LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – STATISTICS

FIFTH SEMESTER – NOVEMBER 2018

16UST5MC02/ ST 5509 –REGRESSION ANALYSIS

Date: 30-10-2018   Dept. No.   Max. : 100 Marks
Time: 09:00-12:00

PART - A

Answer ALL the questions. [10 x 2 = 20]

1. Differentiate between the mathematical & Statistical equations of a Simple Linear Regression Model.

2. Interpret the slope and Intercept of a Simple Linear Regression Model.

3. Explain the need for Model diagnostics.

4. Define Mean Predicted Value.

5. What are the assumptions used in a regression model?

6. Define MAE & MAPE.

7. Give an example of a Dummy Variable.

8. Explain the term "Outlier"

9. Define Multicollinearity.

10. Explain the term "Homoscedasticity" .

PART - B

Answer Any FIVE questions. [5x8 = 40]

11. Derive the least squares estimators of the parameters of Simple Linear Regression Model.
12. Differentiate between R^2 & adjusted R^2 explaining their interpretation.

13. Explain the Kolmogorov-Smirnov test for residuals.

14. Describe the QQ-plot & PP-plot.

15. Obtain the estimator of error variance σ^2 for the Multiple Linear regression Model.

16. Describe the Test for significance of Individual Regression Coefficients of a Simple

Linear regression Model.

17. Discuss the use of dummy variables in regression analysis.

18. Fit a regression line relating "Systolic Blood Pressure" to "Weight" from the following data:

Subject	1	2	3	4	5	6	7
Weight	165	167	180	155	212	175	190
SystolicBP	130	133	150	128	151	146	150

PART - C

19. (a) Show that the least squares estimators of Simple Linear regression Model are unbiased

(b) Derive the $100(1-\alpha)\%$ confidence interval for regression coefficients of a Simple Linear Regression Model.

20. (a) Describe three methods of Scaling Residuals along with its interpretation.

(b) Discuss the test for overall significance of a Multiple Linear regression Model

21. (a) Explain the diagnostic test for Muticollinearity using Variance Inflation Factor.

(b) Explain the Anderson-Darling test for regression model diagnostics.

22. Fit a Multiple Linear Regression model to the data given below & test for its overall significance.

Job Satisfaction measure (Y)	45	35	35	40	55	50	38	55
Supervisor's Score (X_1)	39	40	40	42	45	43	44	47
Employee Self Confidence score (X_2)	51	51	55	57	57	61	65	64

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