



Q.1. Answer the following short questions: (6x5=30)

1. What is Chow test? Explain its usage.
2. How correlation analysis differs from regression analysis?
3. What are the assumptions of classical linear regression model?
4. What is the OLS criterion of best fitted line?
5. Explain  $R^2$  and adjusted  $R^2$ .
6. Differentiate between high and perfect multicollinearity.

Answer the following questions. (3x10=30)

Question 2

An economist is trying to establish the extent of the relationship between the amount earned by a taxpayer during the year and his charitable contributions which are tax deductible. A random selection of 9 tax returns are analyzed and the results are tabulated below. The income and contributions are expressed in lakhs of rupees.

|                   |     |     |     |     |     |     |     |     |      |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Y (Contributions) | 2.0 | 2.5 | 2.7 | 2.5 | 3.8 | 4.2 | 4.3 | 4.4 | 4.45 |
| X (Income)        | 25  | 29  | 32  | 32  | 40  | 43  | 50  | 55  | 57   |

- i. Compute values of regression coefficients and interpret estimated parameters.
- ii. For a person earning Rs. 65 lakhs per year, how much contribution do you expect him to make?

Question 3

Define Multicollinearity and discuss its consequences, detection methods and remedial measures.

Question 4.

From the following data find regression coefficients and test individual statistical significance of the coefficients.

|             |      |      |      |      |      |      |      |      |
|-------------|------|------|------|------|------|------|------|------|
| Year        | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
| Qd (Y)      | 100  | 75   | 80   | 70   | 50   | 65   | 90   | 100  |
| Price (X1)  | 15   | 17   | 16   | 16   | 18   | 17   | 15   | 14   |
| Income (X2) | 1000 | 600  | 1200 | 500  | 300  | 400  | 1300 | 1100 |