

Questions to prepare

1. A retail company wants to analyze the relationship between **advertising expenses (in thousand dollars)** and **monthly sales revenue (in thousand dollars)** to optimize their marketing budget. The following data was collected from 10 different months:

Month	Advertising Expenses (X)	Sales Revenue (Y)
1	10	25
2	15	30
3	12	28
4	18	35
5	20	40
6	25	45
7	22	42
8	30	50
9	28	48
10	35	55

- (a) Compute the coefficient of variation (CV) for both variables (advertising expenses and sales revenue). (4 marks)
- (b) Compute the correlation coefficient (r) between advertising expenses and sales revenue, and interpret its value. (4 marks)
- (c) Find the regression equation of Y on X (i.e., predict sales revenue based on advertising expenses). (4 marks)
- (d) Find the regression equation of X on Y (i.e., predict advertising expenses based on sales revenue). (4 marks)
- (e) Using the regression equation of Y on X, estimate the expected sales revenue when the company spends \$27,000 on advertising. (2 marks)

Using the regression equation of X on Y, estimate the required advertising expense if the company wants to achieve \$47,000 in sales revenue.

2. The following is the daily wages of the workers of two large factories

Daily wages (x Rs 10)	No. of workers	
	Factory X	Factory Y
75 to 100	30	50
100 to 125	60	80
125 to 150	88	120
150 to 175	120	70
175 to 200	60	40
200 to 225	25	30
225 to 250	14	10

- (a) Calculate the mean, median and standard deviation of daily wages for workers in both factories.
- (b) Compute coefficient of variation of each group and determine which factory has more consistent daily wage of workers?
- (c) Compute coefficient of skewness for each group and test for the normality of the distribution.
- (d) Find the 95 % confidence interval of mean daily wages of workers in two factories.