4/82

1304E029

Candidate's Seat No :_____

M.Sc. Sem-4 Examination

508

Statistics

April 2022

Time : 2-00 Hours] **[Max. Marks : 50**

Instruction: All questions in **Section-I** carry equal marks.

Attempt any **Three** questions in **Section-I**.

Question 9 in **Section-II** is **COMPULSORY**.

Section-I

Q. 1 (A) Discuss k-variable linear regression model. Stating basic necessary assumptions obtain OLSE for the parameter involved in the model. [07]

(B) Discuss, how will you test normality in multiple regression model? [07]

Q. 2 What is multicollinearity? Discuss, how will you detect multicollinearity? [14]

Q. 3 What is heteroscedasticity? Discuss how grouping of observations creates heteroscedasticity? [14]

Q.4 (A) Discuss: (a) Park Test (b) Glejser Test [07]

(B) Discuss Breusch-Pagan-Godfrey (BPG) test. [07]

Q.5 (A) Define Autocorrelation. Explain different types of patterns & interpret them. [07]

(B) Why Autocorrelation occurs? State Reasons and Remedies. [07]

Q. 6 (A) State Methods of detecting Autocorrelation. Explain Durbin Watson Test. [07]

(B) State the limitations of LPM for Predicting Dichotomous Dependent Variables. [07]

Q.7 (A) When logistic regression is used? Explain the logit model. [07]

(B) Explain simultaneous equation models with an example of the Keynesian model of income determination. [07]

Q.8 (A) Explain the identification problem. [07]

(B) Explain the two-stage least square method (2SLS). [07]

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Section-II

Q.9 Answer any eight. [08]

1. A regression model in which more than one independent variable is used to predict the dependent variable is called
A. a simple linear regression model
B. a multiple regression model
C. an independent model
D. none of the above

2. A term used to describe the case when the independent variables in a multiple regression model are correlated is
A. regression
B. correlation
C. multicollinearity
D. none of the above

3. A multiple regression model has the form: $y = 2 + 3x_1 + 4x_2$. As x_1 increases by 1 unit (holding x_2 constant), y will
A. increase by 3 units
B. decrease by 3 units
C. decrease by 4 units
D. increase by 4 units

4. A measure of goodness of fit for the estimated regression equation is the
A. multiple coefficient of determination
B. mean square due to error
C. mean square due to regression
D. none of the above

5. Which of these tests require reordering the observations with respect to the X variables that supposedly caused heteroscedasticity
A. Goldfield Quand F test
B. Breusch-Pagan-Godfrey test
C. White's test
D. all of the above

6. Which of these is not a symptom of multicollinearity in a regression model
A. High R^2 with few significant t ratios for coefficients
B. High pair-wise correlations among regressors

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C. High R^2 and all partial correlation among regressors
D. VIF of a variable is below 10

7. Multicollinearity is essentially a
A. sample phenomenon
B. population phenomenon
C. Both (A) and (B)
D. neither (A) nor (B)

8. Hetroscedasticity is more likely a problem of
A. Cross-section data
B. Time series data
C. Pooled data
D. all of the above

9. Condition for autocorrelation is _____
A. $E(u_i u_j) = 0$,
B. $E(u_i u_j) < 0$.
C. $E(u_i u_j) > 0$.
D. $E(u_i u_j) \neq 0$

10. The value of d statistics Lies between _____ .
A. [-1 , 1] ,
B. [-4, 0].
C. [0, 4] .
D. [-4. 4]

11. In Logistic Regression, $\frac{P_i}{(1-p_i)}$ is known as _____ .
A. Probability
B. Odds Ratio
C. Logit
D. LPM

12. For exactly identifiable equations and over identifiable equations _____ method is used.
A. Indirect Least Square Method.
B. Two Stage Least Square Method
C. Least Square Method
D. Any of the Above

P.T.O

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13. OLS estimates of the series with autocorrelation is
A. unbiased
B. efficient
C. inefficient
D. sufficient

14. The first difference transformation to eliminate autocorrelation assumes $\rho =$ _____
A. -1
B. 1
C. > -1
D. < 1

15. If equation is not identified which method is used?
A. recursive
B. ILS
C. 2SLS
D. No method

16. There is no such thing as R^2 in simultaneous equation model as a whole.
A. yes
B. No
C. Can't say