BAYESIAN ESTIMATION OF THE SHAPE PARAMETER OF FINITE RANGE DISTRIBUTION USING LINEX LOSS FUNCTION WITH TYPE II CENSORING

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Abstract: In this paper we have considered the Bayesian estimation under Type II for the shape parameter of the Finite Range distribution using linex loss function under quasi, natural conjugate and uniform prior distributions. These estimators are compared with the corresponding Bayes estimators under squared error loss function.

Keywords and Phrases: Squared error loss function, asymmetric loss function, prior distribution, diffuse and non informative prior, posterior pdf and expectation, inverted gamma distribution
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1. Introduction

Let us consider the Finite Range distribution with probability density function (pdf) given by

$$f(x; \sigma, \theta) \;=\; \frac{1}{\theta x}\left(\frac{x}{\sigma}\right)^{\frac{1}{\theta}}; \;\; \theta > 0, \; \sigma > 0, \; 0 < x \le \sigma, \qquad (1.1)$$

where σ is known (Mukherjee and Islam [4]). Let us suppose that n items, having the life time distribution with *pdf* as (1.1), are put to life test experiment, without replacement, and the experiment is terminated as soon as $r(\le n)$ items have failed. If $\underline{X} = (X_1, \cdots, X_r)$ denote the random vector of the r observations (life times) as obtained above. The joint pdf of $\underline{X}$ is given by

$$f(\underline{x}|\theta) \;=\; \frac{n!}{(n-r)!}\left(\frac{1}{\theta}\right)^r \left(\prod_{i=1}^{r} x_i\right) e^{-\left(\frac{T_r}{\theta}\right)}, \qquad (1.2)$$

where

$$T_r \;=\; \left[\sum_{i=1}^{r} \log\left(\frac{\sigma}{x_i}\right) + (n-r)\log\left(\frac{\sigma}{x_{(r)}}\right)\right].$$