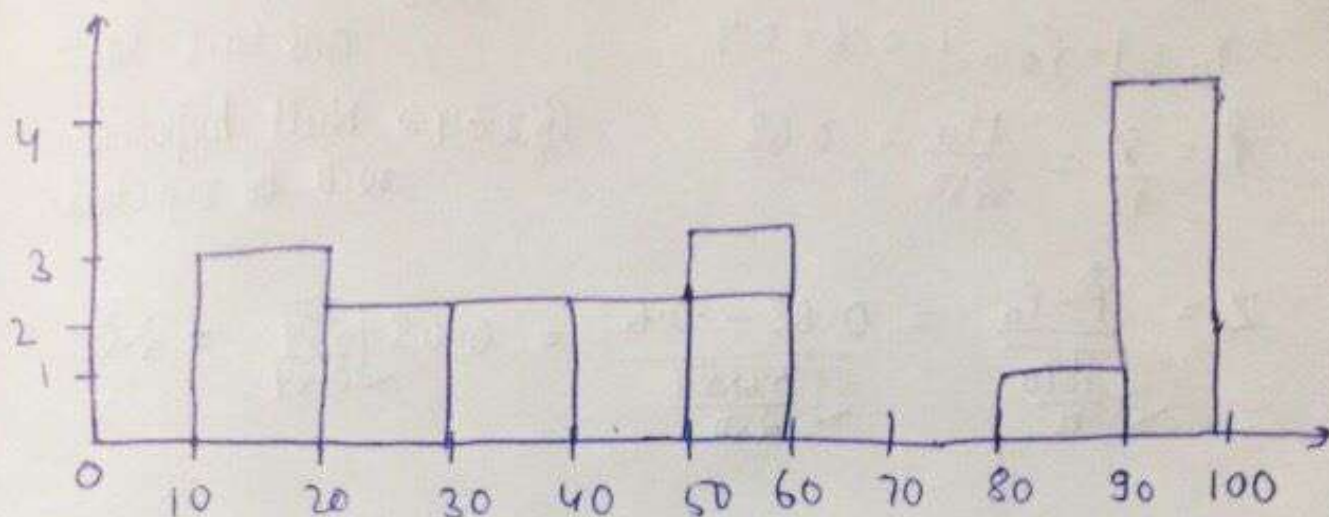


Q.1) Plot a histogram } (10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99)

Ans.)

No. of Bins = 10

Size of Bins = $\frac{100}{10} = 10$

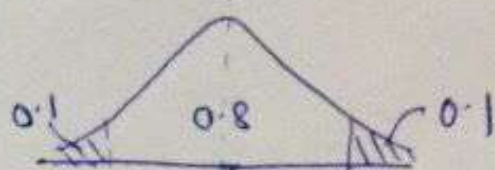


Ans.2 Population Std. (σ) = 100

Sample Size (n) = 25

Sample mean (\bar{x}) = 520

Confidence interval = 0.8 $\Rightarrow \alpha = 1 - 0.8 = 0.2$



\rightarrow Here population std. (σ) is given so we will use z table

$$Z_{\alpha/2} = Z_{0.1} = 2.33$$

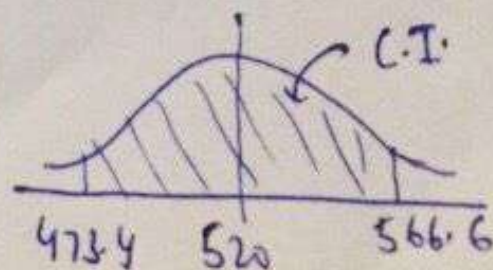
$$\text{Confidence Interval (C.I.)} = \bar{x} \pm Z_{\alpha/2} \left(\frac{\sigma}{\sqrt{n}} \right)$$

$$= 520 \pm 2.33 \left(\frac{100}{\sqrt{25}} \right)$$

$$= 520 \pm 2.33 \times 20$$

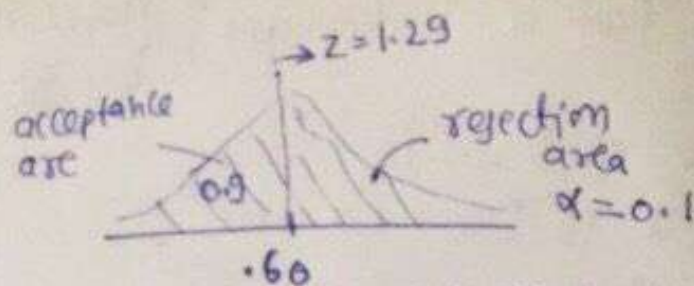
$$= 520 \pm 46.6$$

$$\text{C.I.} = [473.4, 566.6]$$



Ans ③ $H_0 = P_0 \leq 60\%$

a) $H_1 = P_0 \neq 60\%$



b) $P_0 = 0.6$

$p_0 = 1 - P_0 = 1 - 0.6 = 0.4$

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

one tail test

if $z > 1.29 \Rightarrow$ Null hypothesis will be rejected.

$$Z = \frac{\hat{p} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = 0.08 \sqrt{\frac{254}{0.24}} = 2.58$$

$\Rightarrow Z > 1.29$

Null Hypothesis will be rejected.

\hookrightarrow There is not enough evidence to support the idea that vehicle owner in ABC city is 60% or less.

Ans ④ Value of 99 percentile?

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

• $n = \text{number total} = 20$

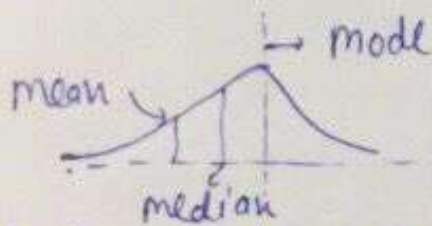
$$\text{Index number of } x\% \text{tile} = \frac{x}{100} \times n + 1$$

$$\begin{aligned}\text{Index number of 99\%tile} &= \frac{99}{100} \times 21 \\ &= 20.79\end{aligned}$$

→ Index number will be 20 (because we do not have 21st number)

⇒ Value of 20th Index number will be → 12

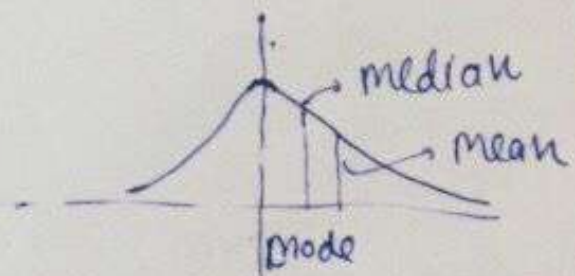
Ans. ⑤



left skewed distribution



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



Right skewed distribution



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