Indian Institute of Technology Kharagpur
Department of Humanities and Social Sciences
Five-Year Integrated M.Sc. in Economics
Second Class Test (Autumn Semester: 2021-22)
Subject: Econometric Analysis II (HS40007)

Time: 1hr **Full Marks 20** **Date: 04 October 2021**

(Instructions: Answer all the Questions; Submit the handwritten and signed Answer Script in PDF in MS Teams only; No late submission of the Answer Script or its submission through email will be considered.)

Part-I: Select the most appropriate alternative for the following: $1 \times 5 = 5$

1. The first difference of the logarithm of Y_t equals:
   A) The first difference of Y
   B) The difference between the lead and the lag of Y
   C) Approximately the growth rate of Y when the growth rate is small
   D) Exactly the growth rate of Y

2. If a variable (X) Granger causes another variable (Y):
   A) Variable X is exogenous
   B) Variable X is not exogenous
   C) Variable X is endogenous
   D) Variable X is not endogenous

3. A major problem with a distributed lag models is that:
   A) R-square is low
   B) Coefficient estimates are biased
   C) Variances of the coefficient estimates are large
   D) It is impossible to determine the lag length

4. The purpose of "augmenting" the regression for the Dickey-Fuller test is to:
   A) Ensure that there is no heteroscedasticity in the residuals
   B) Ensure that the test there is no autocorrelation in the residuals
   C) Ensure that the regression residuals are normally distributed
   D) Ensure that all aspects of the non-stationarity are taken into account

5. Which of the following is not a necessary condition for a weakly stationary time series?
   A) Mean is constant and does not depend on time
   B) Autocovariance function depends on s and t only through their difference |s-t| (where s and t are moments in time)
   C) The time-series under consideration is a finite variance process
   D) The time-series is Gaussian

Part II: Comment on the following statements with justification: $3 \times 2 = 6$

1. The 'Granger causality test' is a test of precedence rather than a test of causality.

2. Application of the Koyck transformation procedure in a distributed lag model does not make much sense if some of the lag coefficients are positive and the rests are negative.

Part-III: Answer the following questions:

1. Consider the model $Y_t = e^{\alpha}(X_t^*)^{\beta} e^{u_t}$ where Y_t and X_t^* stand for investment on machinery and expected sales respectively. If X_t^* is not observable and the rule of adaptive expectation is followed, derive the regression equation that can be used to estimate the parameters of the model using the given data on X_t and Y_t. Can the derived model be estimated by applying the OLS method? Justify your answer.

   3

2. Draw an appropriate schematic (flow) diagram to show the process to be followed while carrying out the stationarity test of a variable using alternative functional forms.

   3

3. Explain how the ADF test is different from the DF-GLS test. Which test would you prefer to apply and why?

   3
