

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – STATISTICS**

FIRST SEMESTER – NOVEMBER 2007

**ST 1811 - APPLIED REGRESSION ANALYSIS**

BB 9

Date : 02/11/2007  
Time : 1:00 - 4:00

Dept. No

Max. : 100 Marks

**SECTION A**

**Answer ALL the questions Each question carries 2 marks (10 X 2 =20 Marks)**

- 1) What is coefficient of determination?
- 2) What is the difference between R-square and adjusted R-square?
- 3) Write down the expression for the adjusted R-square in terms of MSResidual and SSTotal
- 4) What is the purpose of dummy variable?
- 5) What is unit normal scale?
- 6) What are the four methods of scaling residuals?
- 7) Explain multicollinearity.
- 8) Why do regression coefficient have a wrong sign?
- 9) Write short note on multiple logistic regression model.
- 10) What is the purpose of residual analysis?

**SECTION B**

**Answer any 5 questions Each question carries 8 marks (5 X 8 = 40 Marks)**

- 11) Derive the estimate of the parameters of a linear regression model using the method of Maximum likelihood.
- 12) Write short note on the confidence interval of the regression coefficient of a multiple regression model.
- 13) Write short note on dummy variables in a practical situation.
- 14) Explain the binomial logit model in the applied context.
- 15) Establish the relationship between the unit normal scaling and the unit length scaling.
- 16) Explain multinomial regression in detail with examples.
- 17) Write short note on the residual plot.
- 18) What is the role of ANOVA in the light of a linear regression model?

**SECTION C**

**Answer any 2 questions Each question carries 20 marks (2 X 20 = 40 Marks)**

- 19 a) How do you write the distribution of a transformed mean of a response variable in Binomial logit model in the natural exponential family form. (10 Marks)
- 19 b) Write short note on the confidence interval of the mean response of a multiple regression model. (10 Marks)
- 20 a) Job satisfaction of the employees of a company is categorized in to 1. Not satisfied 2. A little satisfied 3. Satisfied and 4. Very much satisfied. Construct a multinomial model for regressing job satisfaction on income and the gender. (10 Marks)
- 20 b) Explain the regression model of the status of the employees on the education and income level in the context of the usage of a dummy variable. (10 Marks)
- 21 a) Explain the concept of multi collinearity in the context of regression delivery time of and item on the distance traveled and the gasoline consumed. (10 Marks)
- 21 b) Explain the four methods for scaling residuals bringing out the relationship between them. (10 Marks)
- 22 a) Bring out the relationship between the logit and probit models (10 Marks)
- 22 b) What are the three components specified in a generalized linear model? Explain in detail. (10 Marks)

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