

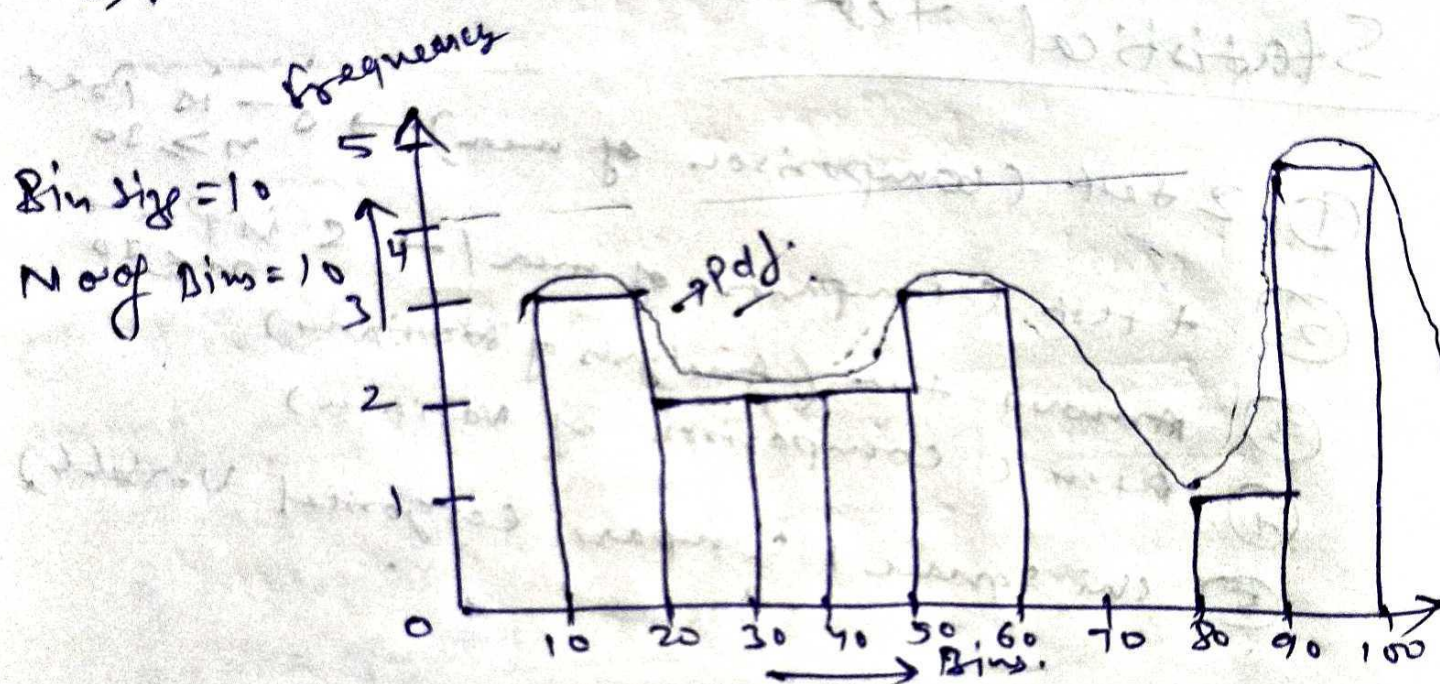
25-09-2022

Statistics Assignment i-neuron

Q1. Plot a Histogram,

10, 12, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57,
88, 90, 92, 94, 99.

Ans).



Histogram

Q2. 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 80% CI about the mean.

Ans/

Given:

