

ABSTRACT

The reliability of components has been very important factor in manufacturing as well as in industries. Engineering sciences are always been faced with the reliability of the machinery as well as of buildings. In this thesis the reliability study has been carried out in case of parent Rayleigh Distribution. Brief summary of the thesis is given below.

Some review of the reliability methods and models used in the literature has been given in chapter — 1 of the thesis. The analysis methods and uses of reliability models have also been discussed in the same chapter. The following chapter provides a comprehensive review of the literature.

The reliability coefficient based on the parent Rayleigh distribution has been obtained in chapter — 3 of the thesis. The maximum likelihood estimate of the resulting reliability coefficient has also been given in the same chapter along with the exact sampling distribution of the estimated reliability coefficient. The moments of the resulting distribution has also been obtained long with the mean and variance.

Empirical study has also been carried out on the expected value and variance of the reliability coefficient in chapter 3 of the thesis. It has been found that for equal sample sizes the expected reliability will be always equal to 0.5. It has also been found from the empirical study that the expected reliability will increase with increase in the value of constant “k” and for small value of θ_2 It has also been found that the variance will decrease with large value of “k” and “m”.

The asymptotic distribution of the reliability coefficient has also been obtained and is given in chapter — 4 of the thesis. It has been found that the asymptotic sampling distribution of the reliability coefficient is a Cauchy distribution.