

Assignment

Name of Practical

Q.1)

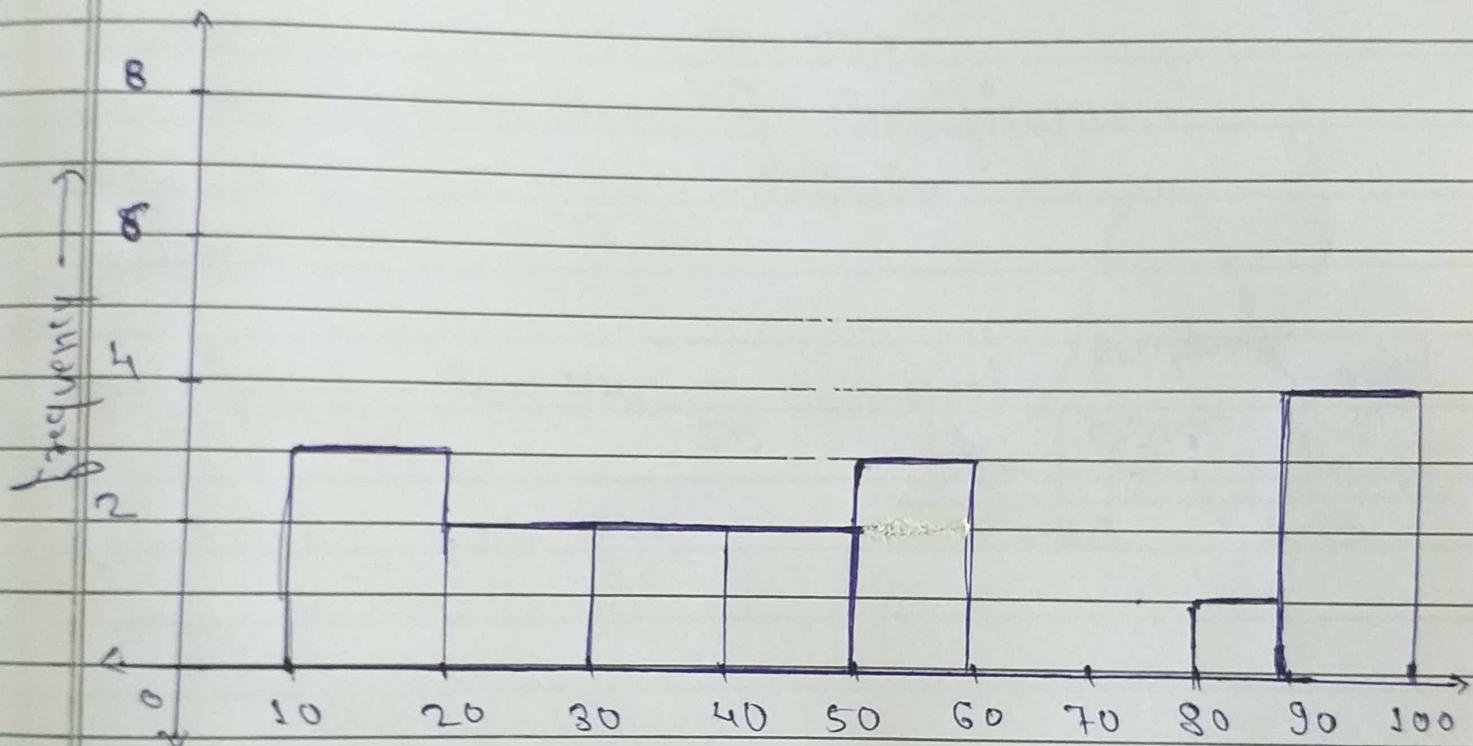
plot a histogram

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

Ans:

[0-100]

Bins = 10



of Practical

Q.2) In a quality 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 a 80% C.I. about the mean.

Ans:

