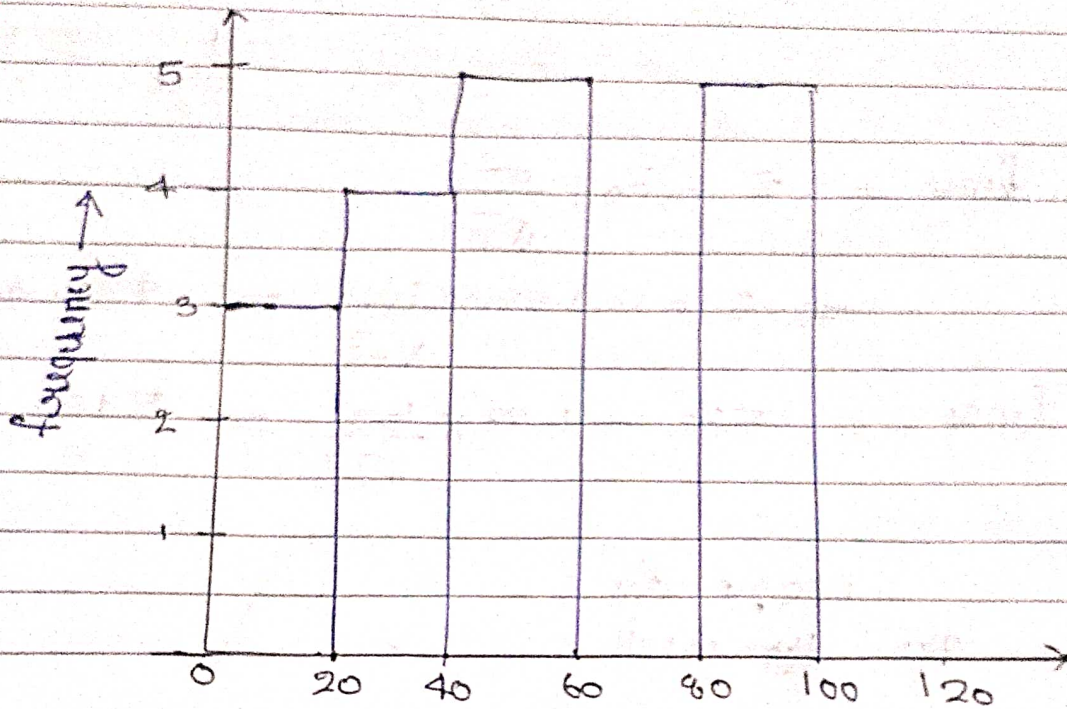Que-1- Plot a histogram,
10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57,
88, 90, 92, 94, 99

Solution-   bins = 5
              bin size = 20

Q-2- In a quant test of the CAT Exam, the population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean.
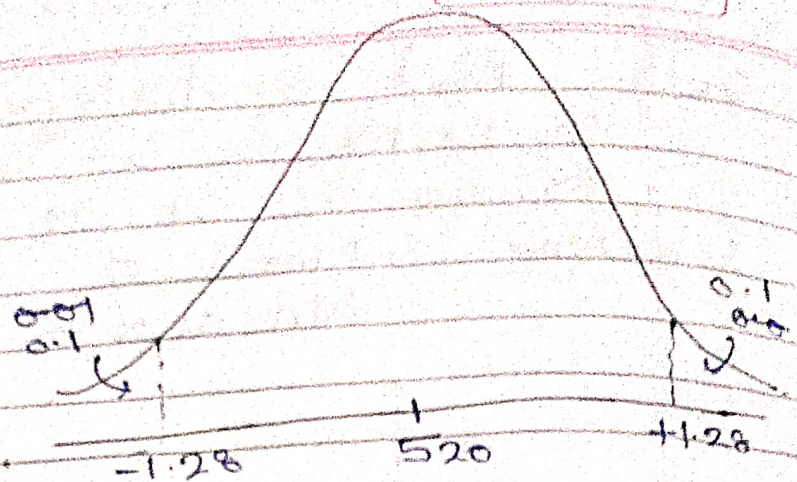
Soln- $\sigma = 100$ $n = 25$ $\bar{x} = 520$

