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Assignment

Que-1 Plot a ~~Diagram~~ histogram

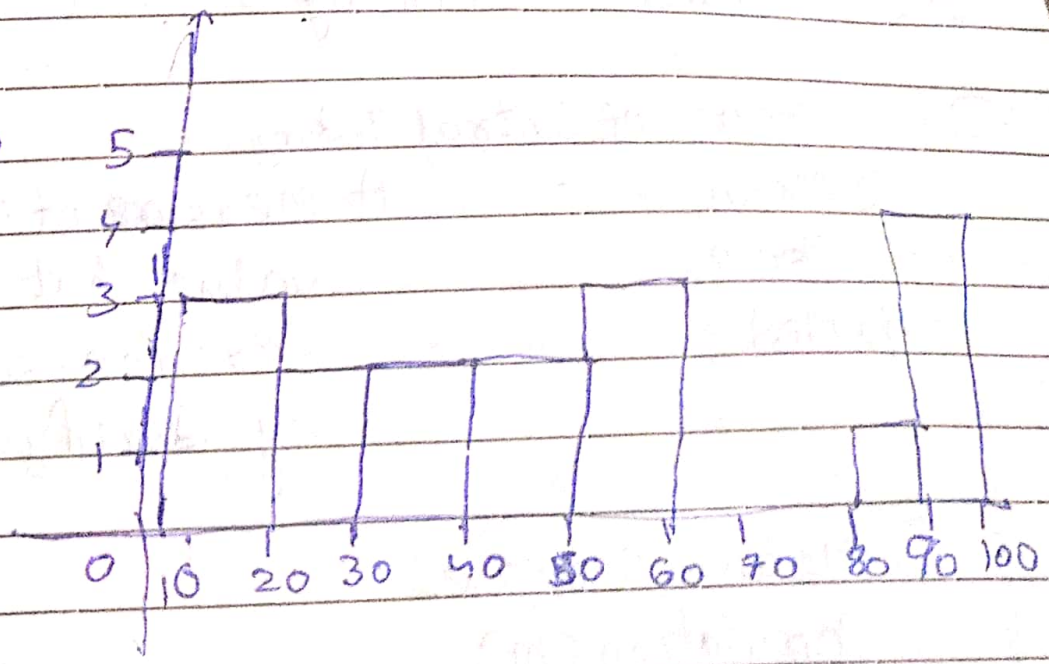
Que-1 Plot a histogram

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

Bins = 10

Bins size = $\frac{100}{10}$

= 10



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Que 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

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

Point Estimate ± Margin of error

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

CI = 80%

$\alpha = 1 - C.I$

$= 1 - 0.80$

$= 0.20$

$\frac{Z_2}{2} \Rightarrow \frac{0.20}{2} = 0.1$

$Z_{0.10}$

$1 - 0.20 = 0.8$

Zscore of 0.8

⇒ 0.78814

Lower Fence

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

$= 520 - 0.78814 \times \frac{100}{\sqrt{25}}$

$= 520 - 0.78814 \times \frac{100}{25}$

$= 520 - 0.78814 \times 20$

$= 504.2372$

Higher Fence

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

$= 520 + 0.78814 \times \frac{100}{\sqrt{25}}$

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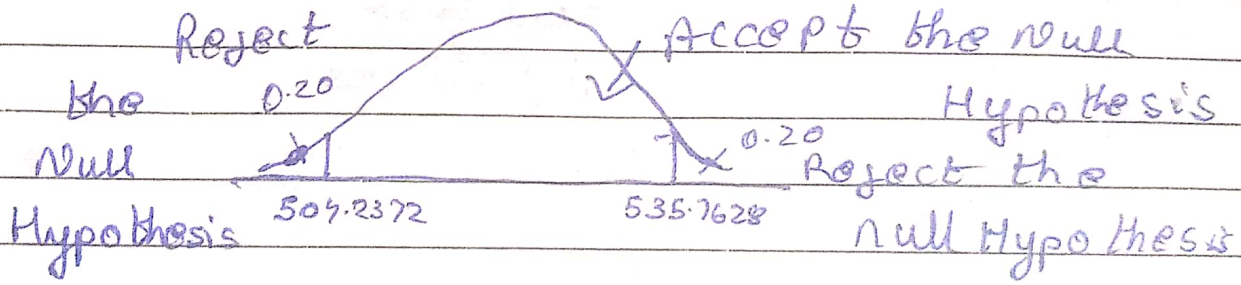
$= 520 + 0.78814 \times 20$

