Question - 1

Histogram

Steps:

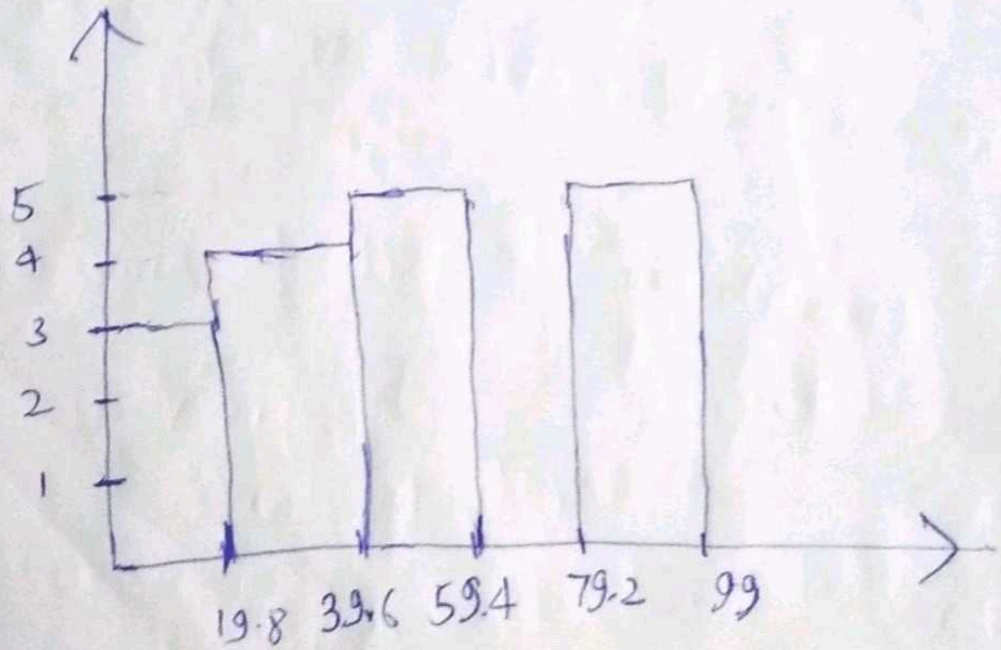
1) ~~Ascen~~ sort (Ascending)

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

2) bins (no. of group) let's say 5

bin size (size of one group) = $\frac{99}{5}$

= 19.8



Question 2

$\sigma = 100 \quad n = 25 \quad \bar{x} = 520 \quad CI: 80\%$

$\therefore \alpha = 1 - 0.80$

$= 0.20$

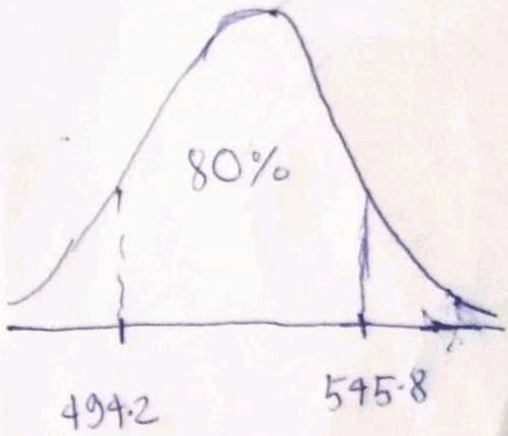
since σ given we take Z-test

$\therefore$ point estimation

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

$$Z_{\alpha/2} = Z_{\frac{0.20}{2}} = Z_{0.10} = 1.29$$

$1 - 0.10 = 0.90$



$\therefore$ point estimation

$$\bar{x} \pm 1.29 \times \frac{100}{\sqrt{25}}$$

$$= 520 \pm 1.29 \times \frac{100}{5}^{20}$$

$$= 520 \pm 25.8$$

$\therefore 520 + 25.8 \qquad 520 - 25.8$

$\Rightarrow 545.8$ (higher fence) $\Rightarrow 494.2$ (lower fence)

