$$\frac{\partial^2 \ln L}{\partial \lambda^2} = x \cdot \frac{1}{\lambda^2}$$

$$M\left(\frac{\partial^2 \ln L}{\partial \lambda^2}\right) = M(x) \cdot \frac{1}{\lambda^2} = \lambda \cdot \frac{1}{\lambda^2} = \frac{1}{\lambda}$$

$$3_1(\lambda) = \frac{1}{\lambda}$$

$$3_n(\lambda) = \frac{n}{\lambda}$$

$$e(\lambda) = \frac{1}{\frac{n}{\lambda} \cdot \frac{\lambda}{n}} = 1 \Rightarrow \text{estimator eficient}$$

d)

$H_0: \lambda = \lambda_0 = 1$

$H_1: \lambda = \lambda_1 = 2$

$$p(x, \lambda) = \begin{cases} \frac{\lambda^x}{x!} \cdot e^{-\lambda} & x \in N \\ 0 & \text{in rest} \end{cases}$$

selectia de volum 1 $\quad n = 1$

$x_1 \dots x_n \quad x_1 = Y$

$$L(\lambda) = \prod_{i=1}^{n} f(x_i, \lambda)$$

$$= f(X, \lambda)$$

$$f(\lambda_0) = L(1) = \frac{1}{x!} \cdot \frac{1}{e}$$

$$L(\lambda_1) = L(2) = \frac{2^x}{x!} \cdot \frac{1}{e^2}$$

$$\frac{L(\lambda_1)}{L(\lambda_0)} = \frac{\frac{2^x}{x!} \cdot \frac{1}{e^2}}{\frac{1}{x!} \cdot \frac{1}{e}} = \frac{2^x}{e^2 \cancel{x!}} \cdot \cancel{x!}\, e = 2^x e^{-1} \geq k_\alpha$$