# Response to Multiple Choice Question

The correct answer is (B) causal inference.

## Explanation:

Random assignment of treatments to experimental units is a fundamental principle in experimental design that specifically enables causal inference. When we randomly assign units to treatment conditions, we create groups that are probabilistically equivalent on all pre-existing variables (both measured and unmeasured). This equivalence means that any systematic differences observed between groups after treatment can be attributed to the treatment itself, rather than to confounding variables.

It's important to note that random assignment is distinct from random sampling:

- \*\*Random assignment\*\* creates comparable groups within the experiment, allowing us to conclude that treatment causes the observed effect (causal inference).

- \*\*Random sampling\*\* involves selecting units randomly from a population, which is what allows us to generalize our findings back to that population (population inference).

Answer (A) is incorrect because random assignment alone does not ensure that our findings generalize beyond our experimental units. For population inference, we would need random sampling from the target population.

Answer (C) is incorrect because random assignment only ensures causal inference. To have both causal and population inference, we would need both random assignment of treatments and random sampling of units from the target population.

Answer (D) is incorrect because random assignment clearly enables causal inference.