In a quant test of the CAT Exam, the population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean.

Solution:-

σ = 100, n = 25, $\overline{x}$ = 520, CI = 80%

α = 1 – 0.8 = 0.2

0.2 will be divided between both the parts i.e. 0.1 for the left part and 0.1 for the right part.

Area for the rest of the part = 1 – 0.1 = 0.9

After checking in Z-score table, value of $Z_{0.9}$ = 1.29

Formula for Lower Fence:-

$$\overline{x} - Z_{\frac{a}{2}} * \frac{\sigma}{\sqrt{n}}$$

Formula for Higher Fence:-

$$\overline{x} + Z_{\frac{a}{2}} * \frac{\sigma}{\sqrt{n}}$$

Putting the respective values in the equation and after calculation, we get:-

Lower Fence = 494.2

Higher Fence = 545.8