



Question Bank: (Estimation Theory)

Q_1 / In a r.s.s.n from Poisson distn $Poi(\theta)$, find the m.l.e for θ .

Q_2 / In a r.s.s.n from exponential distⁿ $Exp(1/\theta)$, find the m.l.e for:

$$1) u_1(\theta) = \frac{1}{\theta} \quad 2) u_2(\theta) = \frac{\ln(\theta)}{\theta}$$

Q_3 / Let X_1, X_2, \dots, X_n be a r.s.s.n from normal distⁿ $N(\theta, 1)$, find the m.l.e for θ .

Q_4 / In a r.s.s.n from Geometric distⁿ $Geo(\theta)$, with p.d.f ; $f(x;\theta) = \theta(1 - \theta)^{x-1}$, $x = 1, 2, \dots$, find the m.l.e for θ :

Q_5 / In a r.s.s.n from Geometric distⁿ $Geo(\theta)$, with p.d.f ; $f(x;\theta) = \theta(1 - \theta)^x$, $x = 0, 1, 2, \dots$, find the m.l.e for θ :

Q_6 / Let X_1, X_2, \dots, X_n be a r.s.s.n from normal distⁿ $N(\theta, \sigma^2)$, **1)** find m.l.e for parameters θ and σ^2 . **2)** If S^2 is m.l.e. for σ^2 , then find m.l.e. for σ .

Q_7 / In a r.s.s.n taken from a distⁿ with p.d.f ; $f(x;\theta) = e^{-(x-\theta)}$, $\theta \leq x < \infty$, find the m.l.e for θ .

Q_8 / Let X_1, X_2, \dots, X_n be a r.s.s.n from normal distⁿ $N(\theta, \sigma^2)$, estimate the parameters θ and σ^2 using moment method.

Q_9 / Estimate the parameter by using moment method for $Ber(\theta)$.

Q_{10} / Estimate the parameter by using moment method for $Geo(\theta)$.

Q_{11} / In a rsn, find m.v.e. for the parameter of $\text{Ber}(\theta)$.

Q_{12} / In a rsn, find m.v.e. for the parameters of $N(\theta, \sigma^2)$.

Q_{13} / Find Bayes estimator for parameters of $N(\theta, \sigma^2)$, using non informative prior probability.

Q_{14} / Find Bayes estimator for parameter of $\text{Exp}(1/\theta)$, using non informative prior probability.

Q_{15} / Find Bayes estimator for parameter of $\text{Ber}(\theta)$, using non informative prior probability.

Q_{16} / Find Bayes estimator for parameter of $\text{Ber}(\theta)$, using non informative prior probability.

Q_{17} / Find Bayes estimator for parameter of $\text{Poisson}(\theta)$, using non informative prior probability.

Q_{18} / Estimate the parameters of $N(\theta, \sigma^2)$ (θ known) and (σ^2 known), using Bayesian informative prior probability.

Q_{19} / Find Bayes estimator for parameter of $\text{Poisson}(\theta)$, using Bayesian informative prior probability.

Q_{20} / Estimate the parameter of $\text{Exp}(\theta)$, using Bayesian informative prior probability.

Q_{21} / Let X_1, X_2, \dots, X_{20} be a random sample from normal population with unknown mean, and unknown variance, we found that ($\bar{X} = 76.1, S^2 = 88.36$), find 99% CI for σ^2 .

Q_{22} / An epidemiologist studied the blood glucose level of a random sample of 100 patients. The mean was 170, with a SD of 10. Find (95%) confidence interval for θ .

Q_{23} / A rsn(50) taken from normal population with mean (θ) and variance σ^2 , and ($\bar{X} = 5.67, S = 1.94$). Find (95%) confidence interval (CI) for θ .