

Answer the Following Questions

1. Find the method of moment and maximum likelihood estimates of the shape parameter of Weibull distribution

$$f(x) = x^{\alpha-1} \exp(-x^\alpha), \quad x \geq 0, \quad \alpha > 0.$$

Use 1000 random sample of sizes 10, 20 and 30 to calculate the bias and mean square errors of the obtained estimates.

2. Calculate the MLEs of θ_1 and θ_2 of the mixture of two exponential distributions based on 1000 sample of sizes 10, 50 and 100.

$$f(x) = \frac{0.4}{\theta_1} \exp\left(-\frac{x}{\theta_1}\right) + \frac{0.6}{\theta_2} \exp\left(-\frac{x}{\theta_2}\right), \quad x \geq 0, \quad \theta_1, \theta_2 > 0.$$

3. Find the modified method of moment a estimates of the shape parameters of the three-parameter Weibull distribution.
4. Calculate the single and product moments of order statistics from the standard normal distribution when $n = 10$.
5. Calculate the coefficients of the BLUE in example 4.2.1, page 75 [in Balakrishnan and Cohen, 1991].