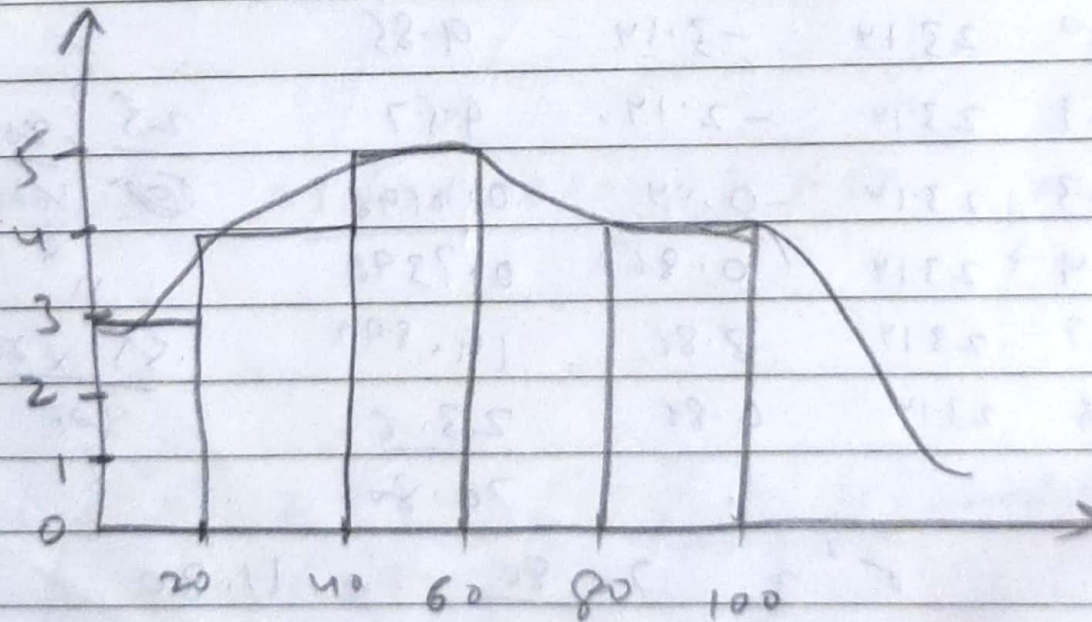


Q1.

10, 13, 18, 22, 27, 32, 38, 40, 49, 51, 56
57, 88, 90, 94, 99

Bin = 5

Bin size = 20



Assignment

Q.2 In the Quant test of CAT exam, the Population standard deviation is known to be 100. A sample of 25 test takers has a mean of 520. Construct a 80% C.I. about the mean?

Solⁿ

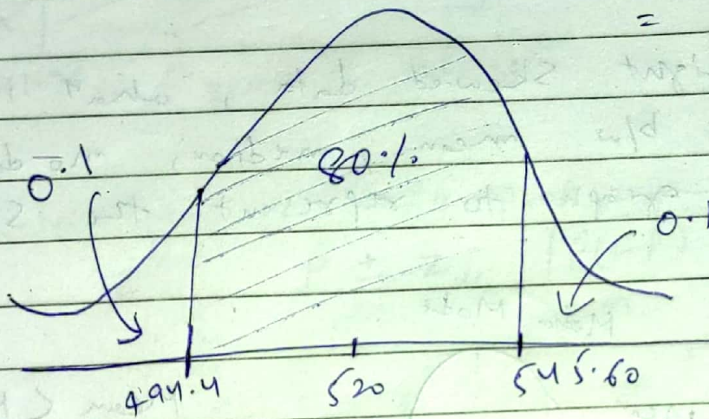
$$\sigma = 100, n = 25, \bar{x} = 520$$

$$C.I = 80\%$$

$$\text{Significance value } (\alpha) = 1 - C.I$$

$$= 1 - 80\%$$

$$= 0.2$$



$$\begin{aligned} \text{Lower fence} &= \text{Point estimate} - \text{Margin of error} \\ &= 520 - Z_{\alpha/2} \frac{\sigma}{\sqrt{n}} = 520 - 20.1 \times \frac{100}{\sqrt{25}} \\ &= 520 - 1.285 \times \frac{100}{5} = 494.40 \end{aligned}$$

$$\begin{aligned} \text{Higher fence} &= 520 + 20.1 \frac{\sigma}{\sqrt{n}} \\ &= 520 + 25.60 \\ &= 545.60 \end{aligned}$$

Q.3 A Car Company believes that the Percentage of residents in City ABC that owns a vehicle is 60% or less. A Sales manager disagrees with this. He conducts a hypothesis testing surveying 250 residents and found that 170 responded yes to owning a vehicle.

