Q) In the Quant test of CAT exam, the population S.D is known to be 100. A sample of 25 test takers has a mean of 520. Construct a 80% of C.I about mean?

Ans:- Given:- $\sigma = 100,\ n = 25,\ \bar{x} = 520,$

$\alpha = 1 - C.I$

$\alpha = 1 - 0.8$

$\boxed{\alpha = 0.2}$

Lower ~~frequency~~ fence

$= \bar{x} - Z_{\alpha/2}\left(\frac{\sigma}{\sqrt{n}}\right)$

$= 520 - Z_{\frac{0.2}{2}}\left(\frac{100}{\sqrt{25}}\right) = 520 - Z_{0.1}(20)$

$= 520 - 1.29(20)$ ($\because$ Z-table)

$\boxed{L.F = 494.2}$

Higher fence

$= \bar{x} + Z_{\alpha/2}\left(\frac{\sigma}{\sqrt{n}}\right)$

$= 520 + Z_{\frac{0.2}{2}}\left(\frac{100}{\sqrt{25}}\right) = 520 + Z_{0.1}(20)$

$= 520 + (1.29)(20)$

($\because$ Z-table)

$\boxed{RF = 545.8}$