LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – STATISTICS

SECOND SEMESTER – APRIL 2017

ST 2817- CATEGORICAL DATA ANALYSIS

Date: 03-05-2017   Dept. No.   Max. : 100 Marks
01:00-04:00

Section –A

Answer all the questions   **(10 x 2 = 20)**

1. Define Regression model.
2. What is an explanatory variable?
3. Define β_0 and β_1 in simple regression model.
4. What is the purpose of R^2?
5. Give the formula for Durbin Watson d Statistic.
6. Define Multicollinearity.
7. What is the dummy variable rule?
8. Define an outlier.
9. Define Lag variable.
10. Differentiate MAE and MAPE.

Section –B

Answer any five questions   **(5 x 8 = 40)**

11. Write short notes on applications of Econometrics.
12. What is the Variance-Inflating Factor (VIF)? How is the Variance-Inflating Factor used to detect Multicollinearity?
13. Explain the various problems involved in constructing multiple regression models.
14. Find the value of R^2 for following data

Y	11	8	9	7	6
X_1	6	4	5	5	3
X_2	3	7	5	6	8

15. Explain any two use of Residual analysis.
16. Explain the use of a dummy variable in a interactive form. Illustrate with an example.
17. Define Outlier and explain any two methods to detect outliers.
18. Give three reasons for Heteroscedasticity. Briefly explain.

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Answer any two questions   **(2 x 20= 40)**

19. Derive BLUE for Regression coefficient in multiple regression models.

20. Consider the following data

y	13	17	15	12	14	16	17	14	18	21	13	12	15
x	13	14	19	10	14	13	15	23	25	22	12	13	23

     i.   Obtain the regression equation **y** on **x**

     ii.   Test the significance of the parameters at 1 % level of significance.

     iii.   Find the value of y if **x** is 35.

21. Explain the procedure for testing the significance of the regression coefficient and testing the hypothesis for over all fitness of the model using ANOVA.

22. a) Explain and illustrate the Durbin-Watson test to detect autocorrelation.
    b) Explain the nature of autocorrelation. Illustrate typical patterns of autocorrelation in a couple of diagrams, and compare to absence of autocorrelation.(10+10)

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