SREENIDHI INSTITUTE OF SCIENCE & TECHNOLOGY
(An Autonomous Institution approved by UGC and 'A' Grade Awarded by NAAC)

II Year B.Tech, Semester-II **PROBABILITY & STATISTICS**

Code: 8HC16

UNIT-VI: Curve fitting and Regression: (10L)

Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Types of Regression, linear regression, multiple regressions.

Assignment Questions

1. By the Method of least squares, find the straight line that best fits the following data:

x	1	2	3	4	5
Y	12	25	40	50	65

2. Fit a second degree parabola to the following data:

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

3. For the following data, find the equation of the best fitting exponential curve of the form $y = ae^{bx}$

x	1	3	5	7	9
y	100	81	73	54	43

4. For the following data, find the equation of the best fitting curve of the form $y = ab^x$

x	1	2	3	4	5
y	130	152.2	177.3	190.2	244.7

5. Heights of fathers and sons are given in inches:

Height of father	65	66	67	67	68	69	71	73
Height of son	67	68	64	68	72	70	69	70

Form the two lines of regression and calculate the expected average height of the son when the height of the father is 67.5 inches

6. Calculate the regression equations of Y on X from the data given below, taking deviations from actual means of X and Y:

Price(Rs)	10	12	13	12	16	15
Amount Demanded	40	38	43	45	37	43

Estimate the likely demand when the price is Rs. 20

7. The following calculations have been made for prices of 12 stocks (X) in stock exchange, on a certain day along with the volume of the sales in thousands of shares (Y). From these calculations find the regression equation of prices of stocks, on the volume of the sales of shares.

$$\sum X = 580, \sum Y = 370, \sum XY = 11499, \sum X^2 = 41658, \sum Y^2 = 17206$$

8. If $\sigma_x = \sigma_y = \sigma$ and the angle between the regression lines is $Tan^{-1}\left(\frac{4}{3}\right)$

9. Find the mean values of the variables X and Y and correlation coefficient from the following regressions equations. $5X + 3Y = 12$ and $4X + 2Y = 10$.

10. Find multiple regression of Z on X and Y

Z:	4	3	1	9	6
X:	6	8	10	11	2
Y:	2	5	7	11	6