Шевченко Валерий , Вариант 19

Лабораторная 7

1) $X \sim N(a, d)$; $n = 400$; $\bar{X}_n = 15$; $d = 16$; $\gamma = 0,95$

$\hat{\Theta}_n = \hat{a}_n = \bar{X}_n$, $\gamma = 0,95 \Rightarrow t_\gamma = 1,96$, $I(\hat{\Theta}_n) = I(\hat{a}_n) = \frac{1}{d} = \frac{1}{16}$

$I = \left(\hat{\Theta}_n - \dfrac{t_\gamma}{\sqrt{n \cdot I(\hat{\Theta}_n)}} \; ; \; \hat{\Theta}_n + \dfrac{t_\gamma}{\sqrt{n \cdot I(\hat{\Theta}_n)}} \right)$

$I = \left(15 - \dfrac{1,96}{\sqrt{400 \cdot \frac{1}{16}}} \; ; \; 15 + \dfrac{1,96}{\sqrt{400 \cdot \frac{1}{16}}} \right) = \boxed{(14,608 \; ; \; 15,392)}$

2) $H_0 : a = a_0 = 17 = \Theta$

$H_1 : a > a_0$

$\alpha = 0,1 \Rightarrow \gamma = 1 - \alpha = 0,9 \Rightarrow t_\gamma = 1,29$

$I(\Theta_0) = I(a_0) = \dfrac{1}{d} = \dfrac{1}{16}$ #

$Z_n = \sqrt{n \cdot I(\Theta_0)} \, (\hat{\Theta}_0 - \Theta) = \sqrt{400 \cdot \frac{1}{16}} \, (15 - 17) = -39,997$

$\Psi_{n,\alpha}(x_1 \dots x_n) = \begin{cases} H_1, \; \text{при } Z_n \geq t_\gamma \\ H_0, \; \text{при } Z_n < t_\gamma \end{cases}$

$-39,997 < 1,29 \Rightarrow \boxed{\Psi_{n\alpha}(x_1, \dots x_n) = H_0}$