv) None of the above

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(h) ANOVA model consists of

- (i) quantitative explanatory variables
- (ii) qualitative explanatory variables
- (iii) both quantitative and qualitative explanatory variables
- (iv) None of the above

2. Write short notes on any *four* of the following (**within 150 words** each) :  $4 \times 4 = 16$

- (a) Type I and Type II errors
- (b) R-bar square ( $\bar{R}^2$ )
- (c) Perfect multicollinearity v/s imperfect multicollinearity
- (d) Errors in variable
- (e) The stochastic error term

3. (a) What do you mean by econometrics? Distinguish between mathematical economics and econometrics. Explain the nature and scope of econometrics.  $2+4+6=12$

( 5 )

Or

(b) What is null and positive hypothesis? What are the steps involved in hypothesis testing? Discuss with the help of an example.  $4+8=12$

4. (a) "Under the assumptions of the classical linear regression model, the OLS is BLUE." Prove the statement. What is the difference between the stochastic error term and the residual  $u_i$ ?  $7+4=11$

Or

(b) What is Gauss-Markov theorem? Discuss the main assumptions of the OLS.  $3+8=11$

5. (a) Analyse the main consequences of heteroscedasticity. Discuss the remedial measures to remove the problem of heteroscedasticity.  $5+6=11$

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Or

(b) Define different methods to detect the problem of heteroscedasticity. 11

6. (a) What do you mean by autocorrelation? Explain the Durbin-Watson test to detect the problem of autocorrelation. Mention few limitations of the Durbin-Watson test. 3+6+2=11

Or

(b) Discuss the main effects of the autocorrelation problem. How do you remove/solve the problem of autocorrelation? Suggest some measures of the problem. 5+6=11

7. (a) Define specification error. Discuss the main types of specification errors. What are the methods to solve the problem of specification error? 2+4+5=11

( 7 )

Or

(b) What do you mean by errors in variables? Discuss the various tests to detect the problem of specification error. Write two main consequences of omitting relevant variables. 2+5+4=11

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