№ 6

$n = 200$

I раз - 181 ; II раза 9

$H_0: \xi \sim B(2, p)$, $H_1: \bar{H}_0$

$$A = n \sum_{i=0}^{2} \frac{(\nu_i - p_i)^2}{p_i} \sim \chi^2(2)$$

$$\nu_1 = \frac{181}{200} \quad \nu_2 = \frac{9}{200} \quad \nu_0 = \frac{10}{200}$$

H_0: $p_0 = C_2^0 p^0 (1-p)^2 = (1-p)^2$

$p_1 = C_2^1 p^1 (1-p) = 2p(1-p)$

$p_2 = C_2^2 p^2 (1-p)^0 = p^2$

$$\tilde{A} = 200\left(\frac{\frac{10}{200} - (1-p)^2}{(1-p)^2}\right)^2 + 200\left(\frac{\frac{181}{200} - 2(1-p)p}{2(1-p)p}\right)^2 + 200\left(\frac{\frac{9}{200} - p^2}{p^2}\right)^2$$

$$\ln L = 10 \ln(1-p) + 181 \ln p + 181 \ln(1-p) + 181 \ln 2 + 19 \ln p \to \max$$

$$\frac{\partial \ln L}{\partial p} = -\frac{201}{1-p} + \frac{199}{p} = 0 \to 201p = 199 - 199p \Rightarrow \boxed{p_{max} = \frac{199}{400}}$$

$$\frac{\partial^2 \ln L}{\partial p^2} = \frac{201}{(1-p)^2} + \frac{199}{p^2} \Rightarrow \{p_{max}\} = \frac{201 \cdot 400^2}{201^2} - \frac{199}{199^2} 400^2 < 0$$

$$\tilde{\Delta} = \frac{200 \cdot 400^2}{201^2}\left(\frac{10}{200} - \left(\frac{201}{400}\right)^2\right)^2 + \frac{200\,400^2}{2 \cdot 201 \cdot 199}\left(\frac{181}{200} - 2\frac{201 \cdot 199}{400^2}\right)^2 +$$

$$+ \frac{200 \cdot 400^2}{199^2}\left(\frac{9}{200} - \frac{199^2}{400^2}\right)^2 \approx 132{,}09$$

$$p\text{-value} = \int_{132{,}09}^{\infty} q_4(t)\,dt = 2{,}12 \cdot 10^{-29} \quad 2\alpha \; L = 0{,}01 \Rightarrow \text{Отвергаем } H_0$$

Т7

$n = 100$

I. "$S<$": 25 "$S=$": 50 "$S>$": 25