Que 1) Plot a histogram,

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

Bins       = 5

Bin Size = 20

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Frequency |  |  |  |  |  |  |  |
|  | 8 |  |  |  |  |  |  |  |
|  | 7 |  |  |  |  |  |  |  |
|  | 6 |  |  |  |  |  |  |  |
|  | 5 |  |  |  |  |  |  |  |
|  | 4 |  |  |  |  |  |  |  |
|  | 3 |  |  |  |  |  |  |  |
|  | 2 |  |  |  |  |  |  |  |
|  | 1 |  |  |  |  |  |  |  |
|  | 0 | 20 | 40 | 60 | 80 | 100 | 120 |  |
|  |  |  |  |  |  |  |  |  |

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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.

σ = 80, n = 25, x-bar = 520, C.I. = 80%

= Point estimate ± Margin of error

= x-bar ± Zα/2 \* (σ / SQRT(n))

= 520 ± Z0.10 (80/5)

= 520 ± Z0.10 (80/5)

From Z-Table Z0.10 = 2.32

Lower fence = 520 – 2.32 \* 16 = 482.88

Higher fence = 520 + 2.32 \* 16 = 557.12

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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.

1. State the null & alternate hypothesis.
2. At a 10% significance level, is there enough evidence to support the idea that vehicle owner in ABC city is 60% or less.

**Step 1 :**

Null Hypothesis - H0 : P0 = 60% (owns a vehicle)

Alternate Hypothesis - H0 : P0 ≠ 60% (not owns a vehicle)

**Step 2 :**

Given : n = 250, x = 170, p-bar = 170/250 = 0.68, α = 0.10

q0 = 1 – p0 = 1 – 0.60 = 0.40

**Step 3 :**

Z-test with proportions

z-test = (p-bar – p0) / Sqrt (p0. q0) / n

= 0.68 – 0.60 / sqrt( 0.60 \* 0.40) / 250

= 0.08 / sqrt(0.24 / 250) = 2.5819

From Z-Table -> Z2.58 = 0.9951

p-value = 1 – 0.9951 = 0.0049 + 0.0049 = 0.0098

if p-value < α, 0.0098 < 0.10 -

We are rejecting Null hypothesis and accepting alternate hypothesis that 60% doesn’t own a vehicle

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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

n th Percentile = (P / 100) \* (N + 1)

99th Percentile = (99 / 100) \* 21 = 19.8th Index which means (11 + 12) / 2 ~ 11.5 to 11.8

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

Draw the graph to represent the same.

**Left Skewed Distribution:** Mean < Median < Mode

Chart

Description automatically generated

**Right Skewed Distribution:** Mean > Median > Mode

A picture containing chart

Description automatically generated