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**The Weighted Power ………………. (14 Times New Roman)**

*Rashid A. Ganaie1, V.Rajagopalan1 and M. Khalifa2*

1Department of Statistics, Faculty of Science, Annamalai University, Tamil Nadu, India

2Department of …, Applied Science University, Road 23, East Al Ekir, P.O. Box: 5055 kingdom of Bahrain

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**Abstract:** In this paper, we propose a new extension of power Shanker distribution known as weighted power Shanker distribution. The different statistical properties of the newly introduced distribution are studied and discussed such as moments, order statistics, likelihood Ratio test, Income distribution curves, and entropy and reliability measures. The maximum likelihood estimators of the parameters of new distribution are studied and also the Fisher’s information matrix is discussed. Application of the new distribution with three real life data sets are executed to show the supremacy of weighted power shanker distribution in analyzing real life time data.

**Keywords:** Weighted distribution, Power Shanker distribution, Order statistics, Maximum likelihood estimation, Reliability measures.

# 1 Introduction

Weighted distributions introduced [1] plays a vital role in technique of fitting models to the unknown weight functions when the samples can be taken both from the original distribution and the developed distribution and then [2] modified and formulated in general terms in connection with modelling statistical data when the usual practice of using existing standard distributions was found to be inappropriate. Weighted distributions are applied in many fields such as reliability, medicine and ecology [3]. Weighted distributions are modified with reference to the probabilities of events as observed and transcribed [4-12].

The concept of weighted distributions provides an access on collectively basis to deal with problems of model specification and data interpretation [11]. Weighted distributions arise when the observations generated from a stochastic process are not given equal chances of being recorded; instead they are recorded according to some weight function [14]. ……………………………………………………..

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In this paper we introduce a new distribution with three parameters, known as weighted Power Shanker (WPS) distribution. We introduce the new distribution with the hope that it will provide a better result and will be reliable and flexible in comparison with other distributions. On applying the weighted version, the third parameter in this distribution makes it more flexible to describe different types of real data than its sub-models. …………………………………

**2 Weighted Power Shanker (WPS) Distribution**

The probability density function of power Shanker (PS) distribution is given by



and the cumulative distribution function of power Shanker distribution is given by



Suppose X is a non-negative random variable with probability density function .Let be the non-negative weight function, then, the probability density function of the weighted random variable

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**3 Reliability Measures**

In this section, we obtain the reliability function, hazard rate and Reverse hazard rate functions of the Proposed weighted power Shanker distribution.

**11 Conclusions**

In the present study, a new model of power Shanker distribution is introduced named as weighted power Shanker distribution with three parameters and its different statistical and mathematical properties are investigated and studied. The subject distribution is generated …………………………

***Conflicts of Interest Statement***

*The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.*

***Ethics Statement***

*This research did not require ethical approval. Data Availability Statement Data associated with the manuscript is public and has been referenced appropriately.*

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