Q. In a company of 100000 employees, HR wants to purchase t-shirts for each one. So a sample of 500 employees is taken in which 300 employees require XL size t-shirt and rest of the employees require L size t-shirt. So how many T-shirts does HR need to order in what size? Consider any confidence interval.

Ans. Given,

Population standard deviation (σ)= 100000

Sample size (n) = 500

Consider,

Sample mean $(\bar{x})$ = 50000

Parameter = Point Estimate $\pm$ Margin of Error

$$= \bar{x} \pm Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$$

α = Significance Value

= 1-C.I.

= 1-0.95

=0.05

$= Z_{\frac{\alpha}{2}} = Z_{0.025} = 1.96$

$$Parameter = \bar{x} \pm Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$$

H.F. = $50000 + 1.96 * \frac{100000}{\sqrt{500}}$

= 58765.65

L.F. = $50000 - 1.96 * \frac{100000}{\sqrt{500}}$

= 41234.35

X-Large (XL) T-shirts = 58765.65

Large T-shirts = 41234.35