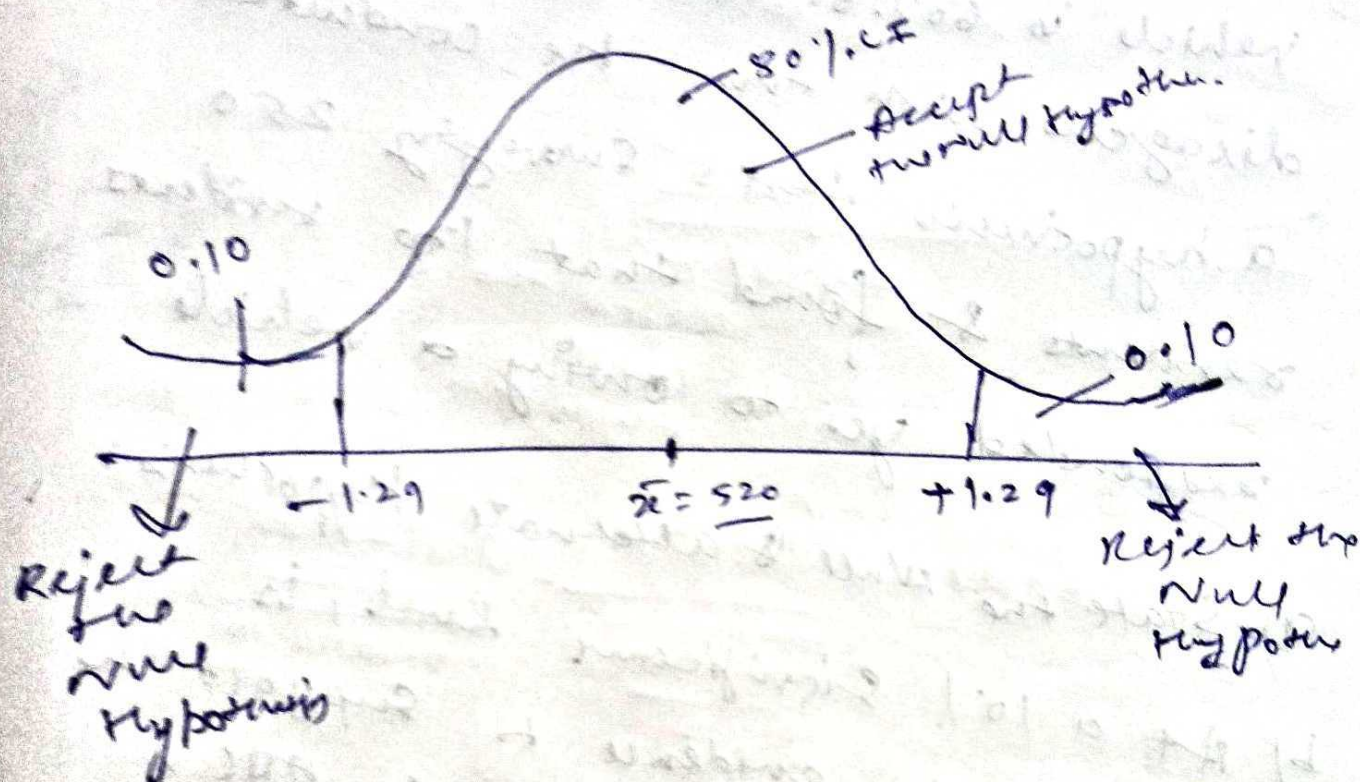
$$\sigma = 100$$

$$n = 25$$

$$\bar{x} = 520$$

$$CI = 80\%$$

$$\alpha = 1 - 0.8 = 0.2$$



Here, we know Population standard deviation we apply z test.

For, z-score is ranging between -1.29 to $+1.29$, we accept the true mean value.

Q3. 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 test surveying 250 residents & found that 170 residents responded yes to owning a vehicle.

- a) State the Null & alternate hypothesis.
- b) At a 10% significance level, is there enough evidence to support the idea that vehicle owners in ABC is 60% or less.

Ans. ①

$$\begin{array}{lcl}
 \text{Null hypothesis.} & & \\
 H_0 = p \leq 60\% & - & \\
 H_1 = p > 60\% & &
 \end{array}
 \left. \vphantom{\begin{array}{l} H_0 \\ H_1 \end{array}} \right\} \begin{array}{l} \text{one} \\ \text{tail} \\ \text{test.} \end{array}$$

