**Assignment – XIV**

(Non-Parameteric Tests)

**Deadline: 14th Nov**

1. If X1, X2, …Xn are distributed in a Poisson fashion, show that the maximum likelihood estimate of  is given by .
2. The breaking strengths of a random sample of 25 ropes made by a manufacturer are given in table. On the basis of this sample, test at the 0.05 significance level the manufacturer’s claim that the breaking strength of a rope is (a) 25 and (b) 40.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 41 | 28 | 35 | 38 | 23 |
| 37 | 32 | 24 | 46 | 30 |
| 25 | 36 | 22 | 41 | 37 |
| 43 | 27 | 34 | 27 | 36 |
| 42 | 33 | 28 | 31 | 24 |

1. A farmer wishes to determine whether there is a difference in yields between two different varieties of wheat, I and II. Table shows the production of wheat per unit area using the two varieties. Can the farmer conclude at significance level of 0.01 that a difference exists?

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Wheat I | 15.9 | 15.3 | 16.4 | 14.9 | 15.3 | 16.0 | 14.6 | 15.3 | 14.5 | 16.6 | 16.0 |
| Wheat II | 16.4 | 16.8 | 17.1 | 16.9 | 18.0 | 15.6 | 18.1 | 17.2 | 15.4 |  |  |

1. An experiment is performed to determine the yields of five different varieties of wheat: A, B, C, D, and E. four plots of land are assigned to each variety. The yields (in bushels per acre) are shown in table. Assuming that the plots have similar fertility and that the varieties are assigned to the plots at random, determine whether there is a significant difference between the yields at the 0.05 level.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A | 20 | 12 | 15 | 19 |
| B | 17 | 14 | 12 | 15 |
| C | 23 | 16 | 18 | 14 |
| D | 15 | 17 | 20 | 12 |
| E | 21 | 14 | 17 | 18 |

5. In the table below is given the first two grades (X and Y) of 10 students on two short quizzes in biology. Find the coefficient of rank correlation.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Grade on 1st Quiz (X)** | **6** | **5** | **8** | **8** | **7** | **6** | **10** | **4** | **9** | **7** |
| **Grade on 2nd Quiz (Y)** | **8** | **7** | **7** | **10** | **5** | **8** | **10** | **6** | **8** | **6** |