Here,

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

and $\alpha = 0.20$ = level of significance

$$\text{Now, } Z_{\frac{\alpha}{2}} = Z_{0.20} = Z_{0.10}$$

$$\text{Lower fence} = \bar{x} - Z_{0.10} \frac{\sigma}{\sqrt{n}}$$

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

$$= 520 - 25.8$$

$$= 494.2$$

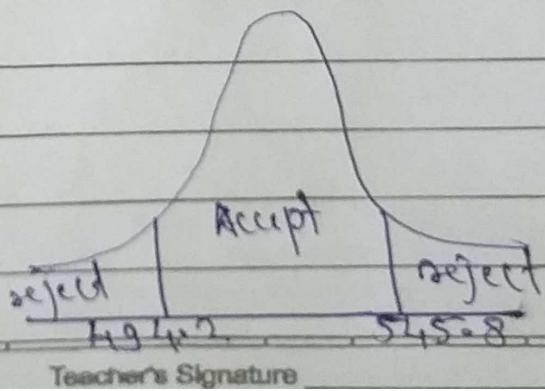
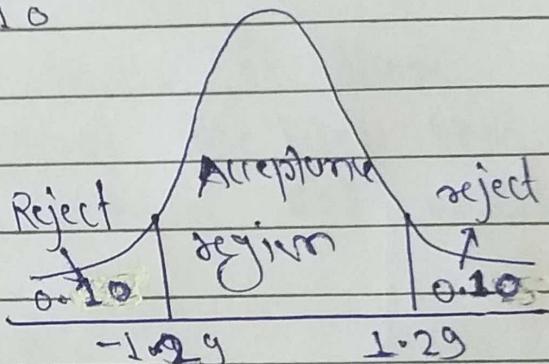
$$\text{Higher fence} = \bar{x} + Z_{0.10} \frac{\sigma}{\sqrt{n}}$$

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

$$= 520 + 25.8$$

$$= 545.8$$

$$\text{C.I.} = [494.2 - 545.8]$$



Teacher's Signature _____

Practical

Q.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 conducted a hypothesis testing surveying 250 residents and found that 170 residents responded yes to owning a vehicle.

a) State null hypothesis and alternative 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.

Ans:

$$H_0: p_0 \leq 60\% \quad \text{vs} \quad H_1: p_0 > 60\%$$

$$\text{Here } n = 250$$

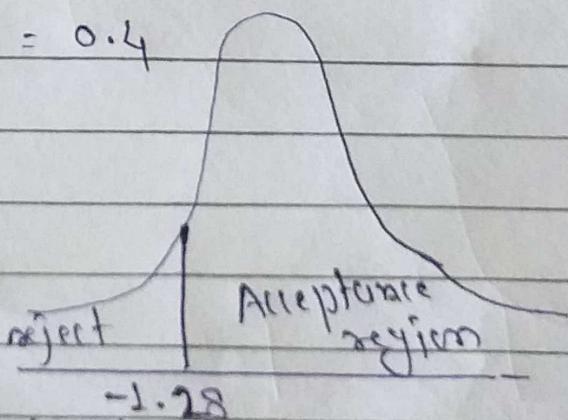
$$x = 170$$

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

$$\text{and } q_0 = 1 - p_0 = 1 - 0.6 = 0.4$$

$$\alpha = 0.1$$

$$\sigma = 90\%$$



Teacher's Signature _____

z -test with proportion

$$z_{\text{test}} = \frac{p - p_0}{\sqrt{\frac{p_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.60}{\sqrt{\frac{(0.6)(0.4)}{250}}}$$

$$= \frac{0.08}{\sqrt{\frac{0.24}{250}}}$$

$$z_{\text{test}} = \frac{0.08}{0.03098} = 2.5823$$

Conclusion:

Here z value is greater than -1.28

Hence we accept the null hypothesis. And conclude that the vehicle owner in ABC city is 60% or less.

of Practical

(Q.4) What is the value of 99 percentile?

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

Here $n = 20$

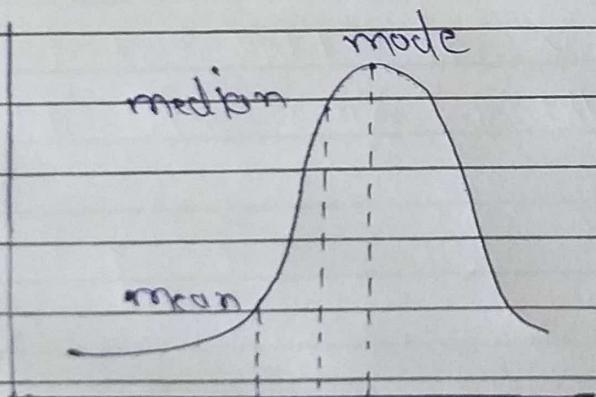
$$\text{Value} = \frac{99}{(20+1)} \times 100$$

= 20.79th value

∴ Value of 99 percentile is 12.

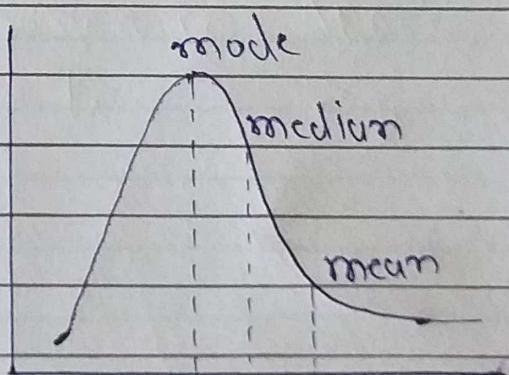
(Q.5) In left & right skewed data, what is the relationship between mean, median & mode?

Draw the graph to represent the same.



left skewed

$$\text{mean} < \text{median} < \text{mode}$$



right skewed.

$$\text{mean} > \text{median} > \text{mode}$$