6.1)

$$l(x,\lambda) = -n\lambda + ln\lambda^{\sum x_i} - ln\prod x_i!$$

$$I(\lambda) = E(rac{\sum x_i}{\lambda^2}) = n/\lambda$$

$$\therefore \pi(\lambda) = \sqrt{\frac{n}{\lambda}}$$

6.2)

$$f(x, heta)= heta^x(1- heta)^{n-x}$$

$$l(\theta) = xln\theta + (n-x)ln(1-\theta)$$

$$I(heta) = E(x/ heta^2 - (n-x)/(1- heta)^2) = rac{n}{2}(rac{1}{ heta^2} - rac{1}{(1- heta)^2})$$

$$\therefore \pi(heta) = \sqrt{rac{n}{2}(rac{1}{ heta^2} - rac{1}{(1- heta)^2})}$$

6.3)

$$l(\alpha, \lambda) = -nln\Gamma(\alpha) - n\alpha ln\lambda + (\alpha - 1)\sum x_i - \sum x_i/\lambda$$

$$I(\lambda) = E(2\sum x_i/\lambda^3 - nlpha/\lambda^2) = 2lpha/\lambda^4 - nlpha/\lambda^2$$

$$\therefore \pi(\lambda) = \sqrt{2\alpha - n\alpha\lambda^2}/\lambda^2$$

21)

平方损失下, Bayes估计即为后验期望

$$\pi(heta|x) = rac{(n+1)^{\sum x_i+1}}{\Gamma(\sum x_i+1)} heta^{\sum x_i} e^{-(n+1)\lambda}$$

$$\hat{ heta}_B(x) = (\sum x_i + 1)/(n+1)$$

24)

$$\because \hat{\tau}_B = \frac{E(\tau w(\tau)|x)}{E(w(\tau)|x)}$$

$$w(au) = 1/ au^2$$

$$\therefore \hat{ au}_B = rac{E(1/ au|x)}{E(1/ au^2|x)}$$

$$\because E(1/\tau|x) = \beta/\alpha, E(1/\tau^2|x) = (\beta^2 + \beta)/\alpha^2$$

$$\therefore \hat{ au}_B = lpha/(eta+1)$$