Key

**HW #2 - Statistical Reasoning**

**Sampling Methods** Name: Date: Class:

1. Let's assume that our population we want to study is North Cobb High School. Give a way to choose a sample of 20 students from the population of 3,000 students. Use each of the following sampling methods.

   - Simple Random Sampling: Pick 20 random #s from 1-3000
   - Stratified Random Sampling: Divide into 4 grades, randomly pick 5 from each
   - Systematic Sampling: Pick every 7th student who walks in until 20.
   - Cluster Sampling: Pick several 1st period classes - randomly pick from those.
   - Convenience Sampling: Ask 20 students in C Lunch

2. A university is conducting a survey to determine whether a public library has hours of business that satisfy most of its patrons. At the library, students question every tenth library patron who exits the library. What is the sampling method, how do you know?

   systematic

3. Suppose the students conduct the survey by asking all patrons checking out books to fill out a form and mail it back to the university. What is the sampling method, how do you know?

   Self selected (voluntary)

4. Suppose the university students question 20 library patrons chosen at random on a Monday morning between 9:00 am and 11:00 am. Is this method likely to result in a representative sample or a biased sample? Explain. Would it be biased? Why?

   Biased

5. The school board is trying to decide if the age of a student affects test achievement because they want to see what year the graduation test should be given. The testing coordinator separated the roster of high school students into freshmen, sophomores, juniors and seniors and then randomly selected 20 students from each group. Each student then took the same version of the Social Studies graduation test and their results were compared.
   a) What is the variable of interest? SS grad test
   b) What sampling method is being used and how do you know?

   stratified



6. The Georgia Tech wants to find out if its transportation services are adequately serving the students who live off campus. There are 10 apartment complexes that are on the University bus line. Each of these apartment complexes contains a diverse group of students. The researchers randomly select one of the apartment complexes and surveyed every student who lives there about their opinions on the transportation service. What method of sampling is this? How do you know?

   cluster

7. Dr. Shropshire thinks that the Future Shop is not being used to its full potential by the students at the school. He decides to do a study by asking students how much they have used the Future Shop this semester. He gets a list of student numbers from the front office and uses a random generator to choose 100 numbers off of the list. What type of sampling method is this? How do you know?

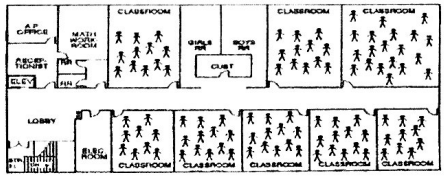
   simple random

8. What if Dr. Shropshire had taken that same list and selected every 15th student number? What type of sampling method would it be and how do you know?

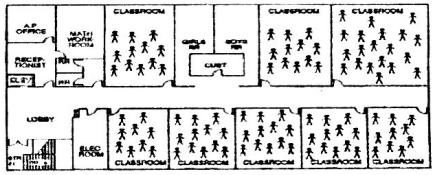
   systematic

**Create a visual representation of each of the following sampling method by circling the students.**

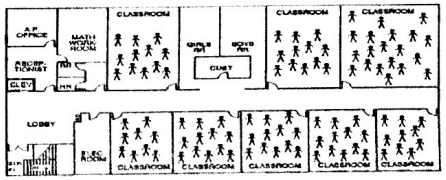
9. Simple Random sample:



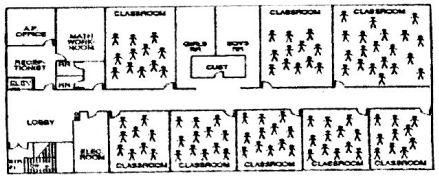
10. Stratified sample:



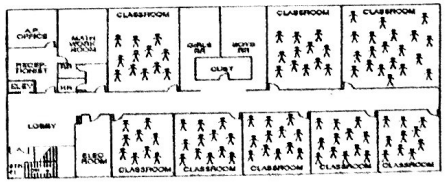
11. Systematic sample:



12. Cluster sample:



13. Convenience sample:



**Choose which sampling technique is used.**

**(R) Random (STR) Stratified (CLS) Cluster (CON) Convenience (SYS) Systematic**

STR 14. There are 250 seventh graders and 300 eighth graders at Generic Middle School. We ask 45 seventh graders and 50 eighth graders how many siblings they have to compare the two groups.

CLS 15. I ask all freshmen, no sophomores, no juniors, and all seniors if they prefer Vanilla or Cherry Coke (these fou groups are my only four groups) to create a study of what should be in the vending machines.

CON 16. I ask everyone in my 5th period class who has more than one computer at home in a study about all of my students for the year.

SYS 17. I collect data from every 15th student on my list of the entire school population.

R 18. After using a random number table to generate two-digit numbers, I decide on 10 people to choose from the population.

CON 19. The researcher selects participants based on easy accessibility.

STR 20. The researcher separates the population into a number of statistical subpopulations (groups) and then takes a random sample within each subpopulation (group).

SYS 21. The researcher separates the population into evenly sized groups, randomly selects on participant in the first group, and then selects every nth participant.

R 22. The researcher chooses the sample from the entire population through a randomization technique, such as drawing names out of a hat or using a random number generator.

CLS 23. The researcher separates the population into groups and then randomly selects some of these groups to participate. All people in each group selected will participate.

Census 24. Every person in the total population participates.



STR 25. There are 250 seventh graders and 300 eighth graders at Generic Middle School. We ask 45 seventh graders and 50 eighth graders how many siblings they have to compare the two groups.

CLS 26. I ask all freshmen, no sophomores, no juniors, and all seniors if they prefer Vanilla or Cherry Coke (these four groups are my only four groups) to create a study of what should be in the vending machines.

CON 27. I ask everyone in my 5th period class who has more than one computer at home in a study about all of my students for the year.

SYS 28. I collect data from every 15th student on my list of the entire school population.

R 29. After using a random number table to generate two-digit numbers, I decide on 10 people to choose from the population.

***Give an advantage and disadvantage of each of the following:***

**Census**

12. Advantage:

13. Disadvantage:

**Convenience Sampling**

14. Advantage:

15. Disadvantage: