Q5 A car company believes that the [illegible] of residents in city ABC that owns a vehicle is 60% or less. A sales manager disagree with this. He conduct a hypothesis testing survey 250 residents and found that 170 responded yes to owning a vehicle

(a) State the Null & Alternate Hypo

Pvalue = 0.014

(b) At 10% significance level, is there enough evidence to support the idea that vehicle ownership in ABC is 60% or less?

Sol:

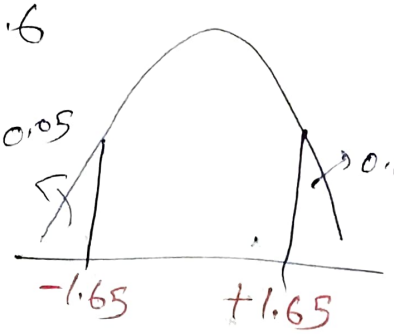
$n = 250$ $x = 170$

$p_0 = 0.6$

$q_0 = 1 - 0.6 \Rightarrow 0.4$

$\hat{p} = \frac{170}{250} \Rightarrow 0.68$

$\alpha = 0.1$



$C = 1 - \alpha \Rightarrow 0.9$

$$Z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}} \Rightarrow \frac{0.68 - 0.6}{\sqrt{\frac{(0.6)(0.4)}{250}}} \Rightarrow \frac{0.08}{\sqrt{\frac{0.24}{250}}}$$

$Z = 0.0309$

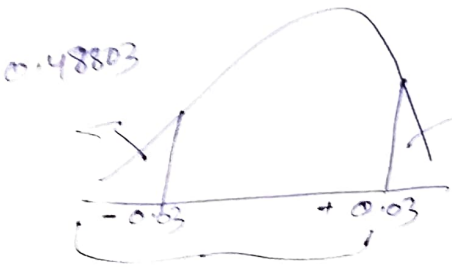
from Z table

$1 - 0.05 \Rightarrow 0.95$

As Z value is < 1.65.

accept Null Hypo

By P-value :-



$= 1 - 0.51197$
$= 0.48803$

0.51197

Pvalue = 0.48803 + 0.48803

$= 0.97606$