

## ***Practice Problems***

### **Problem 10.1:**

Suppose the mean cholesterol levels are to be compared for adults in four socioeconomic classes—poverty, low income, middle income, and high income. If random samples of each socioeconomic class are selected to make the comparison, identify each of the following elements of the experiment.

- (a) Response
- (b) Factor(s) and factor type(s)
- (c) Treatments
- (d) Experimental units

**Problem 10.2:**

Brief descriptions of a number of experiments are given next. Determine whether each is observational or designed, and explain your reasoning.

- (a) An economist obtains the unemployment rate and gross state product for a sample of states over the past 10 years, with the objective of examining the relationship between the unemployment rate and the gross state product by census region.
- (b) A psychologist tests the effects of three different feedback programs by randomly assigning five rats to each program and recording their response times at specified intervals during the program.
- (c) A marketer of computers runs ads in each of four national publications for one quarter, and keeps track of the number of sales that are attributable to each publication's ad.
- (d) An electric utility engages a consultant to monitor the discharge from its smokestack on a monthly basis over a 1-year period in order to relate the level of sulfur dioxide in the discharge to the load on the facility's generators.
- (e) Intrastate trucking rates are compared before and after governmental deregulation of prices charged, with the

comparison also taking into account distance of haul, goods hauled, and the price of diesel fuel.

- (f) An agriculture student compares the amount of rainfall in four different states over the past 5 years.