Assignment 3: Dt: 03/07/022

PAGE:
DATE: / /

Qu.1:- In the Quant dest of CAT exam, the population standard deviation is known to be 100. A sample of 25 test taker has a mean of 520. Construct a 80% confidence interval about mean.

Solution:- Given,

Population S.D = 100 = σ , n = 25

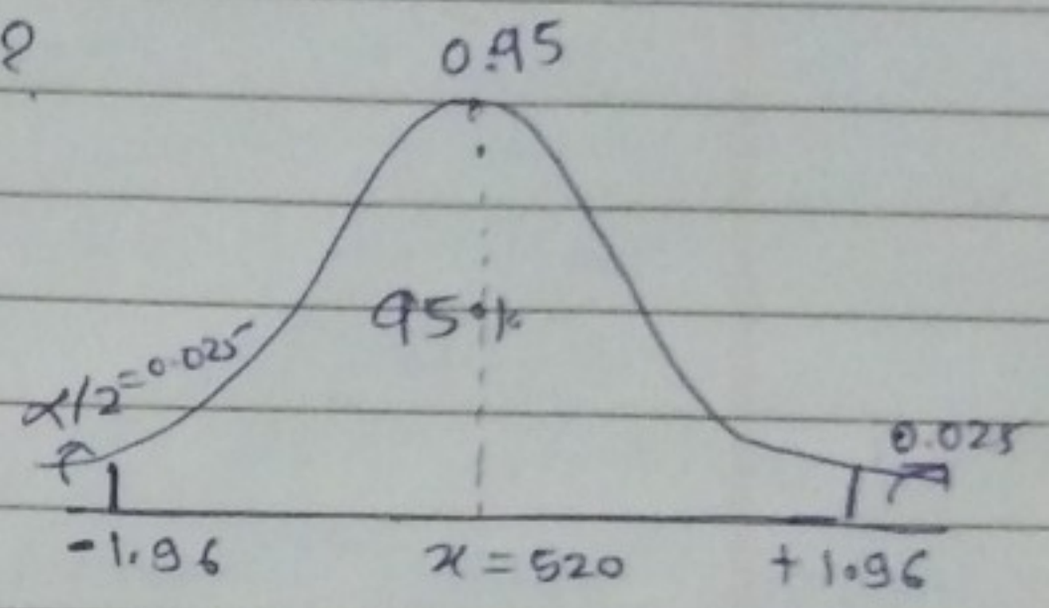
$\bar{x}$ = 520

∴ Construct 80% C.I @ mean = ?

∴ Confidence Interval :-

Point estimate ± margin of error

i.e $\bar{x} \pm Z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}}$



∴ α = 1 - C.I = 1 - 0.95 = 0.05

∴ Margin of error = $Z_{\alpha/2} = Z_{0.05/2} = Z_{0.025}$

∴ From Z table, $Z_{0.025}$

+ve, $Z_{\alpha/2}$ = 1 - 0.025 = 0.9750 = +1.96

-ve $Z_{0.025}$ = - 1.96.

⇒ Confidence Interval is

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

= 520 - 1.96 ($100/\sqrt{25}$)

= 480.8

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

= 520 + 1.96 . 20

= 559.2