Q1) In the Quant test of CAT exam, the population std. deviation is known to be 100. A sample of 25 test takers has a mean of 520. construct a 95% CI about the mean.

Sol) $\sigma = 100$; $n = 25$;

$\bar{x} = 520$; CI = 80%.

$\alpha = 1 - CI = 1 - 0.8 = \underline{0.2}$

$Z_{\alpha/2} = Z_{\frac{0.2}{2}} = Z_{0.1} = \underline{1.29}$

Lower fence $= \bar{x} - Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$.

$= 520 - 1.29 \times \frac{100}{\sqrt{25}}$

$= 520 - 1.29 \times 20$.

L.F $= \underline{494.2}$

Higher fence $= \bar{x} + Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$.

$= 520 + 1.29 \times 20$.

HF $= \underline{545.8}$.