Part I: Hypotheses (30% of total, 10% each) Directions: Rewrite the following hypotheses to improve them (5 points), and explain why each rewritten hypothesis is a better social science hypothesis than the original one (5 points).

A. Living in California makes people liberal.

B. Taxes hurt the economy.

C. Getting a good job depends on knowing the right people.
Part II: Measurement (30% of total, 15% each) Directions: For the following two concepts, briefly describe (1) how one might measure the concept, (2) how one could assess the measure’s reliability and (3) how one could assess the measure’s validity. You can use “face validity” for only one of the two concepts.

A. Gun ownership rates by county

B. Citizen compliance with federal income tax laws
Part III: Research Design (30% of total)

The mayor of Los Angeles, having read about the use of job training programs in other cities, is thinking about adopting one for his city. First, however, the mayor wants to know if the programs work as intended. The mayor has hired you, a social scientist, to answer the following research question: Do job-training programs reduce reliance on public assistance in low-income neighborhoods?

Describe how one could address this research question with (1) an experimental research design and (2) a non-experimental (observational) research design. In terms of internal and external validity, what are the strengths and weaknesses of each approach to this research question?
Part IV: Experimental Effects (10% of total)

Using the notation from lecture, answer the following two questions. Show your work.

A. Given a simple post-test design as follows:

   **Simple Post-Test Design**
   
   \[
   \begin{array}{ccc}
   R & X & 10 \\
   R & 6 \\
   \end{array}
   \]

   (1) What is the treatment effect?

   (2) In one sentence, what assumption must one make about the two groups in order to compute treatment affect in (1)?

B. Given a Solomon four-group design as follows:

   **Solomon four-group design**
   
   [Numeric entries denote test scores]
   
   \[
   \begin{array}{ccc}
   R & 10 & X & 20 \\
   R & 10 & 14 \\
   R & X & 17 \\
   R & 11 \\
   \end{array}
   \]

   Assume that these are student test scores. Make the same assumption as in part (2) of the previous question. Further assume that you know that there are only three factors that affect the test scores—the treatment, testing effects, and history.

   (1) What is the treatment effect?

   (2) What is the effect of testing?

   (3) What is the effect of history?