ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-27
MA ECONOMICS – III SEMESTER
SEMESTER EXAMINATION: NOVEMBER 2020
EC9418: BASIC ECONOMETRICS

Time- 2 ½ hrs

Max Marks-70

This paper contains TWO printed page and THREE parts

PART A Answer any FIVE of the following

2 X5=10

1. Use simple regression framework to explain the error term and the residual.
2. What is R^2 ?
3. Consider the following predicted regression line: $\widehat{Marks}$= 698.9 + 2.28 *Hours, where Hours is the hours studied. Interpret the slope coefficient.
4. What is the interpretation of β_1 for this model: $\ln(Y_i) = \beta_0 + \beta_1 X_i + u_i$?
5. What is dummy variable trap?
6. Explain the joint-test orthe compound test.
7. Give an example of a non-linear model that CANNOT be linearized to conduct OLS.

PART B Answer any THREE of the following

10x 3=10

8. Discuss two potential strategies to reduce variance of an estimator.

9. In this regression $p_i = \beta_0 + \beta_1 w_i + u_i$ how do we test $H_o: \beta_1 = 1$? Describe the general process, including what distribution and test statistic would be used (You don't need t-tables).

10. Your data has weight and height from 29 female and 81 male students at your university. You also know the number of siblings they have. You consider a new theory that children who have more siblings come from poorer families and will have to share the food on the table. You decide to hypothesize that peers with many siblings will weigh less, on average, for a given height. In addition, you believe that the muscle/fat tissue composition of male bodies suggests that females will weigh less, on average, for a given height. To test these theories, you perform the following regression:

$\widehat{Studentw}$ = - 229.92 – 6.52 *Female + 0.51 *Sibs+ 5.58 *Height, R^2=0.50

where Studentw is weight in pounds, Height is in inches, Female takes a value of 1 for females and is 0 otherwise, Sibs is the number of siblings.

 a. Does the intercept make sense?

 b. Interpret the coefficients and the R^2

11. Graphically show the difference between the following models (X is a continuous variable and D a dummy variable):

 a. $Y = \beta_0 + \beta_1 X + \beta_2 D + u$

 b. $Y = \beta_0 + \beta_1 X + \beta_2 D + \beta_3 (X * D) + u$

 c. $Y = \beta_0 + \beta_1 X + \beta_2 (X * D) + u$

12. What is multicollinearity? Suggest potential ways to deal with it.

PART C Answer any TWO of the following   15 X2=30

13. If a variable should be included in the model but is not, there is omitted variable bias. Consider the true model which includes X_1 and X_2 but the estimated model excludes one of these variables. Derive the Omitted Variable Bias and give the intuition for the bias.

14. In a regression of the rate of growth of employment on the rate of growth of real GDP using a sample of 31 OECD countries, $R^2 = 0.2837$. The F-test of the goodness of fit can be calculated as $F = \frac{ESS/k-1}{RSS/n-k-1}$ where n is the number of observations and k the number of parameters excluding the intercept term. ESS stands for Explanatory Sum of Squares and RSS for Residual Sum of Squares. Calculate the corresponding F statistic for the model above with the given information.

15. What is heteroscedasticity? Suggest possible remedies both when the form of heteroscedasticity is unknown as well as when it is known.

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