$= 535.7628$



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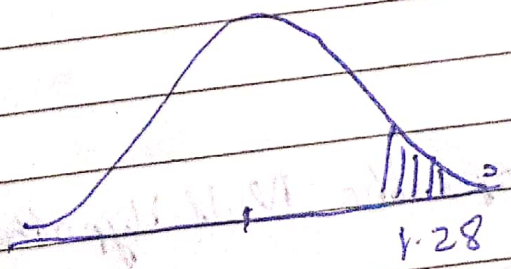
Ques 3: A car believes that the percentage of citizen in city ABC that owns a vehicle is 60% or less. A sales manager disagrees with this. He conducted a hypothesis testing surveying 250 residents and found that 170 residents responded yes to owning a vehicle.

(a) State 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

⇒ $H_0 : p \leq 0.60$
$H_1 : p > 0.60$

$n = 250 \quad x = 170 \quad \alpha = 0.10 \quad C = 0.90$

$\hat{p} = \frac{170}{250} = 0.68 \quad p_0 = 0.60$
$q_0 = 0.40$



$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 \cdot q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \cdot (0.40)}{250}}}$$

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$z = 2.58$

$1.28 < 2.58$

Reject the null hypothesis

At a 10% significance level there is enough evidence to reject the idea the owners in ABC city 60% or less

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Que 4:) What is the value of the 99 percentile?

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

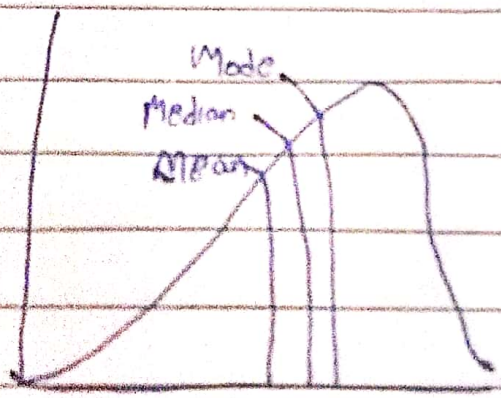
$$\text{Value} = \frac{\text{Percentile}}{100} \times (n+1)$$

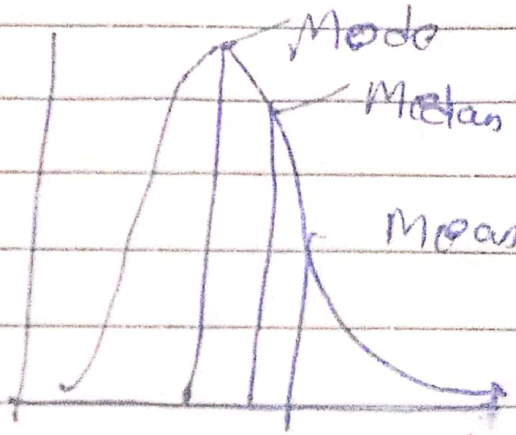
$$= \frac{99}{100} \times (21)$$

$$= 20.79 \text{ index}$$

Value = 12

Que 5) In left and right skewed data, what is the relationship between mean median and mode?
Draw the graph to represent the same





Left-Skewed

Right Skewed

If the distribution is left skewed, then, Mean < Median < Mode
If the distribution is right skewed then, Mode < Median < Mean