ABSTRACT

Acceptance sampling plans play a major role in statistical quality control analysis. It contracts with the disposition of large sized submitted lot of products on the basis of the quality features of the inspected products in a sample taken from this lot. A good acceptance sampling scheme not only increases the accuracy of the decision of submitted lot disposition but also reduces the time and energy needed for life-testing experiments and cost for conducting inspection.

In this thesis, two economic reliability group acceptance sampling plans are developed for truncated life-testing, when a tester accommodating a multiple number of products as a group and can be tested simultaneously, if the lifetime of a product is supposed to follow a Pareto distribution of second kind with the known value of the shape parameter.

The test termination ratios are calculated by considering the various levels of the producer's risks, when the values of acceptance number, group size and number of groups are pre-determined. The operating characteristics values are also computed for the various quality levels. The comparison of the designed economic reliability group acceptance sampling plans are made with the existing group acceptance sampling plans available in literature such as Aslam *et al.*(2011). It is observed that the values of the test termination ratios of the designed economic reliability group acceptance sampling plans are smaller than those of the existing group acceptance sampling plans. Therefore, we can say that the proposed economic reliability group acceptance sampling plans are preferable than the existing group acceptance sampling plan in terms of time and cost. The results are illustrated with the help of the tables, OC curves and numerical examples.

We observe that as the group size increases for fixed values of acceptance number and number of groups, the test termination ratios decreases and as the acceptance number and number of groups increases, the test termination ratios increases for fixed value of group size. It can also observed that the test termination ratios increases as the value of shape parameter increases for fixed values of acceptance number, number of groups and the group size. We can also notice that the values of the operating characteristics increases with the increase in quality level.