Exam II Choice B (Unit 3 – Populations and Samples)

Due Monday October 20, 2014
Last submission date for credit: Monday October 27, 2014

Clarification.
This is the Unit 3 Test – Populations and Samples and is Examination II Choice B.
Examination II is satisfied with by taking either: Unit 2 Test (Probability) or Unit 3 Test (Sampling) or both.

(1) You submit Examination II Choice A (Unit 2 Test – Probability); or
(2) You submit Examination II Choice B (Unit 3 Test – Populations and Samples); or
(3) You submit BOTH Examination II Choices A and B

Note - If you choose to attempt both choices A and B, I will take the higher grade.

Instructions and Checklist:
__1. Start each problem on a new page.
__2. Write your name on every page.
__3. Make a photocopy of your exam for safekeeping prior to submission
__4. Complete the signature page.

How to submit your exam:

Worcester “In-Class” Section

__1. Bring your completed exam to class on Monday October 20, 2014, being sure that you have made a copy for safe keeping; OR

__2. Mail your completed exam to me with post mark October 20, 2014 to my address below.

Blackboard Learn ONLINE Section

__1. Upload your completed exam to the ASSIGNMENT tab no later than 11:59 pm on Monday October 20, 2014. This must be a single pdf and be named using the convention lastname_exam2B.pdf.

__2. Mail your completed exam to me with post mark October 20, 2014 to my address below.

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Tel. 413-545-1319
Signature

This is to confirm that in completing this exam, I worked independently and did not consult with anyone.

Signature: __________________________________________________________

Printed Name: ______________________________________________________

Date: ___________________________
1. (20 points total)

1a. (4 points)
In 1-2 sentences, what is the general goal of a study that implements sampling?

1b. (4 points)
List some advantages of probability sampling.

1c. (4 points)
In 1-2 sentences, explain sampling bias.

1d. (4 points)
Consider a study design in which consenting participants are randomized to either the “control” or “intervention” group. In 1-2 sentences, explain how the use of randomization has ensured comparability of the two groups.

1e. (4 points)
Telephone surveys may use a telephone directory to identify individuals for study. In 1-2 sentences, speculate on the type of household that would be under-covered by using this sampling frame.
2. (20 points total)

The following are excerpts from journal articles. In each, the authors describe the method of sampling that was used to obtain the analysis sample. For each, indicate whether the sample obtained is **unbiased** or **potentially biased**. If your answer is potentially biased, explain your reasoning.

2a. (4 points)
“An advertisement was placed in a university newspaper to recruit participants. The resulting sample consisted of 49 individuals: 30 females with a mean age of 24.4 years (SD=5.76) and 19 males with a mean age of 26.3 years (SD=7.61). Thirty eight were university students, whereas the other 11 subjects were employed”

2b. (4 points)
“Students enrolled in introductory psychology courses volunteered to participate in the research. There were 40 females and 40 males in the final sample. The participants ranged in age from 18 to 37 years, with an average age of 22 years. Only two of the participants were married.”

2c. (4 points)
“Participants were 247 seventh-grade students who studied in four junior high schools. Three classrooms (N=99) implemented IMPROVE [a math program with no ability tracking] and five homeroom classes (N=148) served as a non-treatment control group. Experimental classrooms were randomly selected from the entire pool (10 junior high schools) of seventh grade classes using IMPROVE, whereas the non-treatment control classes were randomly selected from a different district where students were tracked by ability.”
2. (20 points total) - continued

2d. (4 points)
“City directories were used to obtain a random sample of 300 residential addresses from each city. The scale [ie a questionnaire], a letter explaining the study, and a stamped self-addressed envelope were mailed to each of the 600 addresses. At the end of a 4-week period, 90 questionnaires, 78 useable, had been received from New Madrid (26%). Ninety two questionnaires, 84 useable, had been received from Garnett (28%)”

2e. (4 points)
“Questionnaires were mailed to all female students (n=236) and a random sample of male students (n=348) [enrolled in a college of engineering] who met the following criteria: (a) entered college directly from high school, (b) declared a major in engineering upon enrolling, (c) were enrolled in the university as 3rd, 4th, or 5th year students at the time of the study and (d) were American citizens or residents. The final sample comprised all 278 eligible participants who returned their questionnaires through the mail.”
3. (20 points total)

A researcher conducts a survey to learn about the sexual behavior of college students on a particular campus. A list of the undergraduates at the university is used to select participants. The investigator sends out 500 surveys but only 136 are returned.

3a. (10 points)
In 1-2 sentences, describe how the low response rate might have occurred and how it might have biased the results of the study.

3b. (10 points)
In 1-2 sentences, comment on the potential limitations in the quality of the survey response data that is obtained from this survey.
4. (20 points total)

Suppose you want to conduct a survey of nurses who work at a particular hospital. Of the 90 nurses who work at this hospital, 40 work in the maternity ward, 20 work in the oncology ward, and 30 work in the surgical ward. Suppose you want to study 10% of the nurse population. Suppose further that you decide to select your 10% = 9 nurses as follows: 4 nurses are chosen at random from the 40 who work in the maternity ward, 2 nurses are chosen at random from the 20 who work in the oncology ward, and 3 nurses are chosen at random from the 30 nurses who work in the surgical ward.

In 1–4 sentences, what kind of sampling design is this? Explain your response.
5. (20 points total)

An employer offers its employees a program that will provide up to four free psychological counseling sessions per calendar year. To evaluate satisfaction with this service, the counseling office mails questionnaires to every 10th employee who used the benefit in the prior year. There were 1000 employees who used the benefit. Therefore, 100 surveys were sent out. However, only 25 of the potential respondents completed and returned their questionnaire.

5a. (5 points)
What is the target population for this study?

5b. (5 points)
What method of sampling was used? Describe.

5c. (5 points)
In 1-2 sentences, what concerns are raised by the fact that only 25 of the 100 questionnaires were completed and returned?

5d. (5 points)
Now suppose that all 100 questionnaires were completed and returned. Would this represent a simple random sample?