C.I = 80%.   significance value $= \alpha = 1 - $ C.I

                          $= 1 - 0.80 = 0.20$

point estimate $\pm$ margin of error

$$\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$
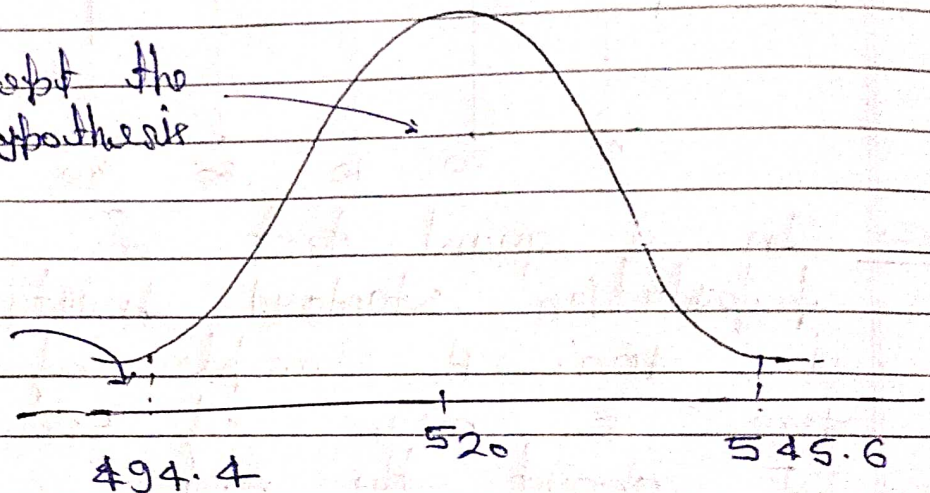
z- score table

$$Z_{\alpha/2} = Z_{0.1} = -1.28$$

lower fence $= \bar{x} - Z_{0.1} \dfrac{\sigma}{\sqrt{n}}$

$$= 520 - 1.28 \times \dfrac{100}{\sqrt{25}} = 494.4$$

Higher fence $= 520 + 1.28 \times \dfrac{100}{\sqrt{25}} = 545.6$

Accept the null Hypothesis

reject the null Hypothesis

494.4   520   545.6

-3 ⇒ A car believes that the percentage of citizens in city ABC that owns a vehicle is 60% or less. A sales manager disagrees with this. He conducting a hypothesis surveying 250 residents & found that 170 residents responded yes to owning a vehicle.

a⇒ State the null and alternate hypothesis.
b) At a 10% significance level, is there enough evidence to support the idea that vehicle owner in ABC city is 60% or less.

Soln-

1⇒ null Hypothesis : H_0 : $P_0 \leq 60\%$.
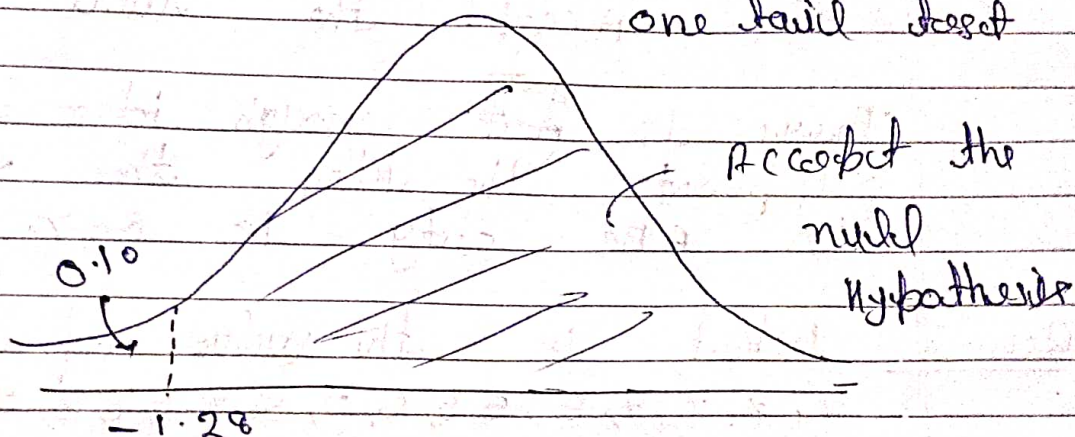alternate hypothesis ; H_1 : $P_0 > 60\%$.

