TDC (CBCS) Even Semester Exam., 2023

ECONOMICS

(Honours)

(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

SECTION—A

Answer any *ten* of the following questions : 2×10=20

1. Define an econometric model.

2. Point out two differences between econometrics and statistics.

3. State any two types of statistical data for the purpose of econometric analysis.

4. State any two properties of normal distribution.

5. State the relationship between t and F distribution.

6. Define null hypothesis.

7. State any two assumptions necessary for OLS estimation of the parameters of a two-variable linear regression model.

8. Given the following regression result :

$$\hat{Y}_i = 0{\cdot}7264 + 1{\cdot}0598X_i ; \; i = 1, 2, \cdots, 30$$

where Y_i = consumption expenditure of the ith individual; X_i = income of the ith individual.

Interpret the value of the estimated slope coefficient.

9. What does the value of r^2 indicate?

10. Define partial regression coefficient.

11. What is joint hypothesis testing?

12. Is the following a linear regression model? Justify your answer :

$$Y_i = \beta_0 + \beta_1^2 \ln X_i + U_i \; \forall \; i = 1, 2, \cdots, n$$

13. Violation of which classical assumption gives rise to the problem of multicollinearity?

14. Define heteroscedasticity.

15. State any two sources of autocorrelation.

SECTION—B

Answer any *five* of the following questions : 10×5=50

16. Explain the methodology of an econometric investigation.

17. Compare and contrast between econometrics and mathematical economics. State the limitations of econometrics. 6+4=10

18. State the applications of large sample test. A motor car company claims that their cars run on average of 35 miles per gallon of gasoline. A random sample of 50 cars was tested and found to give an average of 32 miles to a gallon of gasoline with a standard deviation of 1·2 miles. Should we accept the claim of the motor car company? Use 5% level of significance. 5+5=10

19. Distinguish between type I error and type II error. In a sample of 1500 items, the mean is found to be 18·5 and the standard deviation is 4·5. In another sample of 1000 items, the mean is 20 and standard deviation is 4. Assuming that the samples are independent, can they arise from the same normal population? Test at 5% level of significance. 4+6=10

20. For a two-variable linear regression model

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

show that $\hat{\beta}$ is BLU estimator of β.

21. Obtain the estimates of OLS estimators for the following data :

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

22. Derive the OLS estimators of parameters for a multiple linear regression model.

23. Define a dummy variable in the context of an econometric analysis. Distinguish between slope dummy and intercept dummy variables. Explain the phenomenon of dummy variable trap in econometrics. 2+4+4=10

(Continued)

24. Show that OLS estimators are inefficient but consistent under heteroscedasticity.

25. Discuss the theoretical and practical consequences of multicollinearity problem. Suggest some suitable measures to correct the problem of multicollinearity. 6+4=10

★★★