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Abstract : The Burr type XII distribution has gained more attention from many authors especially in reliability studies. The four-parameter Burr type XII distribution: is more flexible than the two-parameter distribution since it uses new scale and location parameters. In this thesis, the four-parameter Burr type XII distribution is described and its relation to other distributions presented. One of the objectives of this study is the estimation of the four parameters, reliability and hazard rate functions, based on type I and type II censored samples, using the maximum likelihood method. The uniformly minimum variance unbiased estimates of each of the shape and location parameters and the corresponding reliability and hazard rate functions of the shape parameter are obtained, assuming that the other parameters are known. Confidence intervals for each of the location and shape parameters and their corresponding-reliability and hazard rate functions are , obtained by assuming that the other parameters are known. Finite mixtures of the four-parameter Burr type XII components are discussed and the identifiability of m components of such mixtures is established. Multivariate Burr type XII distribution is presented and two new multivariate constructions are introduced