



SUMMARY AND CONCLUSION

This dissertation is devoted to the study of truncated life test through acceptance sampling procedures using minimum angle method .

The first chapter describes the basic concepts of quality control, acceptance sampling and reliability. Also the review of sampling plans relevant to this thesis are given.

In chapter-2 Single sampling plan for truncated life test is considered. A new approach of designing Single sampling plans for truncated life test using minimum angle method, is proposed when the life time of the items follows Rayleigh distribution, Generalized Exponential distribution, Weibull distribution and Gamma distribution. The test termination time and mean ratio time are specified. The acceptance number is also specified. The design parameter is obtained such that it satisfies both producer's risk and consumer's risk simultaneously. The tables of design parameter are provided for easy selection of the plan parameter. The results are analysed with the help of tables and examples. One can conclude that when the Weibull distribution is followed, the sample size is very much less than the sample size of all other distribution. And at the same time producer's risk and consumer's risk also less and the sum of the risks is also very much less for Weibull distribution. Figure 2.1 shows the OC curves of all four distributions. From the figure, one can observe that probability of acceptance is more for Rayleigh distribution and Weibull distribution than any other distributions. It can be seen that by applying minimum angle method one can obtain parameters which satisfy both the conditions on the producer's risk as well as consumer's risk and at the same time the sum of risk is also minimum.

In chapter-3 Double sampling plan for truncated life test is considered. A new approach of designing Double sampling plans for truncated life test using minimum angle method, is proposed when the life time of the items follows Rayleigh distribution, Generalized Exponential distribution, Weibull distribution, Gamma

distribution and Marshall - Olkin Extended Lomax Distribution. The test termination time and mean ratio time are specified. The acceptance numbers are specified as $c_1 = 0$ and $c_2 = 2$. The design parameter is obtained such that it satisfies both producer's risk and consumer's risk simultaneously. The tables of design parameter are provided for easy selection of the plan parameter. The results are analyzed with the help of tables and examples. One can conclude that when the Weibull distribution is followed, the sample size is very much less than the sample size of all other distributions. And at the same time the producer's risk and consumer's risk is also less and the sum of the risks is also very much less for Weibull distribution. Figure 3.1 shows the OC curves of all four distributions. From the figure, one can observe that probability of acceptance is more for Weibull distribution and Gamma distribution than any other distributions. It can be seen that minimum angle method minimizes simultaneously the consumer's risk and producer's risk. This minimum angle method plan provides better discrimination of accepting good lots.

In chapter-4 Special purpose Double sampling plan of type DSP (0, 1) for truncated life test is considered. A new approach of designing special purpose Double sampling plan of type DSP (0, 1) for truncated life test using minimum angle method, is proposed when the life time of the items follows Rayleigh distribution, Generalized Exponential distribution, Weibull distribution and Gamma distribution. The test termination time and mean ratio time are specified. The design parameter is obtained such that it satisfies both producer's risk and consumer's risk simultaneously. The tables of design parameter are provided for easy selection of the plan parameter. The results are analyzed with the help of tables and examples. One can see that Weibull distribution is comparatively better than other distributions. And at the same time the producer's risk and consumer's risk also less and the sum of the risks is also very much less for Weibull distribution. Figure 4.1 shows the OC curves of all four distributions. From the figure, one can observe that probability of acceptance of Weibull distribution is more than any other distributions. It can be seen that by applying minimum angle method one can obtain parameters which minimize simultaneously the consumer's risk and producer's risk. This minimum angle method plan provides better discrimination of accepting good lots

In chapter-5 Chain sampling plan for truncated life test is considered. A new approach of designing chain sampling plans for truncated life test using minimum angle method, is proposed when the life time of the items follows Rayleigh distribution, Generalized Exponential distribution, Weibull distribution and Gamma distribution. The test termination time, mean ratio time and number of preceding sample i are specified. The design parameter is obtained such that it satisfies both producer's risk and consumer's risk simultaneously. The tables of design parameter are provided for easy selection of the plan parameter. The results are analysed with the help of tables and examples. One can say that Weibull distribution is comparatively better than other distributions. And at the same time producer's risk and consumer's risk also less and the sum of the risks is also very much less for Weibull distribution. Figure 5.1 shows the OC curves of all four distributions. From the figure, one can observe that the probability of acceptance of Rayleigh distribution is more than any other distribution. It can be seen that by applying the minimum angle method one can get the parameters which minimize simultaneously the consumer's risk and producer's risk. This minimum angle method plan provides better discrimination of accepting good lots.

In chapter-6 Group sampling plan for truncated life test is considered. A new approach of Group acceptance sampling plan for a truncated life test using minimum angle method is proposed when the life time of the test items follows Rayleigh distribution, Generalized Exponential distribution, Weibull distribution and Gamma distribution. Minimum angle method is applied to determine the design parameter group size g by satisfying both the risks at the specified quality levels simultaneously and at the same time minimizing the sum of risks. Tables of design parameters are provided. The results are explained with some examples and comparisons are made among the distributions considered. One can conclude that when the Generalized Exponential distribution is followed, the sample size is very much less than the sample size of all other distributions. And at the same time the producer's risk and consumer's risk is also less and the sum of the risks is also very much less for Generalized Exponential distribution. Figure 6.1 shows the OC curves of all four distributions. From the figure, one can observe that the probability of acceptance of

Rayleigh distribution is more than any other distributions. It can be seen that the application of the minimum angle method minimizes simultaneously the consumer's risk and producer's risk. This minimum angle method plan provides better discrimination of accepting good lots.

In chapter-7 Group sampling plan using weighted binomial distribution for truncated life test is considered. A new approach is proposed for designing Group acceptance sampling plan with weighted binomial distribution for a truncated life test when the life time of the test items follows Rayleigh distribution, Generalized Exponential distribution, Weibull distribution and Gamma distribution. Minimum angle method is applied to determine the design parameter group size g by satisfying both the risks at the specified quality levels simultaneously and at the same time minimizing the sum of risks. Tables of design parameters are provided. The results are explained with some examples and comparisons are made among the distributions considered. One can conclude that when the Generalized Exponential distribution and Weibull distribution is followed, the sample size is very much less than the sample size of all other distributions. And at the same time the producer's risk and consumer's risk is also less and the sum of the risks is also very much less for Generalized Exponential distribution and Weibull distribution. Figure 7.1 shows the OC curves of all four distributions. From the figure, one can observe that probability of acceptance of Rayleigh distribution and Gamma distribution is more than any other distributions. It can be seen that the application of the minimum angle method minimizes simultaneously the consumer's risk and producer's risk. This minimum angle method plan provides better discrimination of accepting good lots.