$\therefore$ CI about mean $\Rightarrow [494.2 \leftrightarrow 545.8]$

Question 3

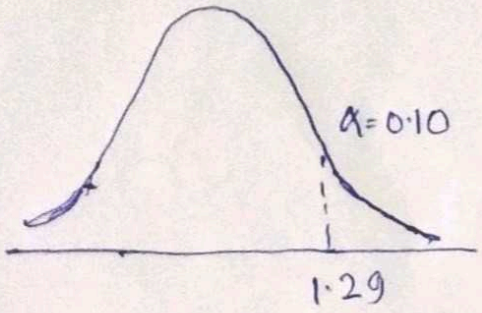
i) $H_0 \leq 60\%$ [null hypothesis]

$H_1 > 60\%$ [alternate "]

[One tail test]

ii) $\alpha = 0.10$

iii) Decision boundary



$Z > 1.29$ reject null hypothesis

iv) Finding Z score

~~P_0 (Population~~

P_0 (Probability wrt population) $= \frac{60}{100} = 0.60$

$\hat{P}$ (" " sample) $= \frac{170}{250} = 0.68$

$$Z = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0(1-P_0)}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08000}{0.03098}$$

$$= 2.582$$

$2.582 > 1.29$

$\therefore Z > 1.29$

$\therefore$ reject the null hypothesis

v) $\therefore$ Conclusion = Vehicle owner in ABC city is more than 60%

Question 4

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

for 99 percentile,

$$\frac{99}{100} \times (n+1)$$

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

$$\frac{99}{100} \times 21$$

$$\frac{2079}{100}$$

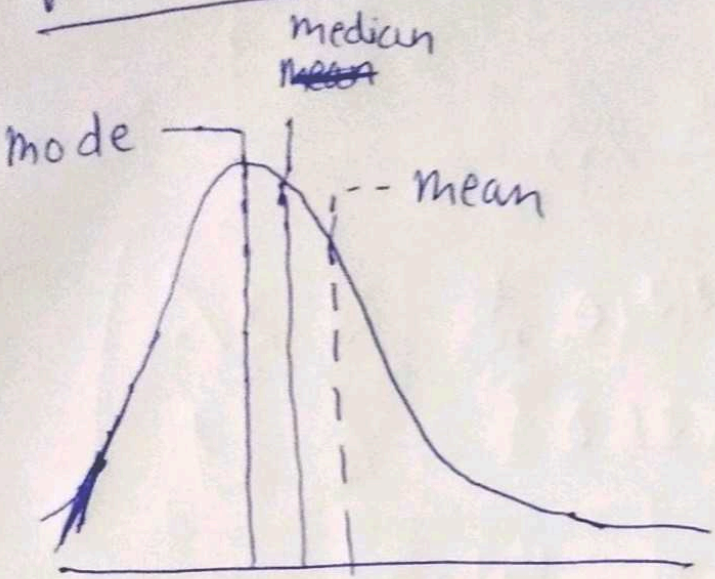
$$20.79$$

6. ~~[illegible]~~

Since 21st index ~~[illegible]~~ does not exist we will consider only 20th index.

∴ in this case value of 99 percentile is 12 Ans.

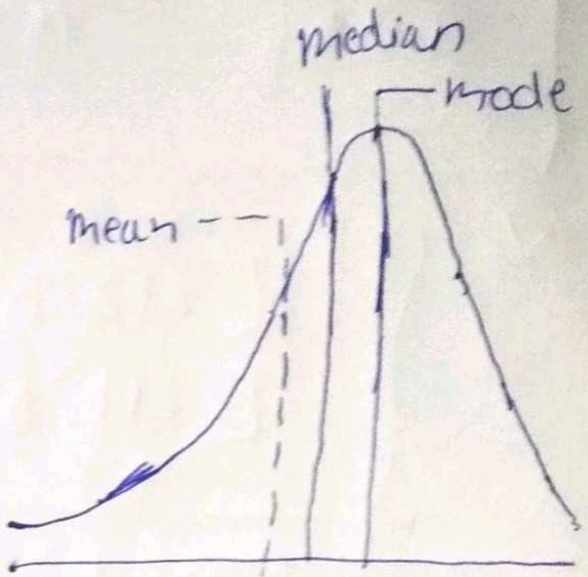
Question 5



Right skew

relation between
mean, median, mode

mean > median > mode



left skew

relation between
mean, median, mode

mean < median < mode