

## ABSTRACT

In this thesis the generalization of Inverse Weibull Distribution has been obtained with the hope that it will attract wider applicability to survival analysis. The generalization is motivated by the work of Eugene et al (2002). Chapter 1 comprises the introduction of Weibull Distribution, Beta Distribution and Inverse Weibull Distribution. Relationships of Weibull Distribution and Inverse Weibull Distribution with other distributions have been brought into account. Some review of the transcendental functions has also been given in the chapter. The following chapter provides a brief Literature Review of generalized distributions.

In chapter 3 the density function of Three Parameter Beta-Inverse Weibull Distribution has been generated from the logit of beta random variable. For real and Integer values of "a" and "b" the expression of Density Function is obtained. It is found that for real "a" and "b" the density is the weighted sum of Infinite Inverse Weibull Distribution, and for Integer values of "a" and "b" the density is the weighted sum of Finite Inverse Weibull Distribution. Cumulative Distribution Function, its Shape, Hazard Function, Hazard Plots and Survivorship Function are also obtained and it is observed that proposed distribution has increasing, decreasing and unimodal hazard rates and the general form of  $k^{\text{th}}$  moment along with the first four moments, expressions for Mean, Variance, Skewness Coefficient, and Coefficient of Kurtosis have been derived. The Method of Maximum Likelihood is proposed for estimating the model parameters.

In chapter 4 the empirical study for the proposed distribution has been conducted to observe the behavior of Distribution. The values of Mean, Variance, Skewness and Kurtosis of the generalized form are obtained to

observe the effect of its three parameters on this distribution. It is observed that when the two parameters of Beta Distribution " $a$ " and " $b$ " are "1" the proposed distribution behaves similarly as Inverse Weibull Distribution. Plots of Density Function are obtained and found that it is a Unimodal Distribution and for different choices of its parameters it is becoming Symmetrical. Skewness and Kurtosis Plots are obtained and it is observed that Skewness decreases as " $b$ " increases and increases as " $a$ " increases. And the Kurtosis decreases as " $b$ " increases and increases as " $a$ " increases.