LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **STATISTICS**

FIFTH SEMESTER – **APRIL 2016**

ST 5509 – REGRESSION ANALYSIS

Date: 29-04-2016 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

PART A

Answer ALL the questions. **(10 x 2 = 20)**

1. Define regression.
2. State the assumptions used in linear regression model.
3. What is the function of a QQ plot?
4. Give the test statistic of Anderson – Darling.
5. Write the formula for mean absolute error (MAE).
6. Define multiple linear regression model.
7. What is an outlier?
8. What is a dummy variable trap?
9. What is the assumption of homoscedasticity?
10. What is multicollinearity?

PART B

Answer any FIVE questions. **(5 x 8 = 40)**

11. Fit a straight line to the following data using least square method.

Values	10	20	30	40	50	60	70
Frequency	1	5	12	22	17	9	4

12. Explain PP plots in detail.
13. An incomplete ANOVA table for a regression model $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \square$ is given below:

Source	d.f	SS	MSS	F ratio
Regression	-	345	-	2.67
Error	21	-	-	
Total	24			

Complete the table.

14. What are the different methods of diagnosing the problem of multicollinearity?
15. Explain the merits and demerits of using partial regression coefficients.
16. Explain the concept of varying intercept and slope using dummy variables.
17. What is the procedure for constructing a confidence interval for β coefficients and $\hat{Y}$.
18. Explain multiple linear regression model in detail with example.

PART C

Answer any TWO questions. **(2 x 20 = 40)**

19. a) How does one detect and remove outliers from a given data?

    b) Explain the assumptions of a linear regression model in detail.

20. Fit a regression model for the given data:

No.	Y	X_1	X_2
1	45	5	1
2	55	6	2
3	65	7	1
4	70	8	2
5	60	4	3
6	58	3	2
7	62	3	4
8	75	5	1

    Carry out the F – test for the regression model.

21. a) Explain the test for testing significance of the model coefficients.

    b) Explain the Anderson Darling test and Kolmogorov – Smirnov Test.

22. Explain residual plots in detail.

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