Procedure for Testing of Hypothesis

Step1: Set up null Hypothesis H_0

$H_0 : \mu = \mu_0$; $H_0 : \mu_1 > \mu_2$; $H_0 : \sigma_1^2 \neq \sigma_2^2$

Step2: Set up Alternative hypothesis H_1
(Decide one tailed or two-tailed)

$H_0 : \mu = \mu_0$; $H_1 : \mu \neq \mu_0$ ($\mu > \mu_0$, $\mu < \mu_0$) } Two-Tailed
(one population)

$H_0 : \mu_1 = \mu_2$; $H_1 : \mu_1 \neq \mu_2$ } Two-Tailed
(two populations)

$H_0 : \mu \leq \mu_0 \ (\geq \mu_0)$; $H_1 : \mu > \mu_0 \ (< \mu_0)$
(one population)

$H_0 : \mu_1 \leq \mu_2 \ (\mu_1 \geq \mu_2)$; $H_1 : \mu_1 > \mu_2 \ (< \mu_2)$
(Two population)

→ one-Tailed

Step3: Level of Significance
α at 1% (or) 5%

Procedure for Testing of Hypothesis

Step 4: Test Statistic

Test Statistic = $\dfrac{\text{Statistic} - \text{Value of the parameter under } H_0}{\text{Standard error of the statistic}}$

For Normal: (For Large Sample)

$$Z = \frac{|t - E(t)|}{SE(t)}$$

(OR)

$$|Z| = \frac{t - E(t)}{SE(t)}$$

Statistic

$$= \frac{|\bar{x} - \mu|}{\sigma/\sqrt{n}} \quad \left(\sigma/\sqrt{n} \rightarrow SE\right)$$

(χ^2, t, F) — distributions

Procedure for Testing of Hypothesis

Step5 : CONCLUSION :

- If $Z_{cal} < Z_{\alpha}$ (or) $|Z|_{(cal)} < Z_{\alpha}$ (Step4)

  (Z_{α} → Critical value@α)

  we say that it is NOT Significant

  ∴ The Null hypothesis is Accepted.

- If $Z_{cal} > Z_{\alpha}$ (or) $|Z|_{(cal)} > Z_{\alpha}$

  we say that it is significant

  ∴ The Null hypothesis is Rejected

Given $\mu = \mu_0 = 200$ ml

$n = 100$

$\bar{x} = 201.3$ ml

$\sigma = 5$ ml

Null Hypothesis: H_0: The Machince is functioning Properly

(OR)

$H_0 : \mu = 200$

Alternate Hypothesis $H_1 : \mu \neq 200$ } (Two-tailed Test)

Level of Significance: $\alpha = 5\%$

Test Statistic: $Z = \dfrac{|\bar{x} - \mu|}{\sigma/\sqrt{n}}$

$= \dfrac{|201.3 - 200|}{5/\sqrt{100}}$

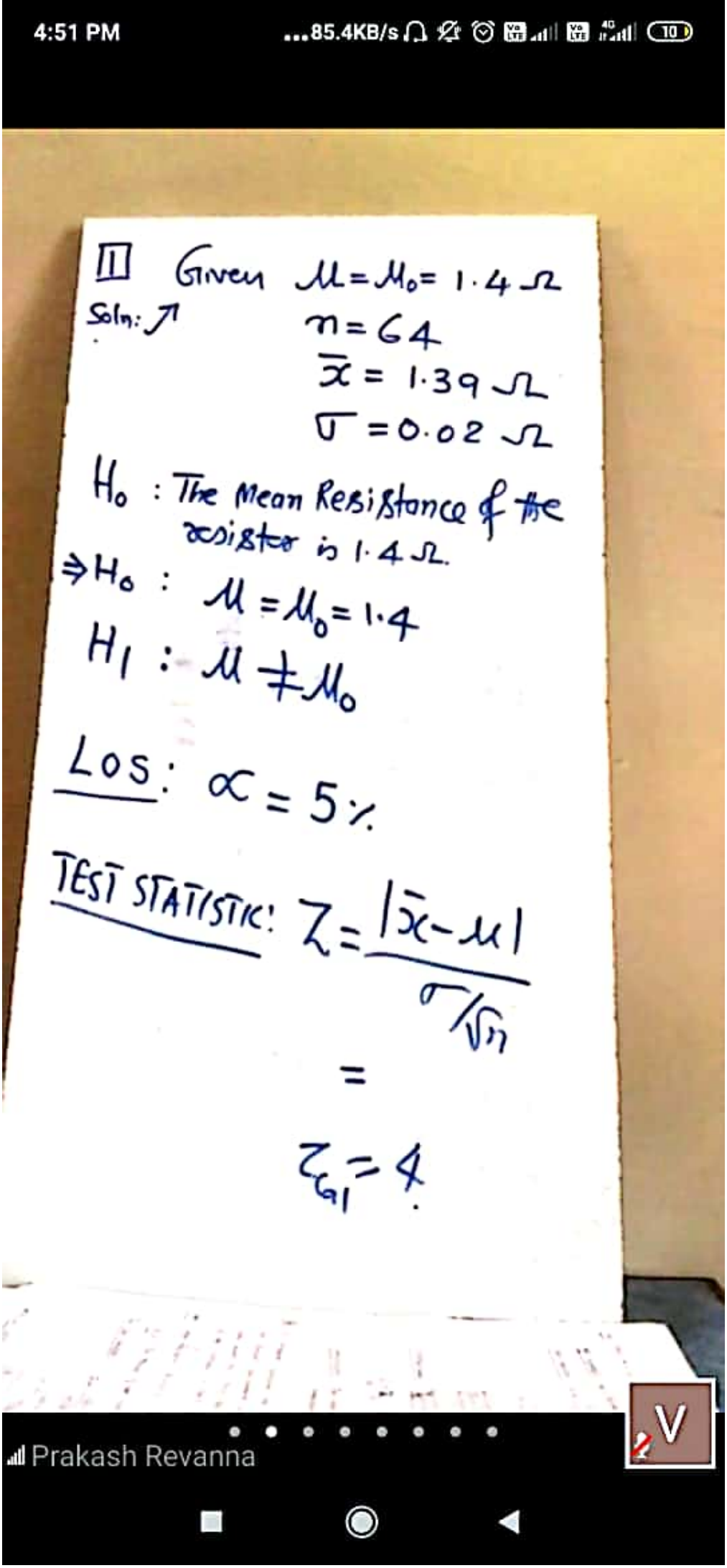
$\therefore Z_{cal} = 2.6$

Also, @ $\alpha = 5\%$: $Z_\alpha = 1.96$

CONCLUSION: $\boxed{Z_{cal} > Z_\alpha}$

$\Rightarrow H_0$ is REJECTED

$\therefore$ The Machine is NOT working properly.



CONCLUSION:

$\sigma = 0.02\ \Omega$

@ $\alpha = 5\%$

$Z_\alpha = 1.96$

$\therefore \boxed{Z_{cal} > Z_\alpha}$

$\Rightarrow$ Ho is Rejected

$\therefore$ The mean resistance of the resistor is Not 1.4.