Practice Problems

1. A company produces electric bulbs whose average life time is 180 days and average variation 10 days. It is claimed that, in a newly developed process the mean life time can be increased.

(a) Design a decision rule for the process at the 0.05 significance to test 100 bulbs.

(b) What about the decision if the average life time of a bulb (i) 184 days (ii) 187 days.

(c) If the new process has increase the mean life time to 185 days. Find α and β for the estimated mean 183 days for 80 samples.

(d) If the estimated average life time for 55 samples is 184 days, find the *p*-value of the claim of the manufacturer.

2. Design a decision rule to test the hypothesis that a die is fair if we take a sample of 150 trials of the die to get even/odd faces and use 0.01 as the significance level. Predict the acceptance and critical region.

3. Design a decision rule to test the hypothesis that a coin is fair if we take a sample of 120 trials of the die to get head/tail and use 0.1 as the significance level. Predict the acceptance and critical region.

4. A company produces an electric tool whose average life time is 260 days and variance 169 days. It is claimed that, in a newly developed process the mean life time can be increased. If the new process has increase the mean life time to 276 days, assuming a sample of 80 bulbs with estimated life time 269 days, find α and β.

5. A pharmaceutical company produces a new medicine and they claimed that it will reduce the migraine pain very fast with 85% accuracy. Design a decision rule for the process with the significance 0.01 by apply the medicine to 150 people.