



LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – STATISTICS

FIFTH SEMESTER – NOVEMBER 2024

UST 5503 – REGRESSION ANALYSIS



Date: 14-11-2024

Dept. No.

Max. : 100 Marks

Time: 09:00 am-12:00 pm

SECTION A - K1 (CO1)

	Answer ALL the Questions	(10 x 1 = 10)
1.	Define the following	
a)	Mean Absolute Percentage Error.	
b)	Residual.	
c)	Multiple Linear Regression Model.	
d)	Dummy Variable.	
e)	Binary Logistic Regression.	
2.	Fill in the blanks	
a)	In Simple Linear regression model the error terms are assumed to be _____.	
b)	A non Linear model can be linearized by using suitable _____.	
c)	A multiple regression model has more than one _____ variable.	
d)	_____ occurs when two or more explanatory variables in a regression model are highly correlated.	
e)	In binary logistic regression the dependent variable consist of _____.	

SECTION A - K2 (CO1)

	Answer ALL the Questions	(10 x 1 = 10)
3.	True or False	
a)	The coefficient of determination lies between -1 and +1.	
b)	The difference between the actual Y value and the predicted Y value found using a regression equation is called multicollinearity.	
c)	Adjusted R square measure the proportion of variation explained by only those explanatory variables that help in explaining the dependent variable.	
d)	The variance inflation factor is the most common method for detecting multicollinearity.	
e)	Logistic regression predicts the output of an interval scale dependent variable.	
4.	Answer the following	
a)	Define slope of the regression.	
b)	List any two assumptions on error term.	
c)	Write the data matrix of Multiple Linear Regression model.	
d)	Define multicollinearity.	
e)	List the different types of logistic regression.	

SECTION B - K3 (CO2)

	Answer any TWO of the following in 100 words each.	(2 x 10 = 20)
5.	Show that least square estimators of slope and intercept are unbiased.	
6.	Explain Kolmogorov Smirnov test for residuals.	
7.	Obtain $\hat{\beta}$ in multiple linear regression model.	

8.	Discuss the causes of multicollinearity.
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SECTION C – K4 (CO3)

Answer any TWO of the following in 100 words each.

(2 x 10 = 20)

9.	Discover the procedure of Anderson Darling Test.								
10.	Explain ROC curve.								
11.	Discover the test procedure for testing the subset of regression coefficients equal to zero.								
12.	Find Slope and intercept for the following data:								
	Y	68	78	73	85	82	79	90	90
	X	92	55	68	67	65	70	66	75

SECTION D – K5 (CO4)

Answer any ONE of the following in 250 words

(1 x 20 = 20)

13.	Explain (i) Model with interaction term involving Dummy variables. (ii) QQ plots and PP Plots.								
14.	Find MAE and MAPE for the following data:								
	Year	2005	2006	2007	2008	2009	2010	2011	2012
	Advertisement Expenditure (Rs '000)	12	15	15	23	24	38	42	48
	Sales (Rs lakh)	5	5.6	5.8	7	7.2	8.8	9.2	9.5

SECTION E – K6 (CO5)

Answer any ONE of the following in 250 words

(1 x 20 = 20)

15.	(i) Construct an estimator of σ^2 in multiple linear regression model. (ii) Elaborate on Variance inflation factor.
16.	Explain the concept of Binary Logistic regression model.

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