Que 1) Plot a histogram,

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

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.

Que 3) A car believes that the percentage of citizens 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 & found that 170 residents responded yes to owning a vehicle.

a) State the null & 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.

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

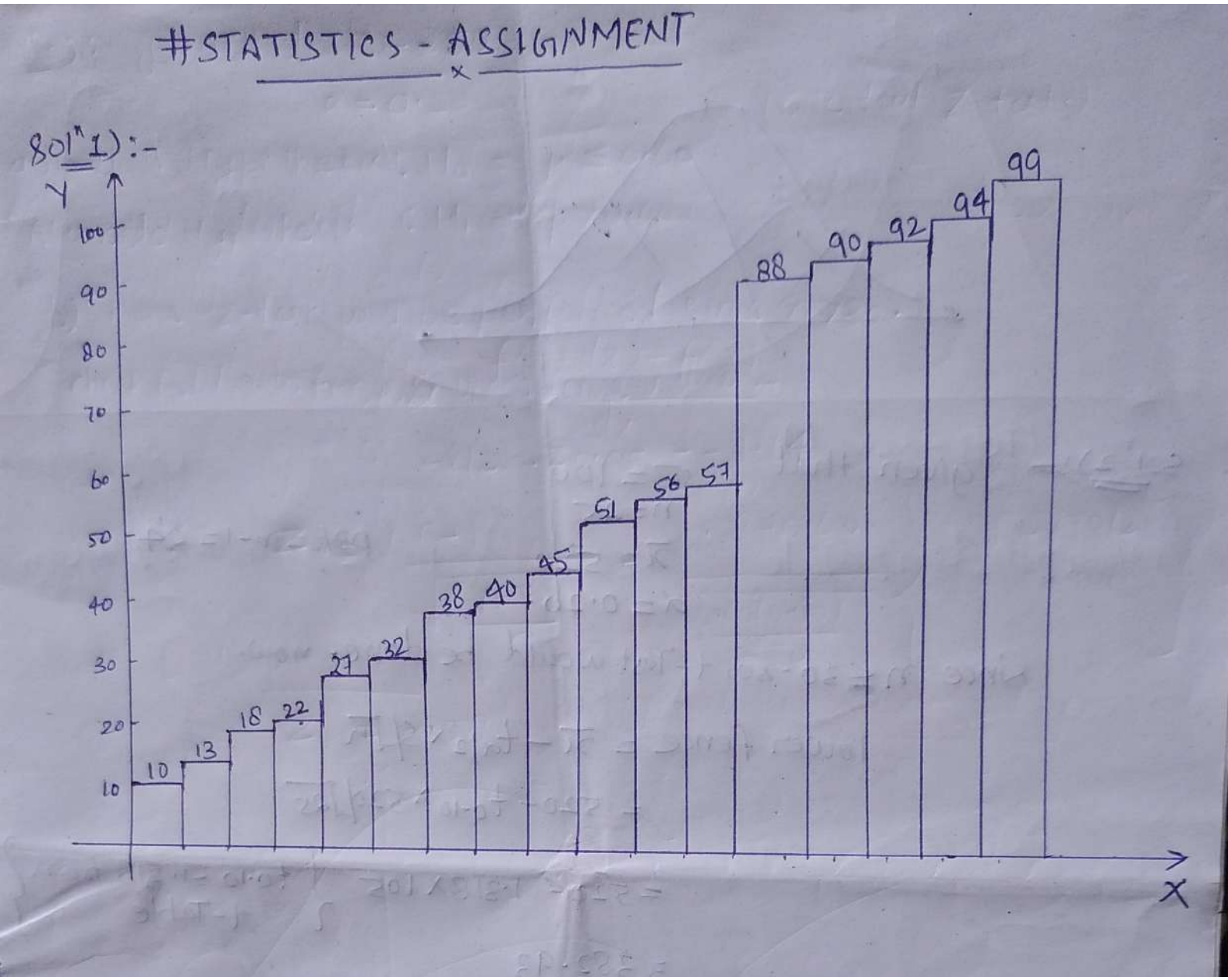
2,2,3,4,5,5,5,6,7,8,8,8,8,8,9,9,10,11,11,12

Que 5) In left & right-skewed data, what is the relationship between mean, median & mode?

