Ans1.

Y-axis labels (frequency): 5, 4, 3, 2, 1
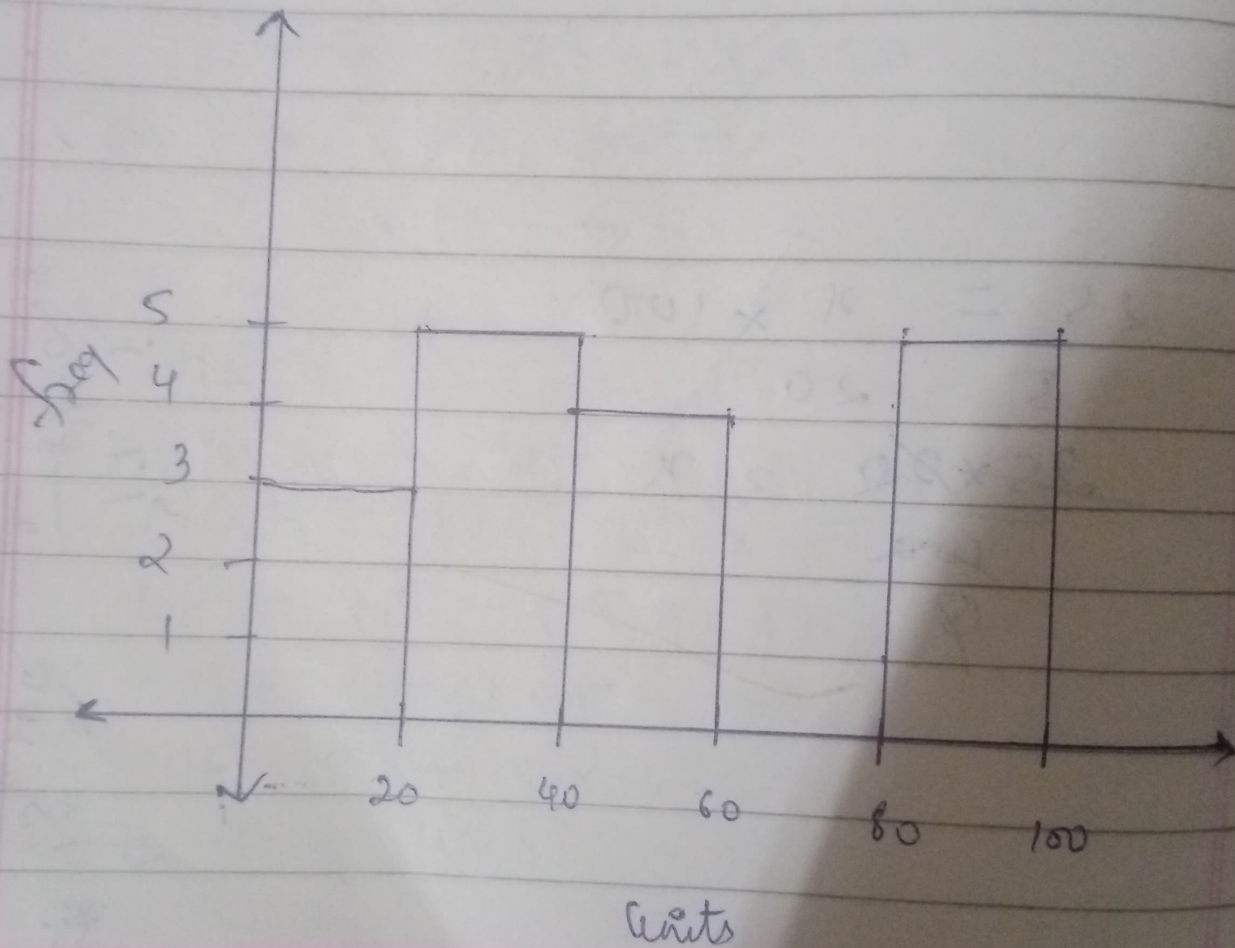
X-axis labels (Units): 20, 40, 60, 80, 100

Q2. In a Quant test of CAT Exam, the population SD is known to be 100, A sample of 25 test takers has mean 520, construct 80% CI about mean.
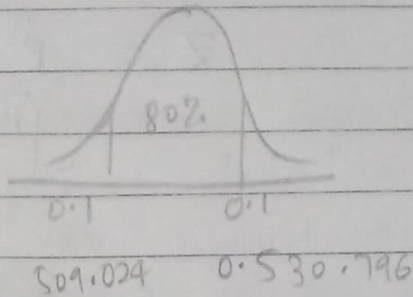
$\bar{x} = 520$

