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INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

Date: September 2015 FN/AN

Humanities & Social Sciences Department

Mid Autumn Semester Examination 2015

Subject No. HS40007 Econometric Analysis II

Fourth Year M.Sc. (Economics)

Time: 2 hours

Full Marks: 50 marks

Answer *all* questions

1. Write a short note on the Holt-Winters smoother.

OR

Briefly explain what TGARCH models are. When should we use such models? [6]

2. State the Wold Decomposition Theorem. Show how this theorem may be used to generate an AR(2) series. Derive the values of γ_0, γ_k and ρk, when these terms represent auto-covariance of order zero, auto-covariance of order k and auto-correlation of order k, respectively. [12]

3. Derive the autocorrelation function (ρ) for an AR(1) process. What will be the values of ρ_1, ρ_2 and ρ_3 for the model $y_t = 0.8y_{t-1} + e_t$? [10]

4. In what sense are MA processes dual of the AR processes. Prove that an AR(1) process can be represented as an infinite order MA process. [6]

5. Prove that memory of a MA(q) series will cut off after q periods. [8]

6. What is the form of the multiplicative ARCH model? For such models, prove that:

   (a) the unconditional expectation of ε_t is zero

   (b) the unconditional variance of ε_t is constant [8]