Indian Institute of Technology Kharagpur
Department of Humanities and Social Sciences

Assignment-I Full Marks: 20
Submission Timeline: 05/02/2022 (Saturday) 1:00pm
Subject No: HS20202/HS41002 Subject Name: Econometric Analysis I

Instructions: Answer all the questions. Submit the Answer Script within the given timeline in MS Teams only. Submission through email will not be considered.

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1. Comment on the following statements with justification/proof/empirical supports: 2×2=4

   (a) The problem of multicollinearity is of both *existence* as well as *severity*.

   (b) The *goodness-of-fit* of a bivariate regression model will not differ depending on whether we include or exclude the intercept.

2. Consider three uncorrelated variables X_1, X_2 and X_3 with each having the same standard deviation σ. Find out the correlation coefficient between $Z_1 = X_1 + X_2$ and $Z_2 = X_2 + X_3$. Derive the OLS estimator of the regression coefficient if Z_1 is regressed on Z_2.

   4

3. Consider the following two models:

   (a) $\ln(Y_i^*) = \alpha_1 + \alpha_2 \ln(X_i^*) + u_i$ with $Y_i^* = w_1 Y_i$ and $X_i^* = w_2 X_i$; (b) $\ln(Y_i) = \beta_1 + \beta_2 \ln(X_i) + v_i$
   Examine how the OLS estimators of the regression coefficients and their standard errors differ between these two models. Will there be any difference in the value of R^2?

   4

4. Suppose you are interested to identify the factors that influence variations in inflows of industrial investment across the Indian states. Specify the regression model that can be estimated for this purpose. Discuss how the variables will be measured along with their expected impact on the dependent variable. What steps will you follow to estimate this model and interpret the regression results?

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