

MASTER OF ARTS EXAMINATION, 2023

(1st Year, 2nd Semester)

ECONOMICS**[ECONOMETRICS AII]**

Time : Two Hours

Full Marks : 30

Answer any two questions

1. Consider the following two-equation model:

$$y_1 = \gamma_1 y_2 + \beta_{11} x_1 + \beta_{21} x_2 + \beta_{31} x_3 + \varepsilon_1$$

$$y_2 = \gamma_2 y_1 + \beta_{12} x_1 + \beta_{22} x_2 + \beta_{32} x_3 + \varepsilon_2$$

- a. Are all the equations of the above model identified?
 b. Establish whether or not the following restrictions are sufficient to identify (or partially identify) the model:

(i) $\beta_{12} = \beta_{22} = 0$

(ii) $\beta_{32} = 0$ and $\gamma_2 = 0$

(iii) $\beta_{21} + \beta_{31} = 1$

- c. Now imposing the restriction $\beta_{32} = 0$ & $\beta_{21} = 0$ estimate the structural form parameters of the above model using the appropriate method of estimation. Justify why you have chosen that particular method of estimation. 1+2+3+3+5+1=15

2. a. If errors are independent over time but correlated across cross section units then what is the appropriate method of estimation. Discuss the method by considering a suitable model.
 b. Discuss the assumptions of the fixed effects and the random effects models and the issues related to the choice between these models.

3. a. Compute the autocorrelation function of the following AR(2) process and plot their correlograms: 6+6+3=15

$$X_t = 0.9X_{t-1} - 0.2X_{t-2} + \varepsilon_t$$

- b. What are the null and alternative hypotheses in unit root tests?

- c. Consider a ARMA(2,2) model and discuss how will you estimate that ARMA model. (3+1)+5+6=15