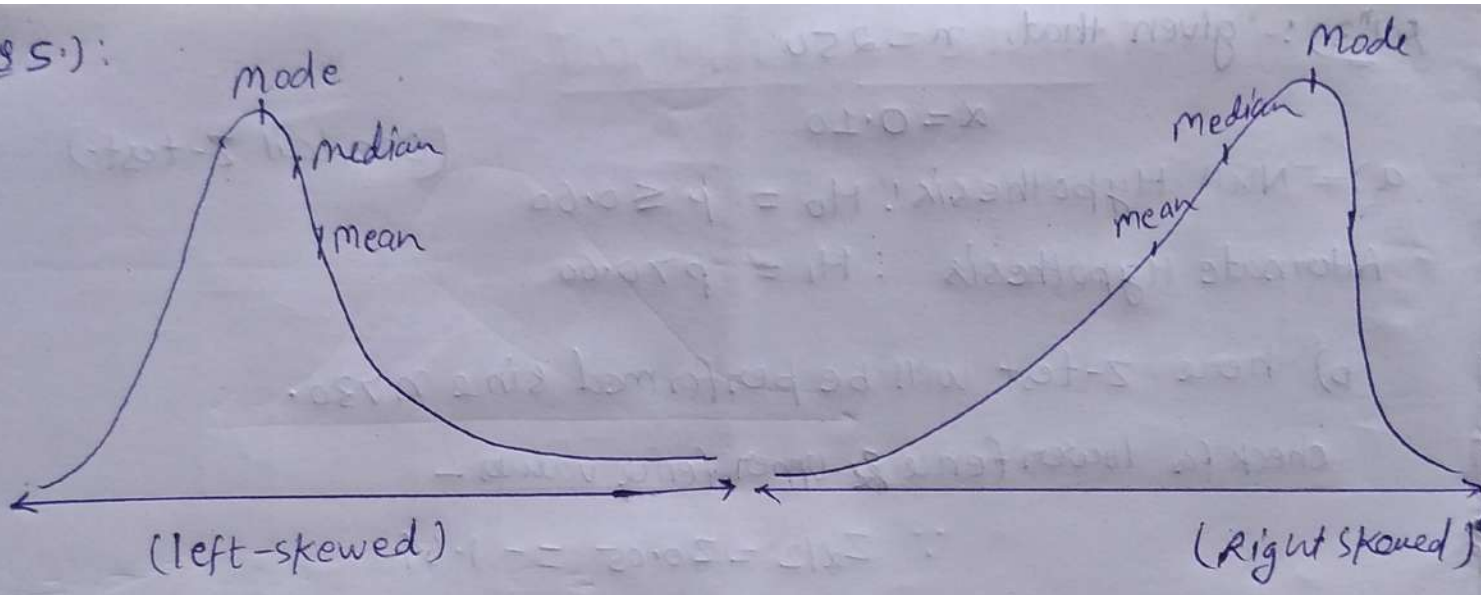
Draw the graph to represent the same.

#STATISTICS - ASSIGNMENT

Soln 1):-



Ans 5.):



Mean > Median > Mode

Mode > Median > Mean

Sol^{n} 3) :- given that, $n = 250$

$\alpha = 0.10$ (one tail z-test.)

a) Null Hypothesis : $H_0 = p \leq 0.60$

Alternate Hypothesis : $H_1 = p > 0.60$

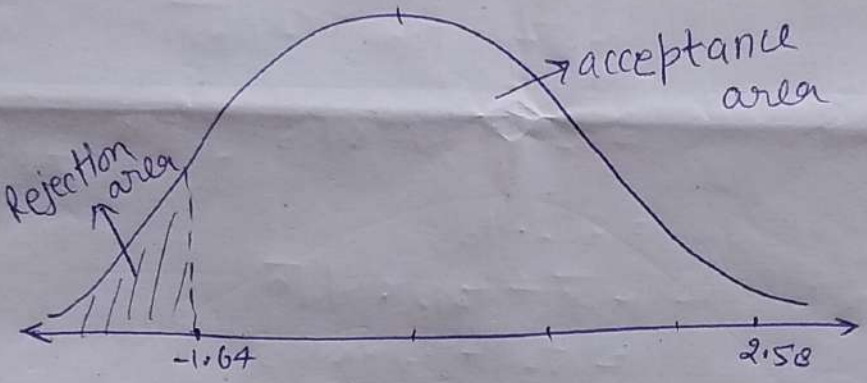
b) here, z-test will be performed since $n > 30$.

check for lower fence & upper fence values -

$\because Z_{\alpha/2} = Z_{0.05} = -1.64$

$$\therefore Z_0 = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60(0.40)}{250}}} \left\{ \because \hat{p} = 170/250 = 0.68 \right\}$$

$Z_0 = 2.58$



$\because Z_0 = 2.58$ lies in acceptance area.

we accept H_0. i.e.

Vechicle owner in ABC City is 60 % or less.

Sol^{n} 4) :-

we have,

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

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

$$\text{value} = \frac{99}{100}(19) = 18.81$$

Average of 18th & 19th value $= \frac{11+11}{2} = 11$. Ans

99 percentile value = 11.

Soln 2):- given that $\sigma = 100$

$n = 25$

$\bar{x} = 520$

$\alpha = 0.20$

$DOF = n - 1 = 24$

since $n \leq 30$. so, t-Test would be done. now,

$$\text{lower fence} = \bar{x} - t_{\alpha/2} \times s/\sqrt{n}$$

$$= 520 - t_{0.10} \times 520/\sqrt{25}$$

$$= 520 - 1.318 \times 105 \quad \{ t_{0.10} = 1.318 \text{ from t-Table} \}$$

$$= 382.93$$

$$\text{upper fence} = \bar{x} + t_{\alpha/2} \times s/\sqrt{n}$$

$$= 520 + 1.318 \times 105$$

$$= 657.07 \text{ . so.}$$