$$P(|x_{min} - \theta| \geq \varepsilon) = P(x_{min} \leq \theta - \varepsilon) = \Phi(\theta - \varepsilon) =$$
$$= 1 - (1 - F(\theta - \varepsilon))^n = 1 - \left(1 - \frac{\theta - \varepsilon}{\theta}\right)^n =$$
$$= 1 - \left(\frac{\varepsilon}{\theta}\right)^n \xrightarrow[n \to \infty]{} 1$$

$$\exists \varepsilon > 0, \exists \theta > 0 : \quad P(|x_{min} - \theta| \geq \varepsilon) \xrightarrow[n \to \infty]{} 0$$

$$\Rightarrow \boxed{\tilde{\theta}_2 \text{ не явл. состолт.}}$$

B) $\tilde{\theta}_3 = x_{max}$

$$M\tilde{\theta}_3 = M x_{max}$$

$$x_{max} \sim \underbrace{(F(x))^n}_{\Psi(x)}$$

$$\psi(x) = \Psi'(x) = n\left(\frac{x}{\theta}\right)^{n-1} \frac{1}{\theta} \, \{(0, \theta)\}$$

$$M x_{max} = \int_0^\theta x \, n\left(\frac{x}{\theta}\right)^{n-1} \frac{1}{\theta} \, dx = \frac{n}{\theta^n} \frac{\theta^{n+1}}{n+1} = \frac{n}{n+1}\theta$$
$$\Rightarrow \text{смещ.}$$

$$\Rightarrow \tilde{\theta}_3^{'} = \frac{n+1}{n} x_{max}$$

$$M\tilde{\theta}_3^{'} = \frac{n+1}{n} M x_{max} = \theta \Rightarrow \boxed{\tilde{\theta}_3^{'} - \text{несмещ.}}$$

$$D\tilde{\theta}_3^{'} = \left(\frac{n+1}{n}\right)^2 D x_{max} = \frac{\theta^2}{n(n+2)} \xrightarrow[n \to \infty]{} 0$$

$$M x_{max}^2 = \int_0^\theta x^2 n\left(\frac{x}{\theta}\right)^{n-1} \frac{1}{\theta} \, dx = \frac{n}{\theta^n} \frac{\theta^{n+2}}{n+2} = \frac{\theta^2 n}{n+2}$$

$$D x_{max} = \theta^2\left(\frac{n}{n+2} - \frac{n^2}{(n+1)^2}\right) = \theta^2\left(\frac{n(n+1)^2 - n^2(n+2)}{(n+2)(n+1)^2}\right)$$

$$= \boxed{\frac{n\theta^2}{(n+2)(n+1)^2}} \xrightarrow[n \to \infty]{} 0 \Rightarrow \text{выпол. достаточ.}$$
$$\text{условие}$$

$$\Rightarrow \boxed{\tilde{\theta}_3 - \text{состолт.}}$$

$$\boxed{\tilde{\theta}_3^{'} - \text{состолт}}$$