TDC (CBCS) Even Semester Exam., 2024

ECONOMICS

(4th Semester)

Course No. : ECOHCC–403T

(Introductory Econometrics)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

UNIT—I

1. Answer any *two* of the following questions : 2×2=4

(a) Distinguish between mathematical economics and econometrics.

(b) Mention any two limitations of econometrics.

(c) What are the aims of econometrics?

2. Answer any *one* of the following questions : 10

(a) Discuss the nature and scope of econometrics. Why do we need a separate discipline called econometrics? 6+4=10

(b) Explain the methodology to be followed to carry out an econometric study. 10

UNIT—II

3. Answer any *two* of the following questions : 2×2=4

(a) Assume that X is normally distributed with mean $\mu = 30$ and standard deviation $\sigma = 4$. Find $P(X < 40)$.

(b) What is t-statistic? When is it applied?

(c) Distinguish between type-I and type-II errors.

4. Answer any *one* of the following questions : 10

(a) (i) How can you tell if a hypothesis list should be one-tailed or two-tailed?

(ii) The mean height of 50 and 60 female students for colleges X and Y are 68·1 inches and 67·4 inches with their respective standard deviation of 2·6 inches and 2·9 inches. Test whether average height of the female students are equal. Use 1% level of significance. 3+7=10

(b) (i) Write the properties of normal distribution.

(ii) An intelligence test was conducted on a group of 500 students of Class IX. The mean IQ of the students was found to be 100 and the standard deviation of the IQ scores was 16. Find how many students of the Class IX having the IQ below 80 and above 120. [Given : $P(Z = -1 \cdot 25) = 39 \cdot 447$] 4+6=10

UNIT—III

5. Answer any *two* of the following questions : 2×2=4

(a) Differentiate between R-square and adjusted R-square.

(b) Define the concept of confidence interval.

(c) What are the BLUE properties of OLS estimators?

6. Answer any *one* of the following questions : 10

(a) Consider the model :

$$Y_i = \alpha + \beta X_i + U_i \quad \forall\ i = 1, 2, \cdots, n$$

(i) Estimate the parameters of the model using OLS method.

(ii) Show that least square estimators are BLUE. 4+6=10

(b) State and explain the Gauss-Markov theorem. 10

UNIT—IV

7. Answer any *two* of the following questions : 2×2=4

(a) What do you mean by multiple linear regression model?

(b) Give the justification of the error term in regression model.

(c) Write two uses of dummy variable in regression model.

8. Answer any *one* of the following questions : 10

(a) Suppose a multivariate model

$$Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + U_i \quad \forall\ i = 1, 2, \cdots, n$$

where $\Sigma Y = 20$, $\Sigma Y^2 = 88 \cdot 2$, $\Sigma X_{1i} = 30$, $\Sigma X_{1i}^2 = 92$, $\Sigma X_{2i} = 40$, $\Sigma X_{2i}^2 = 163$, $n = 10$.

(i) Find the regression of Y_i on X_{1i} and X_{2i}.

(ii) Compute ANOVA. 6+4=10

(b) (i) State the assumptions underlying a multiple variable linear regression model. 10

(Continued)

(ii) Explain how the OLS method can be applied for the estimation of the following model :

$$Y = aK^{\alpha} L^{\beta}$$

(iii) Obtain the estimators of α and β of the above model. 3+4+3=10

UNIT—V

9. Answer any *two* of the following questions : 2×2=4

(a) What is perfect multicollinearity?

(b) Point out two reasons under which multicollinearity arises.

(c) Mention any two sources of auto-correlation.

10. Answer any *one* of the following questions : 10

(a) Define heteroscedasticity. What are its consequences? Describe Park test to detect heteroscedasticity. 2+5+3=10

(b) What do you mean by autocorrelation? What are it consequences? Explain the D-W test method for detection of auto-correlation. 2+3+5=10

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