Qus 1) Plot a Histogram,

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

Solⁿ bin size = 10
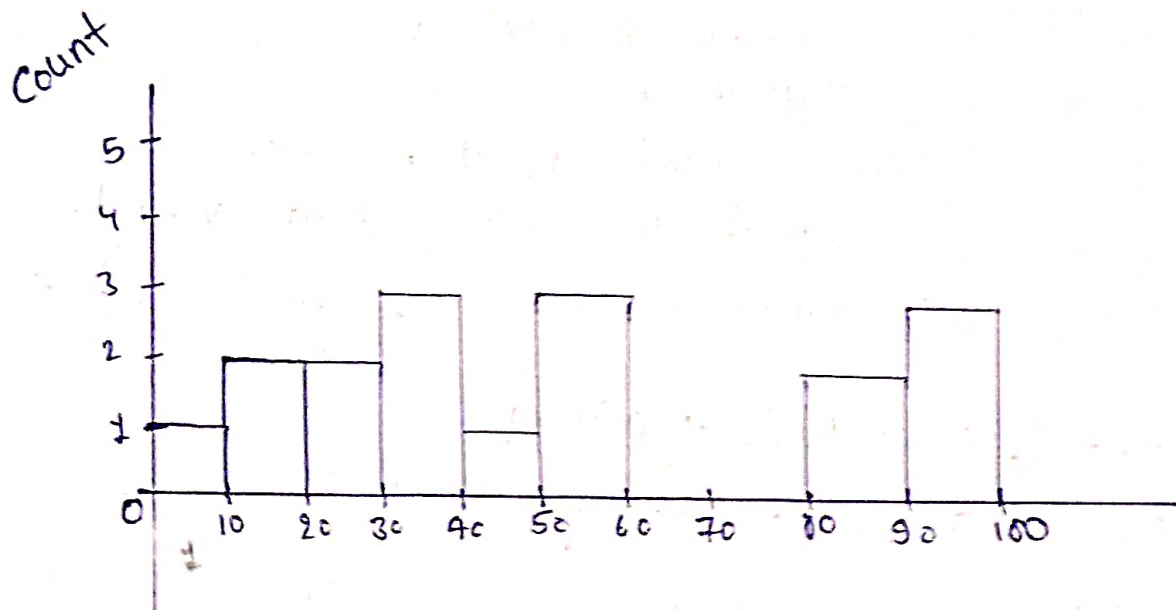

fig: Histogram.

Qus 2) In a quant test of the CAT Exam, the population Std is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the mean.

Solⁿ

$$\sigma = 100, \quad n = 25, \quad CI = 80\%, \quad \alpha = .20$$
$$\bar{x} = 520$$

CI = point estimate ± margin Error

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

$$= \left(520 \pm 1.282 \times \frac{100}{\sqrt{25}} \right)$$

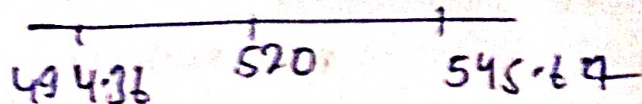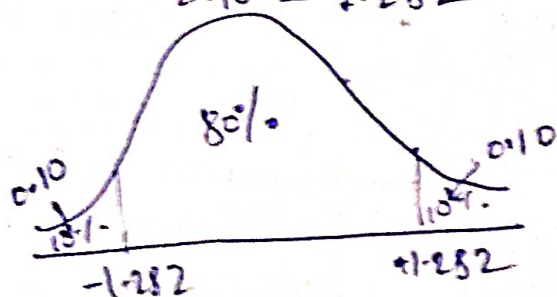$Z_{\alpha/2} = Z_{.20/2} = Z_{.10}$

$\Rightarrow 1 - 0.10$

$\Rightarrow .90$

from z-table

$Z_{.10} = 1.282$

by taking
(+) sign. CI is = 545.64

by taking
(-) sign CI is = 494.36

interval is
CI (494.36, 545.64)

494.36   520   545.64

(Suman Saini)

Ques3) A car company believes that the percentages of residents in city ABC that owns a vehicle is 60% or less. A sales manger disagree with this. He conducts a hypothesis testing surveying 250 residents and found that 170 responded yes to owning a vehicle.

a) State the Null Hypothesis
b) At 10% significance level, is there enough evidence to support the idea that vehicle owneship of company ADC is 60% or less?

