1. (3 marks)

What is the preferred treatment for breast cancer that is detected in it's early stages? The most common treatment was once mastectomy. It is now usual to remove the tumor and nearby lymph nodes, followed by radiation. To study whether treatments differ in their effectiveness, a medical team examines records of 25 large hospitals and compares survival times after surgery of all women who have had either treatment.

- a) What are the explanatory and response variables?
- b) Explain carefully why this study is not an experiment.
- c) Do you think this study will show whether a mastectomy causes longer average survival time? Explain your answer carefully.

Answers:

- <u>Explanatory Variable</u>: Which surgery performed (mastectomy vs. tumor & lymph removal)
 <u>Response Variable</u>: Survival time.
- b) This study uses available data; it is not an experiment because the study itself imposes no treatment on the subjects.
- c) Any conclusion drawn from this study would be viewed with suspicion because doctors may recommend treatment based on the patient's conditions. Perhaps some doctors are more likely to suggest one treatment for more advanced cases; those patients would have a poorer prognosis that the patients for whom the doctors suggest the other treatment.

2. (1 mark)

The students listed are enrolled in a statistics course. Choose an SRS of 6 students to be interviewed in detail about the course.

Agarwal	Dewald	Hixson	Puri
Anderson	Fernandez	Klassen	Rodriguez
Baxter	Frank	Liang	Rubin
Bowman	Fuhrmann	Moser	Santiago
Bruvold	Goel	Naber	Shen
Casella	Gupta	Petrucelli	Shyr
Choi	Hicks	Pliego	Sundheim

Answers:

If numbered 00-27 then:

04- Bowman, 10-Frank, 17-Liang, 19-Naber, 12-Goel, 13-Gupta If numbered 01-28 then:

04-Brurold, 10-Fuhrmann, 17-Moser, 19-Petrocelli, 12-Gupta, 13-Hicks

Q 3 (1 mark)

You want to choose an SRS of 25 of a city's 440 voting precincts for special voting fraud surveillance. How would you label the 440 precincts? Choose the SRS and list the precincts you selected.

Answers

➤ Need to label from 000 to 439.

> The first five districts from line 117 are 381, 262, 183, 322, 341

4. (2 marks)

A club has 30 student members and 10 faculty. The students are:

Abel	Fisher	Huber	Moran	Reinmann
Carson	Golomb	Jimenez	Moskowitz	Santos
Chen	Griswold	Jones	Neyman	Shaw
David	Hein	Kiefer	Obrian	Thompson
Deming	Hernandez	Klotz	Pearl	Utts
Elashoff	Holland	Liu	Potter	Vlasic
And the fac	ulty member	s:		
Andrews	Fernandez	Kim	Moore	Rabinowitz
Bescovitch	Gupta	Lightman	Phillips	Yang

The club can send 4 students and 2 faculty members to a convention and decides to choose those who will go by random selection. Use Table B to choose a stratified random sample of 4 students, and 2 faculty members.

Answers:

Label students 00, ... ,24

Label faculty 0, ..., 9

Need to choose 2 separate SRS (one for the students and one for the faculty)