E

18. Data were collected in 20 cities on the percentage of women in the workforce. Data were collected in 1990 and again in 1994. Gains, or losses, in the percentage were the measurement upon which the studies conclusions were to be based. What kind of design was this?

I. A matched pairs design
II. An observational study
III. An experiment using blocking design

a) I only b) II only c) III only d) I and III only e) I and II only

B

19. Your company has developed a new treatment for acne. You think men and women might react differently to the medication, so you separate them into two groups. Then the men are randomly assigned to two groups and the women are randomly assigned to two groups. One of the two groups is given the medication and the other is given a placebo. The basic design of this study is

a) completely randomized
b) comparative randomized, stratified by gender
c) comparative randomized, blocked by gender
d) randomized, blocked by gender and type of medication
e) a matched pairs design

FRQs

20. You want to determine how students in your school feel about a new dress code for school dances. One faction in the student council, call them group A, wants to word the question, "As one way to help improve student behavior at school sponsored events, do you feel that there should be a dress code for school dances?" Another group, group B, prefers, "Should the school administration be allowed to restrict student rights by imposing a dress code for school dances?" Which group do you think favors a dress code and which opposes it? Why? What kind of bias is present? How would you pose the question for the survey to avoid bias? A-favor B-oppose. Question wording bias. A tries to sway by pointing out positives, B mentions restricting rights (negative).
Q: Should school dances have a dress code?

21. Various claims are often made for surveys. Why is each of the following claims not correct?

a) It is always better to take a census than to draw a sample. Time, money
b) Stopping students on their way out of the cafeteria is a good way to sample if we want to know about the quality of the food there. opinions strong / biased
c) We drew a sample of 100 from the 3000 students in a school. To get the same level of precision for a town of 30,000 residents, we will need a sample of 1000. school pop diff from town
d) A poll taken at our favorite Web site (www.statsisfun.org) garnered 12,357 responses. The majority said they enjoy doing statistics homework. With a sample size that large, we can be pretty sure that most Statistics students feel this way, too. stats is fun caters to stat students - Online undercoverage
e) The true percentage of all Statistics students who enjoy the homework is called a "population statistic." parameter.

22. In a large city school system with 20 elementary schools, the school board is considering the adoption of a new policy that would require elementary students to pass a test in order to be promoted to the next grade. The PTA wants to find out whether parents agree with this plan. Listed below are some of the ideas proposed for gathering data. For each, indicate what kind of sampling strategy is involved and what (if any) biases might result.

a) Put a big ad in the newspaper asking people to log their opinions on the PTA Web site. vol. resp. Bias b/c opinions.
b) Randomly select one of the elementary schools and contact every parent by phone. cluster. Undercoverage
c) Send a survey home with every student, and ask parents to fill it out and return it the next day. Census Non-response
d) Randomly select 20 parents from each elementary school. Send them a survey, and follow up with a phone call if they do not return the survey within a week. Stratified (multi-stage possibly).

23. Here's the opening of a press release from June 2004: "Starbucks Corp. on Monday said it would roll out a line of blended coffee drinks intended to tap into the growing popularity of reduced-calorie and reduced-fat menu choices for Americans." You wonder if Starbucks customers like the new "Mocha Frappuccino Light" as well as the regular version of this coffee.

a) Describe a completely randomized design using 40 Starbucks customers that would help answer this question. Be sure to discuss blinding.
b) A friend of yours in AP Statistics says no, that adults and teenagers have different tastes and suggests that a better way of designing an experimental study is to use a blocking design. Describe that type of experiment.
c) But later in the day, a Stats teacher poked you and said that he thought a matched pairs design was the best method. How would design this experiment?

a) Assign customers a #1-40. Put all into "hat" have 20 taste reg. + 20 taste light. Blind - customers don't know which they taste.
b) Split customers into even blocks - adult + teen. Then randomly assign for each group as in a). Same blindings.
c) Each customer tastes both types randomly, have water in between.

24. Read the following brief article about aspirin and alcohol.

Aspirin may enhance impairment by alcohol

Aspirin, a long time antidote for the side effects of drinking, may actually enhance alcohol's effect, researchers at the Bronx Veterans' Affairs Medical Center say. In a report on a study published in the *Journal of the American Medical Association*, the researchers said they found that aspirin significantly lowered the body's ability to break down alcohol in the stomach. As a result, five volunteers who had a standard breakfast and two extra-strength aspirin tablets an hour before drinking had blood alcohol levels 30 percent higher than each had when they drank alcohol alone. Each volunteer consumed the equivalent of a glass and a half of wine.
That 30 percent could make the difference between sobriety and impairment, said Dr. Charles S. Lieber, medical director of the Alcohol Research and Treatment Center at the Bronx center, who was co-author of the report with Dr. Risto Roine.

(a) Explain why this is an experiment and not an observational study. They took the aspirin as a result / following the
(b) Identify the explanatory and response variables. exp - aspirin resp - blood alcohol level report. Treatment was imposed.
(c) Identify the experimental design used in this study. Justify your answer.
(d) In the second sentence above is the phrase, "…researchers said they found that aspirin significantly lowered the body's ability to break down alcohol…" What is the statistical meaning of the word "significantly" in the context of this study? The results [redacted] differ by more than we would expect by chance alone,
(e) This was a controlled experiment. Describe how it was controlled and explain the purpose of doing so.

c) Sounds like matched pairs. Each volunteer had breakfast & consumed 1.5 glasses of wine. They also [redacted] did this alone and did this w/ aspirin. Compared results. Hopefully they randomized the order of aspirin vs. none.

e) Each volunteer controlled themselves by doing aspirin vs. no aspirin - always had breakfast or wine. Had a baseline for comparison using themselves.