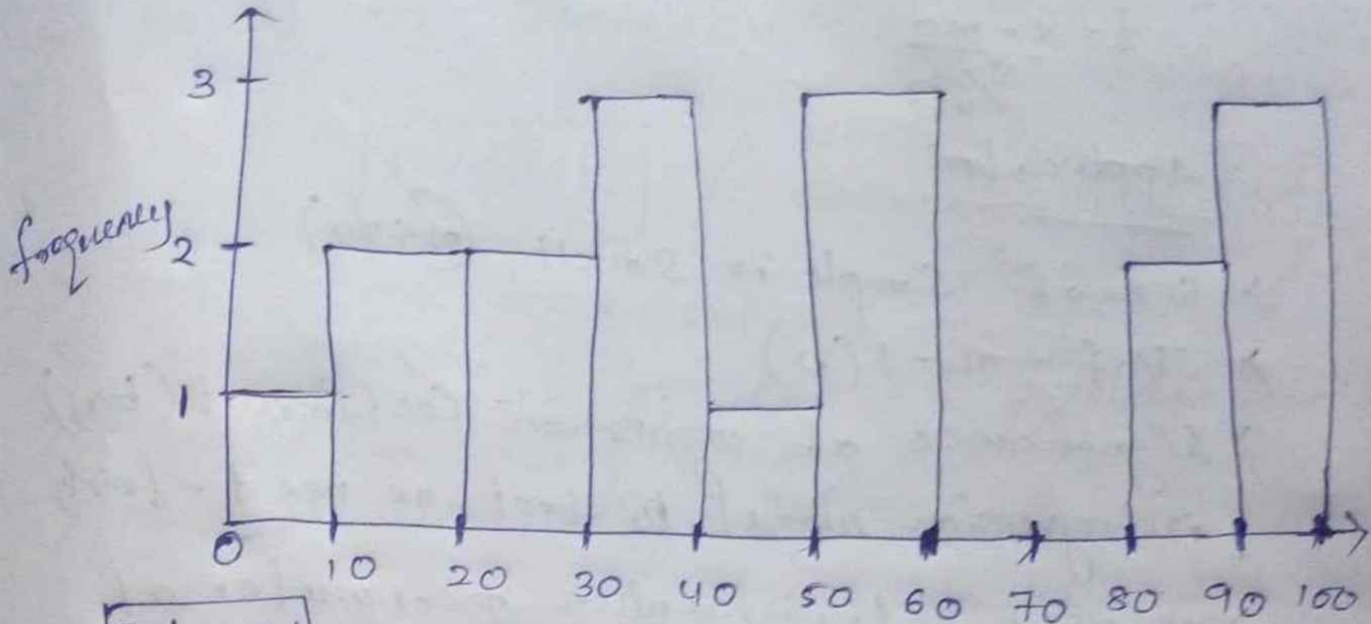
Q1 (A) Plot a histogram

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

0 − 100

$\boxed{\text{Bins} = 10}$ $\boxed{\text{Bin Size} = \frac{100}{10} = 10}$



$\boxed{\text{Interval}}$ f

0 − 10 → 1

10 − 20 → 2

20 − 30 → 2

30 − 40 → 3

40 − 50 → 1

50 − 60 → 3

60 − 70 → 0

70 − 80 → 0

80 − 90 → 2

90 − 100 → 3

Q2 (1) Given

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

To construct

C.I at 80% confidence level

Thus level of significance

$\Rightarrow \alpha = 20\%$

$\Rightarrow \alpha = 0.2$ then $\frac{\alpha}{2} = 0.1$

So

Lower fence $= \bar{x} - z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$= 520 - 1.282 \times \frac{100}{\sqrt{25}}$

