

$\Rightarrow$  Assignment -

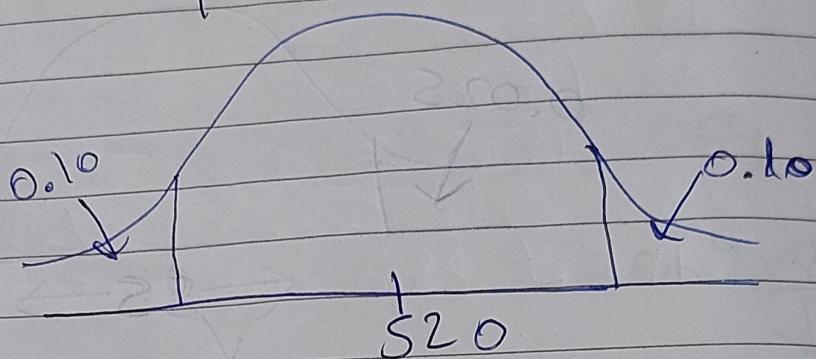
(Q) In the Quant test of C.I.T exam, the population std. dev. is known to be 100. A sample of 25 test takers has a mean of 520. Construct a 80% C.I. about mean  $\bar{x}$ .

(Ans)

$$\sigma = 100, n = 25, \bar{x} = 520$$

$\alpha = \text{Significance value}$

$$1 - C.I. \Rightarrow 0.20$$



$\Rightarrow$  Point Estimate  $\pm$  Margin Error

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

$$Z_{0.20} \Rightarrow Z_{0.10}$$

$$\Rightarrow 1 - 0.10$$

$$\Rightarrow 0.90$$

0.90 from Z-table  $\Rightarrow 1.29$

Lower fence

$$\Rightarrow \bar{x} - Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

Higher fence

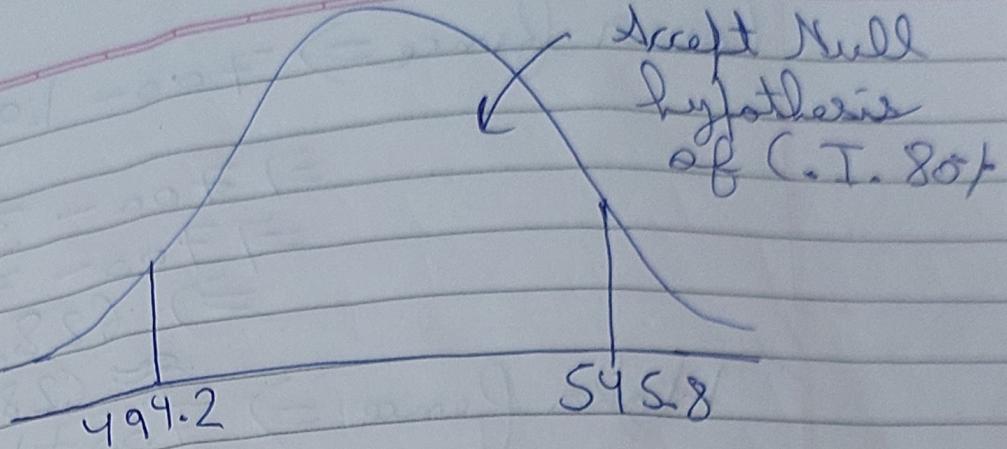
$$\Rightarrow \bar{x} + Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

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

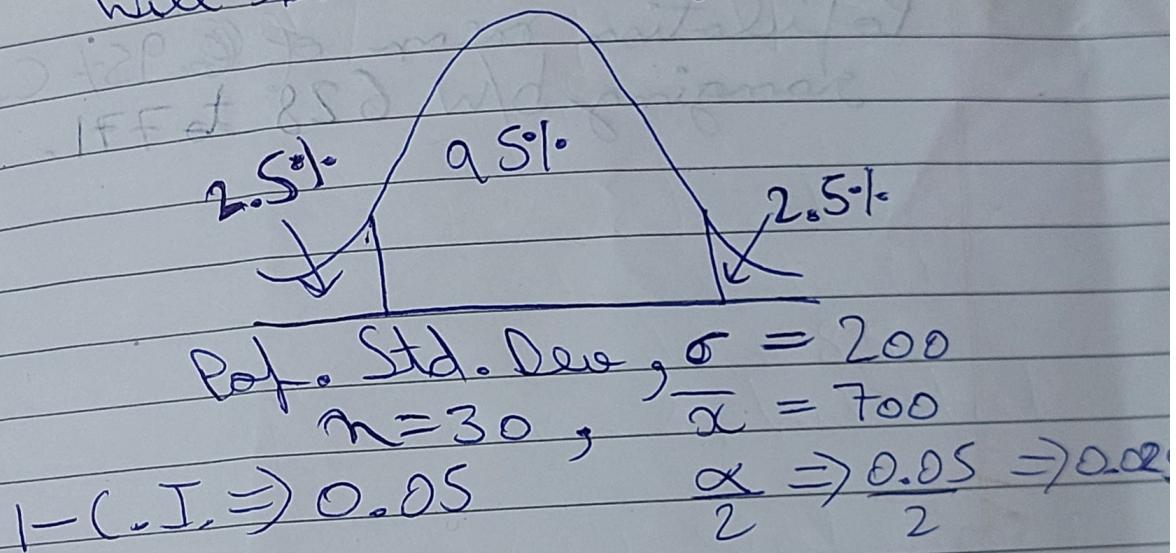
$$\Rightarrow 520 + 1.29 \times \frac{100}{\sqrt{25}}$$

$$\Rightarrow 520 - 1.29 \times 20 \\ \Rightarrow 494.2$$

$$\Rightarrow 520 + 1.29 \times 20 \\ \Rightarrow 545.8$$



- Q) What is the average size of the shark in the world? (Can take any assumptions)  
 Ans) I will be doing it with confidence interval about mean with given population Std. Dev. Will take 95% Confidence Interval



$$\Rightarrow \text{Point Estimate} \pm \text{Margin of Error}$$

$$\Rightarrow \bar{x} \pm z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$\Rightarrow 700 \pm 1.96 \times \frac{200}{\sqrt{30}}$$

$$1.96 \Rightarrow 1 - 0.025 \\ \Rightarrow 0.975$$

Find value in Z-table ~~0.975~~  $\Rightarrow 1.96$

$$\Rightarrow 700 \pm 1.96 \times \frac{200}{\sqrt{30}}$$

$$\text{Lower fence} \Rightarrow 700 - 1.96 \times \frac{200}{\sqrt{30}}$$

$$\Rightarrow 700 - 36.51 \times 1.96$$

$$\Rightarrow 700 - 71.55$$

$$\Rightarrow 628.45$$

$$\approx 628$$

$$\text{Higher fence} \Rightarrow 700 + \frac{1.96 \times 200}{\sqrt{30}}$$

$$\Rightarrow 700 + 1.96 \times 1.96$$

$$\Rightarrow 700 + 36.51 \times 1.96$$

$$\Rightarrow 700 + 71.55$$

$$\Rightarrow 771.55$$

$$\approx 771$$

Population mean of 95% C.I.  
ranging b/w 628 to 771.