JCC Statistics
Final Exam Review Ch 1 & 2

Name:
Date:

The final exam will be given on June 7, 8, and 9. ← make up day

1. Explain the differences between a sample and a population

   Population = all subjects in the group of subjects
   Sample = a subgroup of randomly selected subjects from the pop.

2. Why are samples used in statistics

   To save time & money

3. List the four components that comprise the definition of statistics

   a. Id. a research objective
   b. Collect needed data
   c. Describe the data (Descriptive stats)
   d. Make a decision about the research objective (Inferential stats)

4. Explain the differences between an observational study and a designed experiment.

   Can't Claim Causation * Obs. Study: a study in which no attempt is made to manipulate the explanatory or response variable
   Designed Exp: a study in which a treatment is applied to the explanatory variable to influence the response variable

5. Observation Study or Designed Experiment? A sports reporter asks 50 baseball fans if the ball from Barry Bonds's record setting 756th homerun should be marked with an asterisk when sent to the Baseball Hall of Fame. (* means the record was broken during baseball's "steroid era")

   Observational Study

   What is the response variable?

   Should Barry bonds 756th HR be marked with astrisk

   Yes or No

6. Observation Study or Designed Experiment? A sample of 40 laptop computers is selected and divided into two groups. One group uses a brand name battery and the other group uses a generic battery. All variables besides battery type are controlled. The battery life of each battery is recorded and the battery life of the two groups are compared.

Designed Exp

What is the response variable? Battery life

7. Compare and contrast observational studies and designed experiments. Which type allows a researcher to determine causality. Designed Exp.

8. List the steps required in a designed experiment and comment on the rational for using a placebo in your experiment.

See pg 47

9. Identify and define the procedures used for selecting a sample of size n from a given population.

① Simple Random ③ Systematic ⑤ convenience
② Stratified ④ Cluster

*Be sure that you can manipulate your calculator to generate simple random samples of any given size. (Use "**randInt(**" on your calculator)

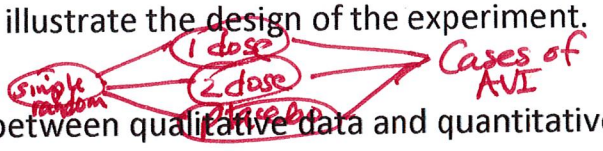
10. Acme Pharmaceuticals announced the results of its human trial of vaccine AVI500. A total of 300 patients diagnosed with AVI are divided into 3 groups as part of a double blind, placebo controlled study to test its effectiveness in preventing the disease AVI. The first group received a single dose of the vaccine. The second group received 2 doses of the vaccine 90 days apart and the third group received a placebo.
    a. What type of experimental design is this? Simple Random
    b. What is the response variable in this experiment ? # of cases of AVI
    c. What is the factor that is set to predetermined levels? ~~the vaccine dosage~~ 300 Patients have AVI

d. What are the treatments? Vaccine Dosage

e. What does it mean for this study to be double blind? Neither the subject nor researcher know who gets the vaccine

f. Identify the experimental units. Patients with AVI

g. Draw a diagram to illustrate the design of the experiment.



11. What is the difference between qualitative data and quantitative data? Provide examples of each.

Qualitative = based on characteristic

Quantitative = number based

12. What is the difference between discrete data and continuous data? Provide examples of each.

discrete = countable

continuous = measures

13. Explain the difference between a frequency distribution and a relative frequency distribution

% = relative frequency

14. Convert the frequency distribution below to a relative frequency distribution

Number of marks	Tally marks	Frequency
1	𝍸 II	7
2	𝍸	5
3	𝍸 I	6
4	𝍸	5
5	III	3
Total		26

Rel freq.

7/26 = .269

5/26 = .192

6/26 = .231

5/26 = .192

3/26 = .115

15. If the data in the frequency distribution above were to be presented as a pie chart, how many degrees would we use to represent the category of 1 mark?

(7/26) x 360° = 97°

16. Using Excel, construct a frequency bar graph and a pie chart of the data in #14.

17. Explain the differences between a frequency bar graph and a frequency histogram. Be sure to address when each should be used.

18. Given the stem and leaf plot below, Reconstruct the original data set.

Grades on a Science Test

Stem	Leaf
7	2 2 4 5 6 9
8	1 4 5 7 7 9
9	0 1 3 5 8
10	0 0

Key: 7 / 2 means 72 percent

72, 72, 74, 75, 76, 79
81 84 85 87 87 89
90 91 93 95 98
100 100

19. Under what circumstances is it best to use a time-series graph?

When an event is measured over a period of time

20. How would one turn a bar graph into a pareto chart?

Order bars high to Low