STA1013 : Practice Problems for Quiz 1

1. Indicate which of the following is a parameter

   A. A mean obtained from sampling 2,000 American adults using random digit dialing

   B. A mean obtained from sampling 10,000 teenagers on Facebook

   C. A Harris poll surveyed 2,320 adults in the United States, among which 14% said that they have at least one tattoo

   D. A mean obtained from the U.S. census

   1. _____

2. Determine whether the given value is a statistic or a parameter.

   (a) In a AAA Foundation for Traffic Safety survey, 21% of the respondents said that they recently texted or e-mailed while driving.

   (a) _____

   (b) There are 50 state capitols in the United States.

   (b) _____

   (c) A study was conducted of all 2,223 passengers aboard the Titanic when it sank.

   (c) _____

(d) In a random sample of households, it was found that 47% of the sampled households had high-definition TVs.

(d) _____

3. What is wrong with the given calculation.

(a) Political Parties In a preelection survey of likely voters, political parties of respondents are identified as 1 for a Democrat, 2 for a Republican, 3 for an Independent, and 4 for anything else. The average (mean) is calculated for 850 respondents and the result is 1.7.

(a) _____

(b) Blood lead levels are represented as 1 for low, 2 for medium, and 3 for high. The average (mean) of the 121 blood lead levels is 1.53.

(b) _____

(c) World Series Champs As of this writing, the New York Yankees were the last team to win the World Series, and the numbers of the starting lineup are 2, 18, 25, 13, 20, 55, 24, 33, and 53. The average (mean) of those numbers is 27.0.

(c) _____

4. Identify the variable (Categorical or Quantative)

(a) **Blood Groups.** The blood groups of A, B, AB, and O.

(a) _____

(b) **Multiple choice Test Questions.** The answers (a, b, c, d, e) to multiple choice test questions.

(b) _____

(c) **Flights.** The total numbers of flights by different airlines between San Francisco

and Atlanta in the past month.

(c) _____

(d) **Car Safety ratings.** Consumer Reports safety ratings of cars: 0 = unsafe up to 3 = safest.

(d) _____

(e) **Shoe Sizes.** The shoe sizes (such as 8 or $10\frac{1}{2}$) of test subjects

(e) _____

(f) **GPA.**The grade point averages of randomly selected college students.

(f) _____

(g) **Word counts.** Numbers of words spoken in a day by a sample of males.

(g) _____

(h) **White Blood cells.** The white blood cell counts of different people, consisting of the numbers of white blood cells per microliter of blood.

(h) _____

(i) **Product ratings.** Consumer Reports magazine lists ratings of "best buy," "recommended," or "not recommended" for each of several different computers.

(i) _____

(j) **Political Survey.** In a survey of voter preferences, the political parties of respondents are recorded as coded numbers 1, 2, 3, 4, or 5 (where 1 = Democrat, 2 = Republican, 3 = Liberal, 4 = Conservative, 5 = other).

(j) _____

(k) **Weights.** Weights of the cola in cans of Diet Coke.

(k) _____

(l) **Product ratings.** Consumer Reports magazine lists ratings of "best buy," "recommended," or "not recommended" for each of several different computers.

(l) _____

(m) **Survey responses.** The responses(yes, no, refuse to answer) from survey subjects when asked a question.

(m) _____

5. GE wants to know defective rate among all bulbs produced in 2018. 1,000,000 bulbs were produced in their plants (2018). The company might sample, say, 500 bulbs to estimate the proportion of defectives. 5 out of 500 bulbs tested are defective.

   (a) What is the population and parameter ?

   (a) _____

   (b) What is the sample and statistic ?

   (b) _____

6. Which of the following is an example of continuous variable?

   A. number of children

   B. amount of time it takes to assemble an IKEA bookcase

   C. total number of phone calls made in a week

   D. number of bathrooms in a house

   6. _____

7. Which of the following is an example of discrete variable?

   A. circumference of American women's wrists

   B. amount of time spent playing computer games

   C. total number of phone calls made in a week

D. length of elephant tusks

7. _____

8. Identify the followings as categorical (C) or quantitative (Q)

(a) The amount of air inside the balloons at a party.

(a) _____

(b) The ice-cream flavors favored by FSU students.

(b) _____

(c) The time it takes a student to finish an exam.

(c) _____

(d) The number of textbooks in each room at a dormitory.

(d) _____

(e) The current temperature inside the classrooms on campus.

(e) _____

(f) The maximum legal highway speed in major European cities.

(f) _____

(g) Client satisfaction survey responses (poor, average, good, or excellent)

(g) _____

(h) How much is your income ? _____ $

(h) _____

(i) How much is your income ? (Choose one)

A. Under $20,000

B. $20,000 – $49,999

C. $50,000 and over

(i) _____

9. Data Set includes depths (km) of the sources of earthquakes.

6.6	2.2	18.5	7.0	13.7	5.4	5.3	5.9	4.7	14.5
2.0	14.8	8.1	18.6	4.5	17.7	15.9	15.1	8.6	5.2
15.3	5.6	10.0	8.2	8.3	9.9	13.7	8.5	8.2	7.9
17.2	6.1	13.7	5.7	6.0	17.3	4.2	14.7	15.2	3.3
3.2	9.1	8.0	18.9	14.2	5.1	5.7	16.4	10.1	6.4

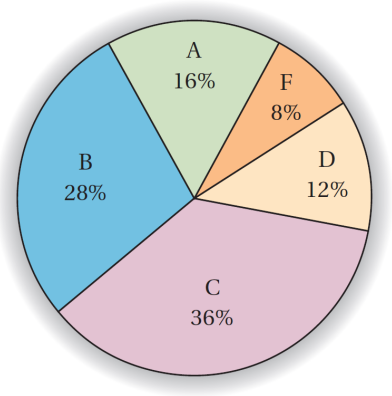
(a) Are these values discrete or continuous?

