SECTION-A (10 x 2 = 20)
Answer ALL the questions.   Each carries 2 marks.

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

2. Write the various assumptions in simple regression model.

3. Write any two differences between R square and adjusted R square.

4. Explain the need for Model diagnostics.
5. Interpret the slope and Intercept of a Simple Linear Regression Model.
6. What do you mean by Mean Absolute Percentage error?
7. Obtain the covariance matrix of the OLSE of the regression coefficients.
8. Interpret the following plot of the residuals against the fitted values.
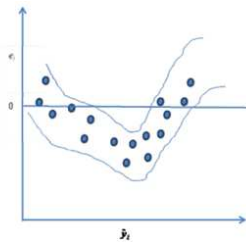
9. Write any two applications of Binary logistics Regression.

10. Discuss the purpose of dummy variable in regression model.

SECTION-B (5 x 8 = 40)
Answer any FIVE questions. Each carries 8 marks.

11. Explain the various steps involved in Regression analysis.
12. Using the OLS method, estimate the regression coefficients of multiple linear regression.

13. Describe the statistical testing procedure to test the significance of the regression co efficient.
14. Explain the various methods involved in scaling the residuals.

15. List down four transformations to stabilize variance in regression models and the different contexts for their use.

16. Draw the P-P plot for the following data.
        100, 98, 101, 93, 123, 112, 85, 76, 119, 111
17. Explain the various methods for detection of outliers.
18. What are possible reasons for Heteroskedasticity in a regression model?

19. (a) Using the OLS method, estimate the regression coefficients of simple linear regression.

(10)

(b) Write the testing procedure to check the adequacy of a multiple linear regression model.

(10)

20. Fit the regression model $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \varepsilon$ for the data given below and complete the ANOVA table. Also comment on your findings.

Score in the final Y	68	78	73	85	82	79	90	90
First Preliminary X1	92	55	68	67	65	70	66	75
Second Preliminary X2	79	75	81	89	84	79	81	82

21. (a) What is Multi collinearity? What are its consequences?   (10)

(b) Explain the measure to check the presence of multi collinearity based on partial regression with an example.   (10)

22. (a) Explain Binary Logistic Regression Analysis.   (10)
    (b) Explain Spearman's rank correlation test with an example.   (10)

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