

Date:28-02-2022

Registration number:

ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27

**V SEMESTER EXAMINATION - OCTOBER-2021**

(Examination conducted in March 2022)

**ECS 5118: Basic Econometrics**

Time- 2 ½ hrs Max Marks-70

This question paper contains two printed pages and three parts

**Part A**

**Answer any TEN of the following questions (10x3)**

1. Explain the difference between linearity in variables and linearity in parameters with suitable examples.
2. What is the rationale for introducing the adjusted R2 in a regression model?
3. Illustrate homoscedasticity and heteroscedasticity with the help of two diagrams.
4. What is the difference between error term and residual? Use a simple regression framework to give an example.
5. What is the Chow test used for? Describe using an example.
6. Explain the differences between intercept dummy and slope dummy.
7. Briefly give an account of tests to detect heteroscedasticity.
8. Consider the following predicted regression line:  = 437.2 – 2.28 X. You are told that the t-statistic on the slope coefficient is 4.38. What is the standard error of the slope coefficient?
9. What is the interpretation of 𝛽1 for this model: ?
10. Explain the use of the F-test and t-test in multiple regression analysis.
11. What is the deterministic part of a regression equation? Explain with an example.
12. In a regression model with two explanatory variables, X and Z, how is the interpretation of the coefficient on X different from a model with only X as the explanatory variable?

**Part B**

**Answer any TWO of the following questions (2x5)**

1. What is a dummy variable trap? A researcher seeks to understand Sales as a function of advertisement spending and dummy variables for 4 exhaustive regions (North, South, East and West), what specification would imply a dummy variable trap? What is the solution?
2. What is Variance-Inﬂating Factor (VIF)? How is the Variance-Inﬂating Factor used to detect multicollinearity?
3. A researcher is interested in understanding how wage is affected by being part of a union. In addition, she is interested in finding if being a union member affects wage differently for male and female. Can an interaction model be used for this analysis? Explain.

**Part C**

**Answer any Two of the following questions (2x10)**

1. What are the consequences of using ordinary least squares in the presence of autocorrelation? Explain the Durbin-Watson test to detect autocorrelation. What is the remedial measure for first-order autocorrelation?
2. Prove that OLS estimators are best linear unbiased estimators.
   1. State and explain the assumptions of the Classical Linear Regression Model (CLRM).
   2. Suppose that ***u*** is independent of the explanatory variables, and it takes on the values ***-2, -1, 0, 1, 2*** with an equal probability of ***1/5.*** Does this violate the Gauss-Markov assumptions? Does this violate the CLRM assumptions?