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Register Number:

DATE:

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

**M.A. ECONOMICS- IV SEMESTER**

**SEMESTER EXAMINATION: APRIL 2020**

**EC 0118: ADVANCED ECONOMETRICS**

**Time: 2.5 Hours Maximum Marks-70**

**This question paper has 2 printed page and 3 parts**

**Part A. Answer any five of the following: 2 X 5=10**

1. Give the economic justification of using the distributed lag model. Write the general form of infinite lag model with one explanatory variable.
2. What is odds-ratio?
3. What is a co-integrated process?
4. What is Granger causality?
5. What two conditions must an instrument variable (IV) satisfy?
6. Write an AR(p) model.
7. What method is used to estimate a Logit or Probit model? Give two desirable properties of these estimators.

**Part B. Answer any three of the following: 10 X 3 =30**

1. Describe the ARIMA (Box-Jenkins) method for estimating time-series data.
2. Write a note on error correction model (ECM).
3. Inventories (Y) depend on the Sales (X) for preceding 3 years i.e. $Y\_{t }= α+ β\_{0 }X\_{t }+β\_{1 }X\_{(t-1)}+ β\_{2}X\_{(t-2) }+ β\_{3}X\_{(t-3) }+u\_{t}$ . Assume $β\_{i }$can be approximated by $β\_{i }= a\_{1 }+a\_{2 }.i +a\_{3}.i^{2}$
* What are the constructed variables we will use in the estimating equation?
1. Describe the Hausman test which can be used to test for simultaneity and is often used to test for endogeneity.
2. Panel data includes data for same unit for several periods. Describe the fixed effects methodology and its benefits.

**Part C. Answer any two of the following: 15 X 2 =30**

1. The Adaptive Expectations for X is given by: $(X\_{t}^{\* }-X\_{t-1}^{\* }) =γ (X\_{t}^{ }-X\_{t-1}^{\* })$. We want to model the outcome variables as $Y\_{t }= α+ β\_{ }X\_{t}^{\* }+u\_{t}$where all the starred terms ($X\_{t}^{\* })$ are expectations and not observable.
	1. How do we estimate $β$?
2. Consider the following simultaneous equation model for demand and supply of butter:

$$Q\_{t}^{d}= β\_{0}+ β\_{1}Price+β\_{2}Income+u\_{1t}$$

$$Q\_{t}^{s}= β\_{0}+ β\_{1}Price+u\_{2t}$$

* 1. Briefly describe why we have a simultaneity problem.
	2. Write the Reduced form equations.
	3. Using order condition, check if either equation identified. Is it over- or exactly-identified?
	4. Describe the Probit model.

b. Mortgage denial (deny) is explained using Payment-to-income ratio (PI ratio) and race (Black). We get the following fitted result:

$$\hat{Deny}= F\left(-4.13+5.37\*PI ratio+1.27 Black\right)$$

* Describe what we can say about the qualitative impact of PI ratio.
* Describe the procedure to calculate the denial probability of a Black applicant with PI ratio of 0.3 (you don’t need to calculate the value)