Sol^n

Step 1) $Ho \to P_0 \leq 60\%$, Null Hypothesis

$H_1 \to P_0 > 60\%$. Alternate Hypothesis

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

$$x = 170 \qquad ; \quad n = 250$$

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

Step 2 $\alpha = 0.10 \qquad CI = 90\%, \quad \alpha = 1 - CF$

step 3 Z-test with proportion

$$Z = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.40}{250}}} = 2.582$$
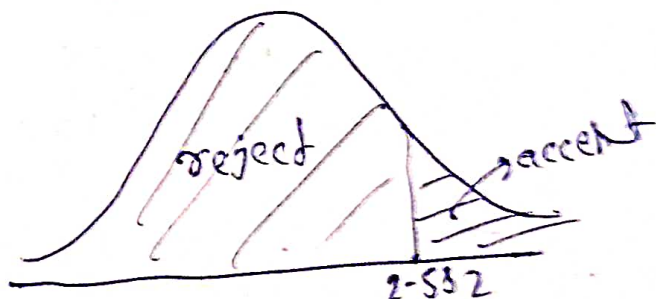
1 tail test.

step 4) decision boundary

$\alpha = .10$

$1 - 0.10 = 0.90$

from Z-table → 1.282

which is $\underline{1.282 < 2.582}$

Null hypothesis is rejected

step 5) Conclusion: Ho (Null Hypothesis is rejected)

no enough evidence to support the idea

Ques 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)

Sol^n

Value = $\dfrac{\text{Percentile}}{100} (n+1)$ 20th index $\{n = $ sample dataset
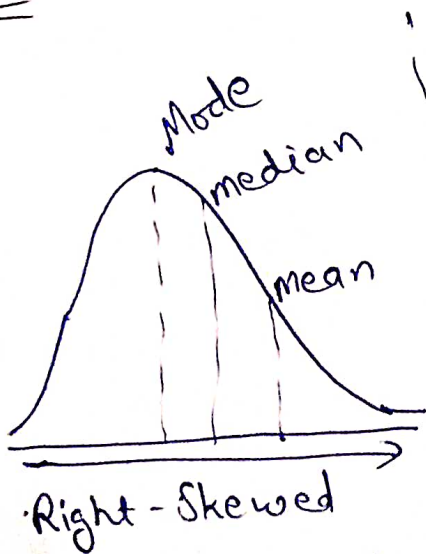
$= \dfrac{99}{100} (20+1) = 20.79$
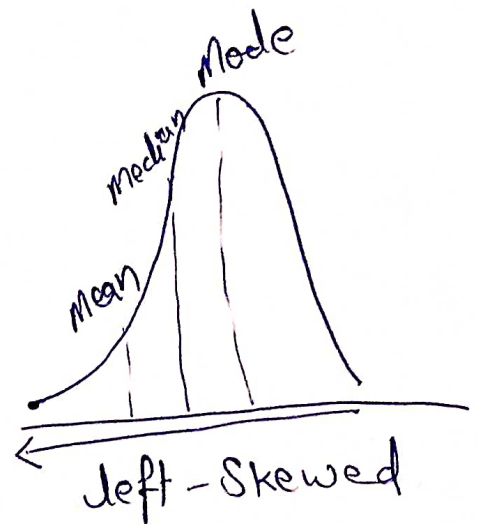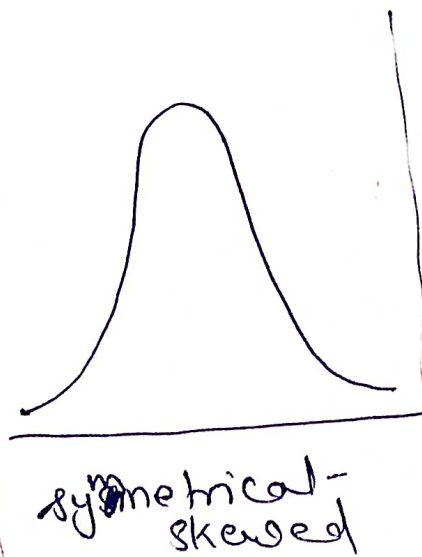
Index ≈ 20

So value is __12__

Ques 5) In left & right Skewed data, what is the relationship between mean, median & mode? Draw the graph to represent the same?

Sol^n

Mode
median
mean

·Right - Skewed

Mean > Median > Mode

Eg. Weather Distribution

symmetrical-skewed

Mode
median
mean

Left - Skewed

Mode > Median > Mean

Eg. Life span of Human-being.