

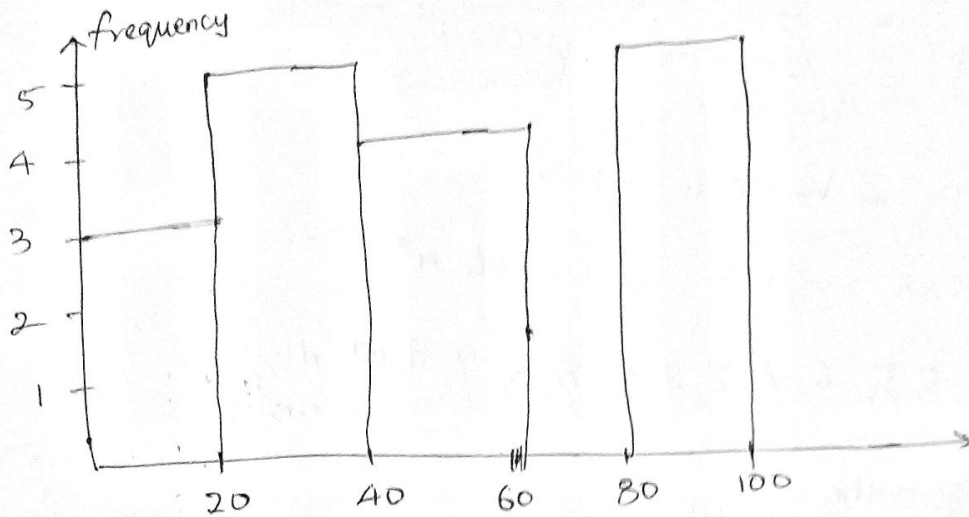
## ① Plot histogram.

1. Sort data in ascending order.

10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99

Bins = 5

Bin size = 20



## ② Quant Test.

$$\sigma = 100$$

$$n = 25$$

$$\bar{x} = 520$$

$$CI = 80\% \Rightarrow \alpha = 0.2$$

$$\alpha/2 = 0.1$$

Lower fence.

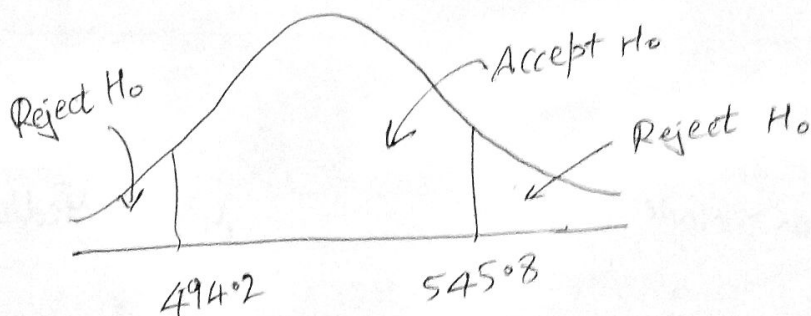
$$\bar{x} - Z_{\alpha/2} \times \frac{\sigma}{\sqrt{n}}$$

$$520 - 1.29 \times \frac{100}{\sqrt{25}} = 545.8$$

Higher fence

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

$$520 + 1.29 \times \frac{100}{\sqrt{25}} = 494.2$$



③  $P_0 = 0.6$   $n = 250$   $\hat{P} = \frac{x}{n} = \frac{170}{250} = 0.68$   
 $q_0 = 0.4$   $x = 170$

$H^0 \Rightarrow P^*$  is 60% or less.

$H^1 \Rightarrow P^*$  is not equal to 60% or less

$$Z = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08}{0.0309} = 2.588$$

At  $\alpha = 0.1$ , Z value is  $-1.28$ .

$2.588 > -1.28 \Rightarrow \text{Accept } H^0$

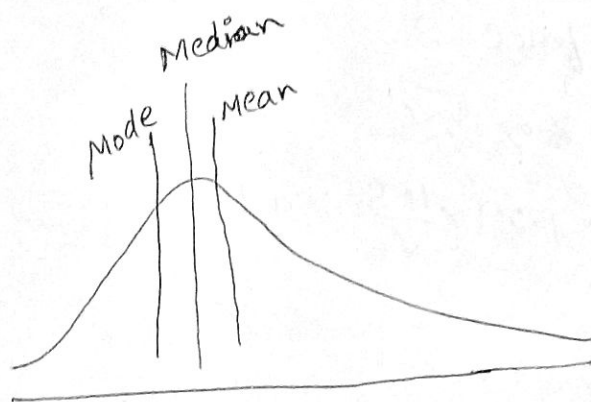
④ 2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12

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

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

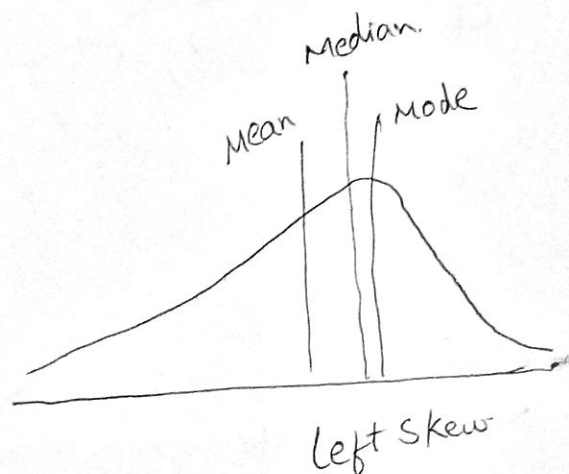
Element at this index is 12

⑤



Right skew

Mean > Median > Mode



Left skew

Mode > Median > Mean