# Analysis of Hypothesis Testing in Electrical Circuit Inspection

To address this question, I need to carefully analyze the logic of hypothesis testing as applied to the electrician's scenario.

Given information:

- Null hypothesis (H₀): Circuit is good (not defective)

- Alternative hypothesis (H₁): Circuit is not good (defective)

- The electrician's instrument sometimes fails to detect that a circuit is good

- Question asks what is true when the electrician rejects the null hypothesis

When the electrician rejects the null hypothesis, they are concluding that there is sufficient evidence to believe the circuit is defective. However, in hypothesis testing, rejecting H₀ doesn't provide absolute certainty.

Evaluating each option:

(A) "The circuit is definitely not good and needs to be repaired."

This overstates the certainty of hypothesis testing. Rejecting H₀ means there's statistical evidence against the circuit being good, but not definitive proof.

(B) "The electrician decides that the circuit is defective, but it could be good."

This correctly captures the nature of hypothesis testing. When rejecting H₀, the electrician has made a decision based on evidence that the circuit is defective, while acknowledging the possibility of a Type I error (rejecting a true null).

(C) "The circuit is definitely good and does not need to be repaired."

This contradicts the rejection of H₀, so it cannot be correct.

(D) "The circuit is most likely good, but it could be defective."

This contradicts the rejection of H₀. If the electrician rejects the null hypothesis, they believe the circuit is most likely defective, not good.

Therefore, the correct answer is (B).