②

$$n = 250$$

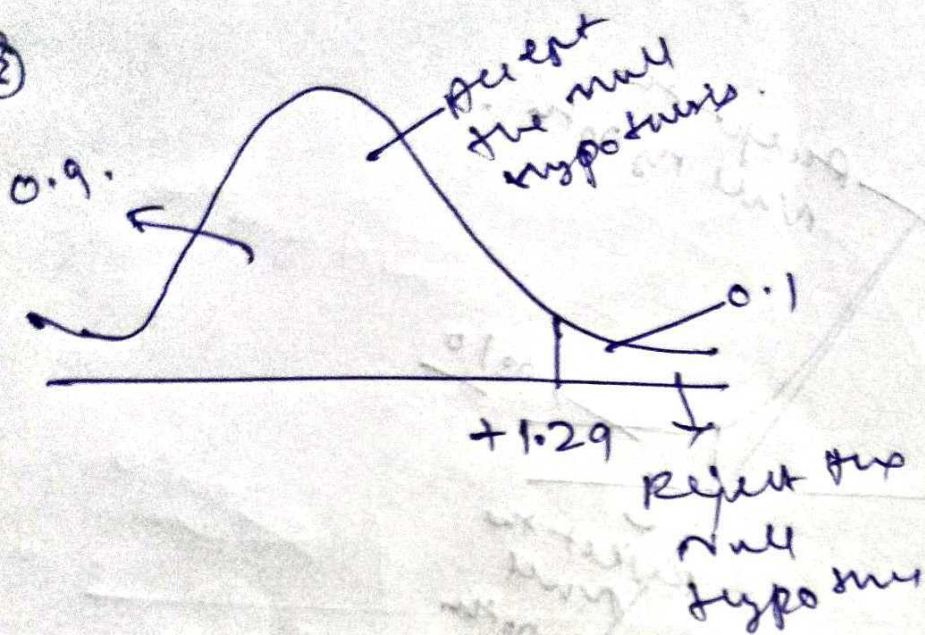
$$x = 170$$

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

$$q_0 = 1 - p_0 = 0.40$$

② $\alpha = 0.10$

②



$$Z_{\text{stat}} = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.40}{250}}}$$

$$= \frac{0.08}{\sqrt{\frac{24}{250 \times 100}}} = \frac{0.08}{0.03} = 2.66$$

Conclusion

④

$Z_{\text{stat}} > +1.29$

Hence, Reject the null hypothesis.

Q4. What is value of the 99 percentile?

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

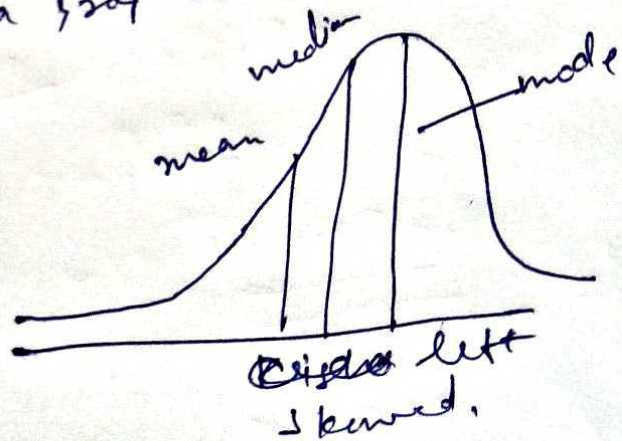
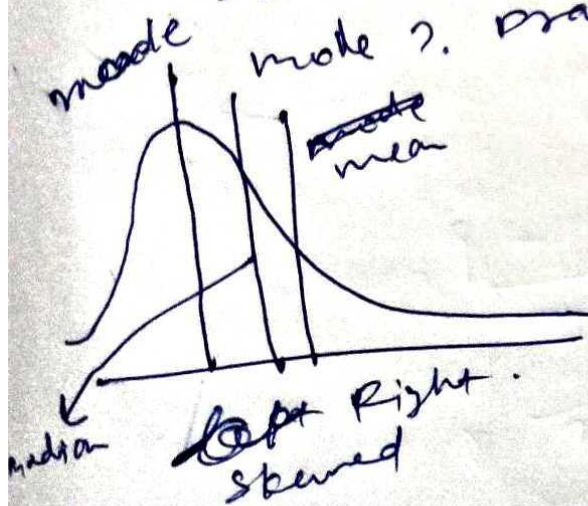
$$\text{Value} = \frac{\text{Percentile} \times (n+1)}{100}$$

$$= \frac{99}{100} \times (19+1) = \frac{99}{100} \times 20 = 19.8$$

$$= 19.8$$

$$\text{Value} = 12$$

Q5. In left & right-skewed data, what is relationship b/w mean & median & mode? Draw a graph.



Right skewed - $\text{mode} > \text{Median} > \text{mean}$
 Left skewed - $\text{mode} < \text{Median} < \text{mean}$