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

$$n = 250, \quad x = 170$$

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

2⇒ $\alpha = 0.10$

3⇒

one tail test

Accept the null Hypothesis
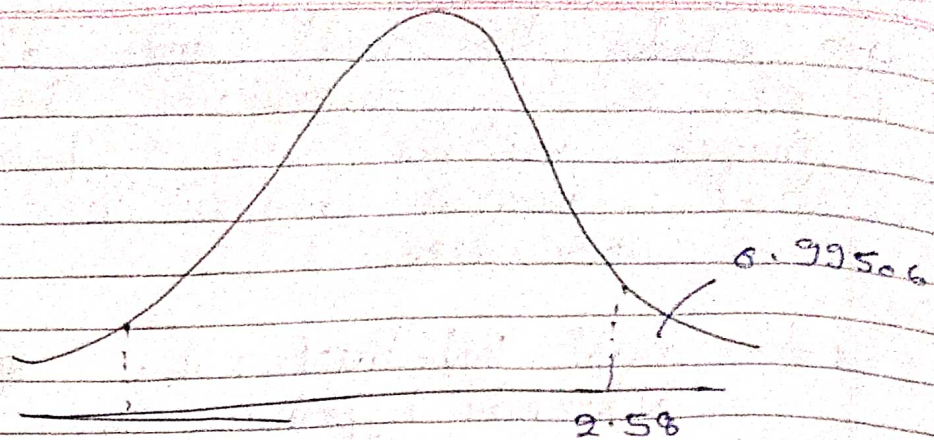
0.10

-1.28

Z - test with proportion

$$Z \text{ test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

$$= 2.58$$

P - value = 0.99506

accept the null

0.99506

2.58

P value = 0.9950
Significance value = 0.10

P - value > α
0.9950 > 0.1

Conclusion- Accept the null hypothesis

There is not enough idea evidence to support the idea that vehicle owner in ABC city is 60% or less.

Qcase-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-
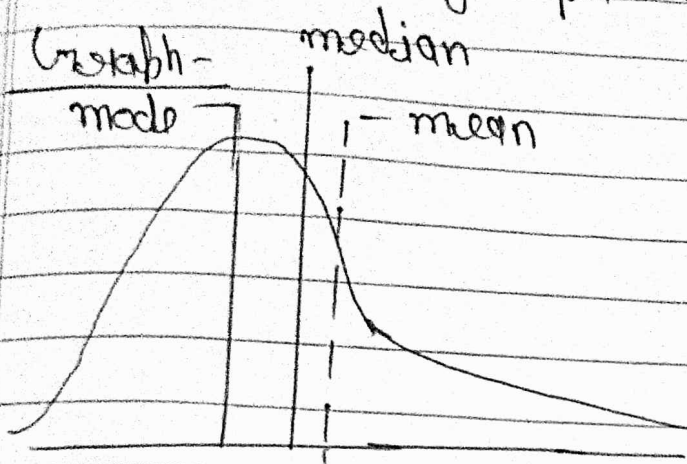
$$n = 20$$

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

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

Value of 99 percentile $= \frac{11+12}{2} = 11.5$

Any

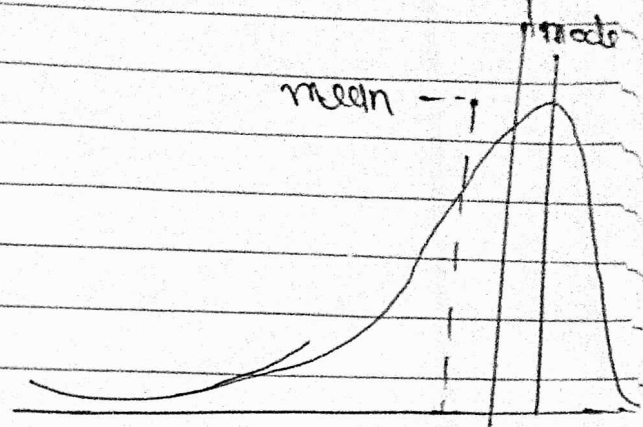Ans −5 ⇒ In left and right -skewed data, what is the relationship betʰ mean, median and mode?

Draw the graph to represent the same.

Graph −

mode
median
mean

mean
median
mode

Right - skewed

left - skewed

mean > median > mode

mean < median < mode