**Assignment – XII**

**(Regression and Correlation)**

**Deadline: 12th Nov**

1. Wing lengths of 13 sparrows of various ages in given in the table below:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Age (days) X | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 12 | 14 | 15 | 16 | 17 |
| Wing Length  (cm) Y | 1.4 | 1.5 | 2.2 | 2.4 | 3.1 | 3.2 | 3.2 | 3.9 | 4.1 | 4.7 | 4.5 | 5.2 | 5.0 |

1. Obtain the regression equation of Y on X and give the Y intercept and slope of the line.
2. What would be the predicted value of Y for X = 13 days?
3. Show that the point (X\_bar, Y\_bar) always lies on the best fit regression line.
4. Compute the standard error of estimate and draw lines parallel to regression line at ± SY.X. What is the slope of these lines?
5. Compute the correlation coefficient between the age of the sparrow and its wing length.
6. The correlation coefficient for sample size 13 is computed in step-5. Can we conclude at significance levels of 0.05 that the corresponding population correlation coefficient differs from zero?
7. Find the 95% confidence limits for the correlation coefficient for sample size 13 is computed in step-5.
8. Compute the correlation coefficients samples of size N1 = 5 and N2 = 10 (from the table above, taking first 5, and first 10 as two samples). Is there a significant difference between the two coefficients at the 0.05 level?
9. Test the null hypothesis at the 0.05 significance level that the regression coefficient of the population regression equation is 0.20 versus the alternative hypothesis that the regression coefficient exceeds 0.20. Find the 95% confidence limits for the population regression coefficient.
10. Find the 95% confidence limits for the wing length of sparrows whose age is 10days.