$\sigma = 100$

$CI = 80\%$

$\therefore \alpha = 0.2$

$n = 25$

80%

0.1   0.1

509.024   0.530.796

$CI = \text{point Estimate} \pm \text{Margin Error}$

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

$$= 520 \pm Z_{0.2/2} \frac{100}{\sqrt{25}}$$

$$= 520 \pm Z_{0.1} \times 20$$

$$= 520 \pm 0.5398 \times 20$$

520 + 10.796   520 - 10.796

= 530.796   = 509.024

$\therefore$ confidence Interval values are

530.796 (Higher fence) & 509.024 (LF)

Q3. A car believes that the percentage of citizens in a city ABC that owns a vehicle is 60% or less. A Sales manager disagrees if He conducted a hypothesis testing surveying 250 residents & found that 170 residents responded yes.

ⓐ State Null & alternate hypothesis.
ⓑ At a 10% Significance level is there enough evidence to support the idea that vehicle owner in ABC city is 60% or less.

$$H_0 = 60\% \text{ of } \underset{or less}{owner} \text{ owns the vehicle in city ABC i.e. } y \le 60\%$$

$$H_1 = \text{More than } 60\% \text{ owners own the vehicle in city ABC. } y > 60\%$$
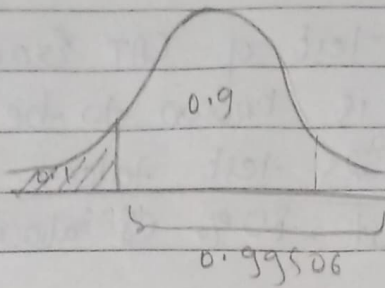
$n = 250$ $P_0 = 0.6$

$x = 170$ $\alpha = 0.091$

$$\therefore \hat{P} = \frac{x}{n} = \frac{170}{250} = 0.68$$

$$q_0 = 1 - P_0 = 1 - 0.6 = 0.4$$

0.9

0.1

0.99506

$$Z = \frac{\hat{P} - P_0}{\sqrt{\dfrac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.6}{\sqrt{\dfrac{0.6 \times 0.4}{250}}}$$

$$= \frac{0.08}{\sqrt{0.00096}} = \frac{0.08}{0.031}$$

$$= 2.581$$

for z value 2.581 the corresponding value is 0.99506

$\therefore$ P value = $1 - 0.99506$

$\qquad = 0.00494$

as $0.00494 < 0.10$

$\therefore$ Null hypothesis is rejected

Q4. Value of 99 percentile?

$a = \{2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12.\}$
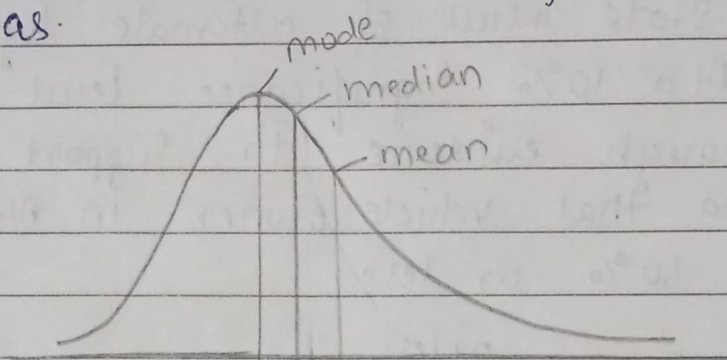
$$99\% = \frac{99}{100} \times (20+1)$$

$$= \frac{99}{100} \times 21 = 20.79$$

$\therefore$ 99% is at index position 20.79 i.e.

12//

$\therefore$ 99% = 12.

Q.5. In left & right skewed data, what is relationship between mean, median & mode? Draw the graph representing the same.
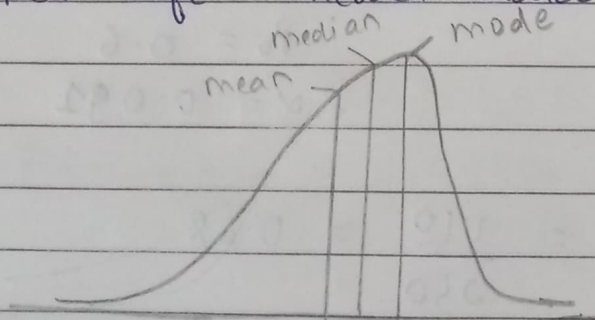
→ For right skewed data or positively skewed Data the graph is given as.

mode
median
mean

In a right skewed Data.

Mean > Median > Mode.

For left skewed data

median mode
mean

for -ve skewed data

Mode > Median > Mean