Indian Institute of Technology Kharagpur
Department of Humanities and Social Sciences
Short Class Test (Quiz) Full Marks: 20 Time: 20mins Date: 28/03/2022
Subject No: HS20202/HS41002 Subject Name: Econometric Analysis I

Instructions: **Answer all the questions. Submit the Answer Script in PDF mentioning your name and roll no. within the given timeline in MS Teams only. Submission through email or late submission will not be considered.**

Select the most appropriate alternative for the following: $1 \times 20 = 20$

1. Which of the following may show presence of autocorrelation in an estimated model?
(i) Slowness of response of the dependent variable to changes in the independent variables
(ii) Over-reactions of the dependent variable to changes in the independent variables
(iii) Omission of relevant explanatory variables that are autocorrelated from the model
(iv) Presence of outliers in the data

(A) (ii) and (iv) only
(B) (i) and (iii) only
(C) (i), (ii) and (iii) only
(D) (i), (ii), (iii) and (iv)

2. If the method of OLS is used in the presence of autocorrelation:
(i) The OLS estimators of the coefficients may be misleading
(ii) Testing of hypotheses would result in wrong conclusions
(iii) Forecasts would be biased
(iv) Standard errors of the estimated regression coefficients would be inappropriate

(A) (ii) and (iv) only
(B) (i) and (iii) only
(C) (i), (ii) and (iii) only
(D) (i), (ii), (iii) and (iv)

3. Presence of negative autocorrelation is indicated by:
(A) A cyclical pattern in the residuals
(B) An alternative pattern in the residuals
(C) Complete randomness in the residuals
(D) Any of the above

4. One possible way to check for presence of autocorrelation informally is:
(A) Plotting residuals against the dependent variable and the independent variable(s)
(B) Plotting squared residuals against the dependent variable and the independent variable(s)
(C) Plotting residuals against the dependent variable only
(D) None of the above

5. If the Durbin-Watson *d* statistic in a regression model with two explanatory variables and 50 observations takes a value 1.53, the appropriate conclusion at 5 percent significance level is:
(A) There is positive autocorrelation
(B) There is negative autocorrelation
(C) There is no autocorrelation
(D) The test is inconclusive

6. The Durbin's *h* statistic follows:
(A) Standard normal distribution
(B) Chi-square distribution
(C) t distribution
(D) F distribution

7. The degrees of freedom in Breusch-Godfrey test for autocorrelation is equal to:
(A) The number of coefficients estimated
(B) The number of observations minus the number of regression coefficients
(C) The number of observations minus the number of explanatory variables
(D) The lag length (order of autocorrelation)

8. Consider the following statements:
(i) Null hypothesis in the Berenblutt-Webb Test is $H_0 : \rho = -1$
(ii) Null hypothesis in the Durbin-Watson d Test is $H_0 : \rho = 1$

(A) Only (i) is true
(B) Only (ii) is true
(C) Both (i) and (ii) are true
(D) Both (i) and (ii) are false

9. Which of the following are plausible approaches to deal with autocorrelation?
(i) Taking logarithms of each of the variables
(ii) Adding lagged values of the variables to the regression equation
(iii) Using dummy variables to remove the outlying observations
(iv) Estimating a model in first differenced form rather than in levels

(A) (ii) and (iv)
(B) (i) and (iii)
(C) (i), (ii), and (iii)
(D) (i), (ii), (iii), and (iv)

10. The null hypothesis that all the slope coefficients in a multiple regression model are simultaneously equal to zero is tested by using:
(A) Z-test
(B) t-test
(C) Chi-square test
(D) F-test

11. The validity of constant returns to scale in a production function can be tested by using:
(A) Both Z-test and t-test
(B) Only t-test
(C) Only F-test
(D) Both t-test and F-test

12. In testing equality of coefficients of any two independent variables in a multiple regression model with 5 explanatory variables, the degrees of freedom of the t-statistic will be:
(A) N-2
(B) N-5
(C) N-6
(D) None of the above

13. The value of the ordinary R^2 in an unrestricted model is:
(A) Always greater than that of the restricted model
(B) Always less than that of the restricted model
(C) Always equal to that of the restricted model
(D) Either greater than or equal to that of the restricted model

14. For the regression model $Y_i = \alpha_1 + \alpha_2 X_i + \alpha_3 D_i + \alpha_4 (D_i * X_i) + u_i$, if α_4 is significant and α_3 is not, the two PRFs will be
(A) Coincident
(B) Concurrent
(C) Parallel
(D) Dissimilar

15. For the consumption function $Y_i = \alpha_1 + \alpha_2 X_i + \alpha_3 D_i + \alpha_4 (D_i * X_i) + u_i$ with $D_i = 0$ for rural households and $D_i = 1$ for urban households, if α_4 is significant and negative but α_3 is significant and positive, the urban households have:
(A) Higher marginal propensity to consume and higher autonomous consumption expenditure
(B) Lower marginal propensity to consume and lower autonomous consumption expenditure
(C) Higher marginal propensity to consume but lower autonomous consumption expenditure
(D) Lower marginal propensity to consume but higher autonomous consumption expenditure

16. The different components of a time-series are:
(A) Always in additive form
(B) Always in multiplicative form
(C) May be in additive or multiplicative form
(D) None of the above

17. Inclusion of lagged values of the dependent variable on the right hand side of a regression equation can cause OLS estimators of coefficients to be:
(A) Biased but consistent
(B) Biased and inconsistent
(C) Unbiased but inconsistent
(D) Unbiased and consistent but inefficient

18. Which following model(s) can be estimated by applying the method of OLS?

(i) $Y_i = \beta_o + \beta_1 X_{1i} + \beta_2 (2X_{1i}) + u_i$

(ii) $Y_i = \beta_0 + \beta_1^2 X_1 + u_i$

(iii) $Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 (X_{1i})^2 + u_i$

(A) Model I and II
(B) Model II and III
(C) Model III only
(D) Model I only

19. In order to capture six different categories of an explanatory variable, one should use:
(A) Six different dummies for each of the categories without with the intercept
(B) Five different dummies for each of the categories along with the intercept
(C) Either (A) or (B)
(D) None of the above

20. In a regression model, if the random disturbance term is normally distributed, its estimated variance will follow:

(A) Chi-square distribution
(B) Standard normal distribution
(C) t distribution
(D) F distribution

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