

## FOURTH SEMESTER M.A. DEGREE EXAMINATION, MARCH 2020

(CUCSS)

Economics

ECO 4C 15—ADVANCED ECONOMETRICS

Time : Three Hours

Maximum : 36 Weightage

## Part A

*Answer all questions.**Each bunch of four questions carries a weightage of 1.*

1. Which of the following is not used to detect equation specific errors ?
  - (a) DW test.
  - (b) RESET test.
  - (c) Lagrange Multiplier test.
  - (d) Geary test.
2. In the matrix representation of the regression model,  $y_{n \times 1} = X_{n \times k} \beta + u_{n \times 1}$  where the subscripts are the order of the matrix, what should be the order of the coefficient vector  $\beta$  so that the equation is defined ?
  - (a)  $n \times 1$ .
  - (b)  $k \times 1$ .
  - (c)  $k \times n$ .
  - (d)  $n \times k$ .
3. In the autoregressive model  $Y_t = \rho Y_{t-1} + u_t$  when  $\rho = 1$  the model is known as :
  - (a) MA model.
  - (b) Granger model.
  - (c) Random walk model.
  - (d) ARMA model.
4. Which of the following is not used for handling models with dichotomous dependent variables ?
  - (a) LPM model.
  - (b) Probit model.
  - (c) Tobit model.
  - (d) SUR model.
5. Given the distributed lag model,  $Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \dots + \beta_k X_{t-k} + u_t$  the coefficient  $\beta_0$  is known as the :
  - (a) Impact multiplier.
  - (b) Intermediate multiplier.
  - (c) Total multiplier.
  - (d) None of (a), (b) and (c).

6. For detecting autocorrelation in autoregressive models, the test used is :
- (a) DW statistic. (b) DF statistic.  
(c) ADF statistic. (d) Durbin  $h$  statistic.
7. In the stock adjustment model  $Y_t - Y_{t-1} = \delta(Y^*_t - Y_{t-1})$  the range of the coefficient of adjustment,  $\delta$  is :
- (a)  $0 \leq \delta \leq 1$ . (b)  $0 < \delta \leq 1$ .  
(c)  $0 \leq \delta < 1$ . (d)  $0 \leq \delta$ .
8. The procedure for estimating the structural coefficients from the estimated reduced form coefficients is known as :
- (a) Ordinary least squares. (b) Two stage least squares.  
(c) Indirect least squares. (d) Root mean squares.
9. As a good rule of thumb one can suspect that the estimated regression is spurious if the coefficient of determination  $R^2$  and the Durbin-Watson statistics  $d$  are related as :
- (a)  $R^2 < d$ . (b)  $R^2 > d$ .  
(c)  $R^2 = d$ . (d)  $R^2 \leq d$ .
10. In the model,  $M_t = \alpha_0 R_t^{\alpha_1} Y_t^{\alpha_2} e^u$  where  $M_t$  is demand for money,  $R_t$  the long-run interest rate and  $Y_t$  real GDP, the elasticity of money demand w.r.t interest is :
- (a)  $\alpha_1/M_t$ . (b)  $\alpha_1$ .  
(c)  $\alpha_1 \frac{\partial M_t}{\partial R_t}$ . (d)  $\alpha_1 + \alpha_2$ .
11. "A test of cointegration can be thought of as a pre-test to avoid \_\_\_\_\_".
- (a) Ridge regression. (b) Step-wise regression.  
(c) Spurious regression. (d) Logistic regression.
12. If more than one numerical value is obtained for some of the parameters of the structural equations from reduced form equations the system is :
- (a) Over identified. (b) Just identified.  
(c) Under identified. (d) Identified.

**Part B**

*Answer any five questions.*

*Each question carries a weightage of 1.*

13. What do you mean by trend and break ?
14. Distinguish between trend stationary process and difference stationary process.
15. What are the methods to determine the lag length in distributed lag model ?
16. Compare and comment on the Logit and Probit models.
17. What is stochastic stationary process ?
18. What is Ramsey's RESET test ?
19. What is Dicky-Fuller unit root test ? Explain.
20. Distinguish between ARMA and ARIMA models.

(5 × 1 = 5 weightage)

**Part C**

*Answer any eight questions.*

*Each question carries a weightage of 2.*

21. How do you test presence of unit root in a data set ?
22. Explain the drawbacks of ad hoc estimation of distributed lag models.
23. What is Instrumental Variable regression ? Explain the conditions to be satisfied by an instrument to be valid.
24. What is identification problem ? Explain the concept of over identification and under identification.
25. What do you mean by cointegration ? How can you tell whether two variables are cointegrated ?
26. What is a VAR model ? Explain.
27. Distinguish between DF and ADF test of unit root problem.
28. State the assumptions of distributed lag models.
29. What are the reasons for time lag in economics ? Explain.
30. Given the first order partial correlation co-efficient as  $r_{12.3} = \frac{r_{12} - r_{13}r_{23}}{\sqrt{(1-r_{13}^2)}\sqrt{(1-r_{23}^2)}}$ . What inferences can be drawn from the rule regarding the sign and value of zero-order correlation co-efficients ?
31. What do you mean by rank of a matrix ? Examine how the rank condition is used in.

(8 × 2 = 16 weightage)

**Turn over**

**Part D**

*Answer any three questions.*

*Each question carries a weightage of 4.*

32. Explain the following terms and concepts: (i) Panel data; (ii) Balance panel and unbalanced panel; (iii) Fixed effects regression model and (iv) Time effects regression model.
33. Discuss the Polynomial distributed lag model. Is it an improvement over Koyck model? Why?
34. What is simultaneous system? Explain the concepts: (i) structural form and reduced form equations (ii) identification. Given the system of equations,

$$C_t = \alpha_0 + \alpha_1 Y_t + u_{1t}$$

$$I_t = \beta_0 + \beta_1 Y_t + \beta_2 Y_{t-1} + u_{2t}, \text{ where } C_t, I_t, Y_t \text{ endogenous and } Y_{t-1}, G_t \text{ exogenous.}$$

$$Y_t = C_t + I_t + G_t$$

Obtain the reduced form equations.

35. "A test for cointegration can be thought of as a pre-test to avoid spurious regression situations" Expound the tests for cointegration.
36. Briefly examine the Box-Jenkins methodology for dealing with time series models.

(3 × 4 = 12 weightage)