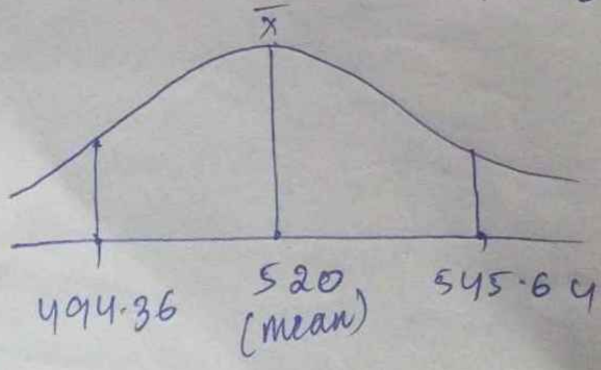
$= 520 - 1.282 \times \frac{100}{5}$

$= 494.36$

Higher fence $= \bar{x} + z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$= 520 + 1.282 \times 20$

$= 545.64$



Q3)A)

a) (A) H_0 (null hypothesis) : $P_0' \geq 60\%$

H_1 (Alternative hypothesis) : $P_0 < 60\%$

b) (A) $n = 250$

out of which 170 responded (yes)

$$P' = \frac{170}{250} = 0.68$$

Now $q_0 = 1 - P_0 = 1 - 0.6$

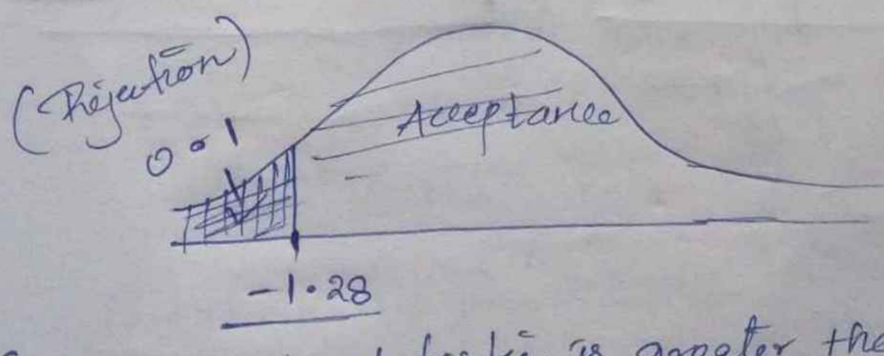
(Test statistic) $\boxed{q_0 = 0.4}$ $\boxed{P_0 = 0.6}$

$$z\text{-test} = \frac{P' - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08}{\sqrt{0.00096}} = \boxed{2.58}$$

Given At 10% significance level

ie $\boxed{0.1}$ $\boxed{\text{One - tailed}}$ (left-tailed)



Since test-statistic is greater than -1.28 ie critical value $\therefore$ We $\boxed{\text{accept Null hypothesis}}$.

Q4) A) 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

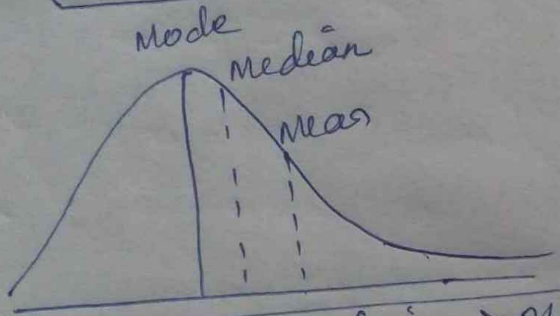
$$\text{Rank} = \frac{\text{Percentile}}{100} \times N \quad (N = \text{no. of values in the dataset})$$

$$= \frac{99}{100} \times 20 = 19.8 \approx 20$$

So, the value will be $\boxed{12}$ Ans

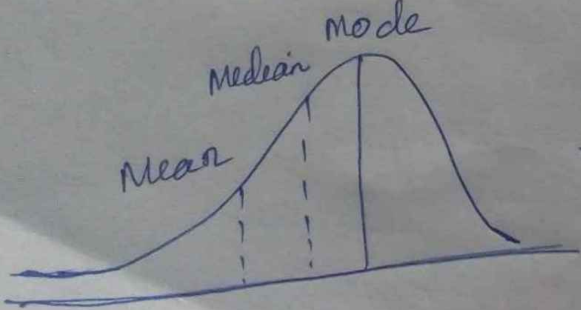
Q5 (A)

Right - Skewed



Mean > Median > Mode

Left - Skewed



Mode > Median > Mean