NON-PARAMETRIC INFERENCE

1. A manufacturer of electric bulbs claims that he has developed a new production process which will increase the mean efficiency (in suitable units) from the present value of 9.03. The results obtained from an experiment with 15 bulbs from the new process are given as follows :

9.29	10.15	8.69
11.25	11.47	9.76
12.05	12.38	9.08
10.25	8.93	9.02
10.87	10.00	11.56

   Do we have reasons to believe that the efficiency has increased ?

2. 20 ear-head measurements of a variety of wheat are given as follows :

9.3	8.8	10.7	11.5
8.2	9.7	10.3	8.6
11.3	10.7	11.2	9.0
9.8	9.3	9.9	10.3
10.0	10.1	9.6	10.4

   Test at 5% level of significance whether the population median length of ear-head is 9.9 cm. by using Wilcoxon signed-rank test.

3. The following are the marks secured by two batches of salesmen in the final test taken after completion of training. Use an appropriate non-parametric test with $\alpha = 0.02$ for the null hypothesis that the samples are drawn from identical distributions against the alternative that the distributions differ in location only.

   Batch A : 26, 27, 31, 26, 19, 21, 20, 25, 30;

   Batch B : 23, 28, 26, 24, 22, 19.