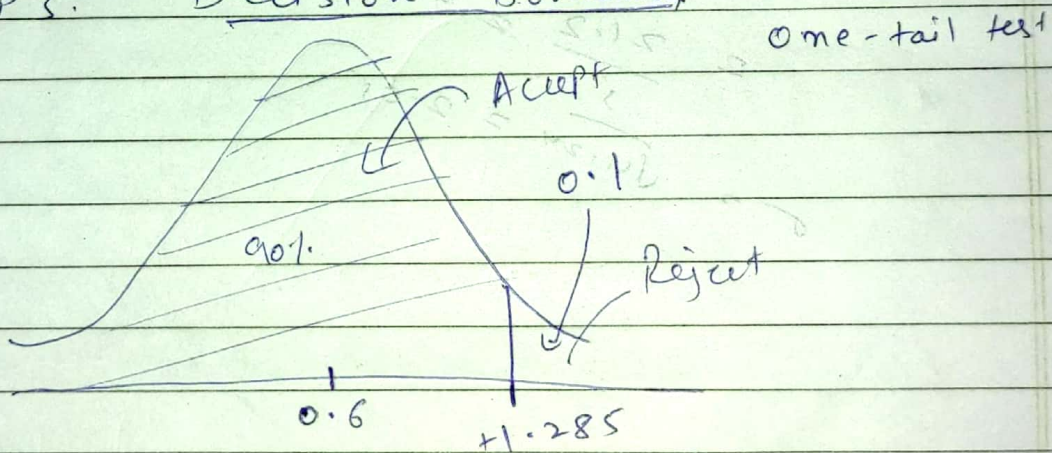
(a) State the Null & Alternate Hypothesis

(b) At 10% significance level, is there enough evidence to support the idea that vehicle ownership in City ABC is 60% or less.

Solⁿ STEP 1. $H_0 : P_0 \leq 60\%$ (Null Hypothesis)
 $H_1 : P_0 > 60\%$ (Alternate " ")
 $p_0 = 0.6$, $\hat{p} = \frac{n}{n} = \frac{170}{250} = 0.68$

STEP 2. $\alpha = 0.1$

STEP 3. Decision Boundary



STEP 4. Calculate z-test statistic

$$z = \frac{\hat{p} - P_0}{\sqrt{\frac{P_0(1-P_0)}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}} = 2.5$$

STEP 5. Conclusion

AS $z = 2.5 > 1.28$

Reject the Null Hypothesis

b) No, A 10% level, idea is not enough to support

Q.4. What is the value of the 99 Percentile?
 2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12

Solⁿ

$$\text{Value at 99 Percentile} = \frac{\text{Percentile} \times (n+1)}{100}$$

$$= \frac{99}{100} \times (20+1)$$

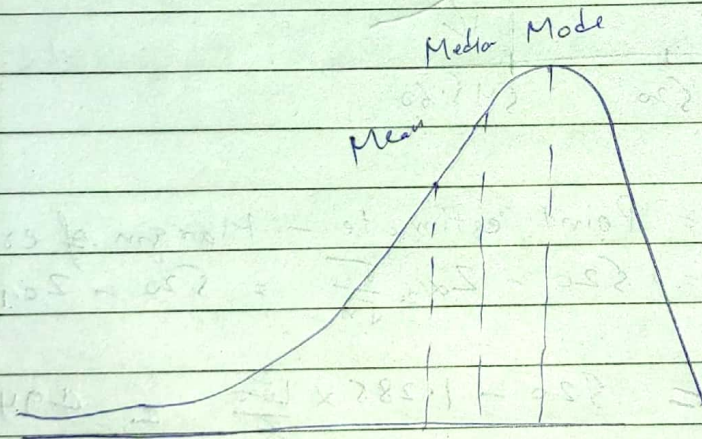
$$= 0.99 \times 21$$

$$= 20.79 \text{ Index (12)}$$

Value at 99 Percentile is 12

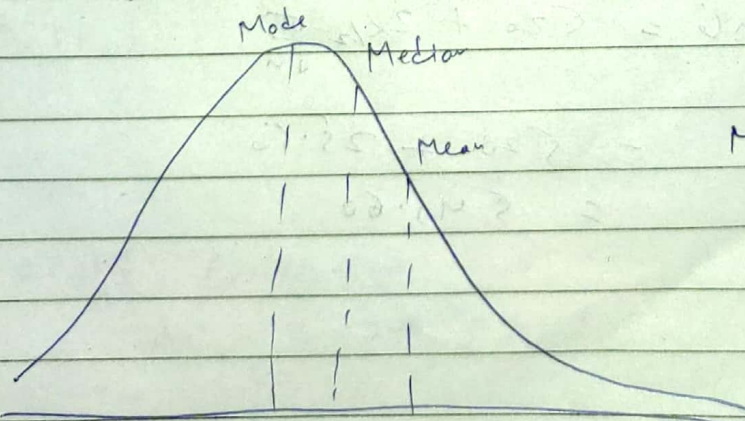
Q.5. In left & Right skewed data, what is the relationship b/w mean, median, mode?
 Draw the graph to represent the same

Solⁿ



Left skewed Data

$$\text{Mean} < \text{Median} < \text{Mode}$$



Right skewed Data

$$\text{Mode} < \text{Median} < \text{Mean}$$