



Date: 03-11-2017

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

PART-A(10 x 2=20)

ANSWER ALL QUESTIONS.

1. Define linear regression model
2. What are the assumptions of linear regression model?
3. Differentiate between R^2 and adjusted R^2
4. Define serial correlation
5. What do you mean by Mean absolute Percentage error?
6. Define outliers
7. Give any two methods of detecting outliers
8. Define multicollinearity
9. What are the sources of Multicollinearity?
10. What is homoscedasticity?

SECTION B(5 X 8 = 40)

ANSWER ANY FIVE QUESTIONS.

11. Prove that the least square estimators for simple linear regression are unbiased.
12. Discuss hypothesis testing on the slope and intercept of a simple linear regression model
13. Explain in detail about the effect of outliers in linear regression models.
14. Explain PP plots
15. Explain the transformation of non linear models to achieve linearity
16. Explain in detail about dummy variable trap
17. Discuss the residual plots in linear regression model
18. Fit a simple linear regression for the following data and also find the error

Operator	1	2	3	4	5	6	7	8
Experience(X)	16	12	18	4	3	10	5	12
Performance Rating(Y)	87	88	89	68	78	80	75	83

SECTION C(2X 20 = 40)

ANSWER ANY TWO QUESTIONS.

19. (a) Derive the least square estimator of simple linear regression model
(b) Derive the $100(1-\alpha)\%$ confidence interval for regression coefficients in a simple linear regression model

20. Fit a linear regression using method of least squares and also test the model fit of the data

Y	10	7	5	8	11	16	12	14	16	16
X ₁	4	7	6	10	12	14	9	8	5	7
X ₂	10	11	8	5	2	6	9	3	10	12

21. (a) Discuss about partial regression plot and partial residual plot. (12marks)
(b) Explain variance inflation factor method of diagnosing multicollinearity. (8 marks)
22. Explain in detail methods of scaling residuals.