(a) _____

(b) If you construct a sample by selecting every sixth earthquake depth from the list given in Data Set, the result is a simple random sample. (True, False)

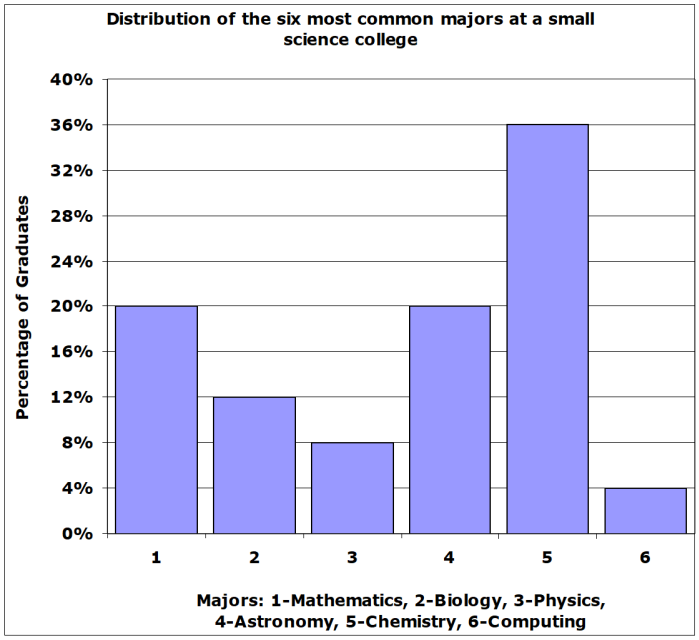
10. The numbers of the current players for the Chicago Bulls basketball team are 1, 2, 3, 5, 6, 9, 11, 13, 16, 20, 22, 26, 32, and 40. Does it make sense to calculate the average (mean) of these numbers? (Yes, No)

11. Use the pie chart to answer the following question. Suppose C has count 18 , What is the total number of subjects?, Reconstruct the Frequency table given below.



Grade	Count
A B C D F	18
Total	

12. Use the bar chart to answer the following questions.



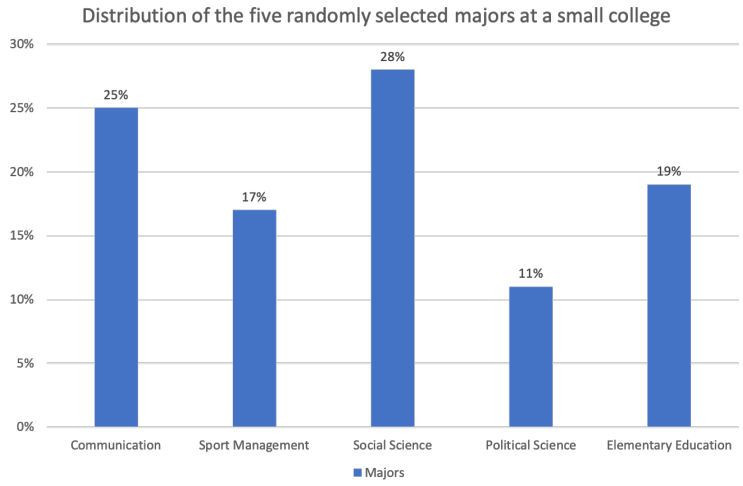
(a) If 54 students were Chemistry majors, what was the total number of students?

(a) _____

(b) How many students were Computing majors?

(b) _____

13. Use the bar chart given below to answer the following questions.



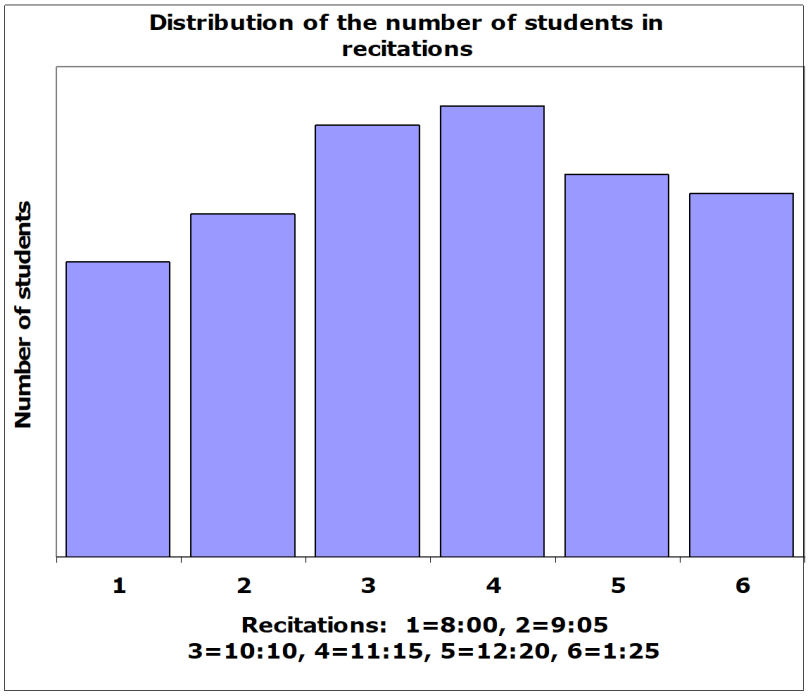
(a) If 110 students were Communication majors, what was the total number of students?

(a) _____

(b) How many students were Sport Management majors?

(b) _____

14. Use the bar chart given below to answer the following questions.



(a) The 10:10, 11:15 and 12:20 recitations together had more than half the students. (T , F)

(a) _____

(b) The difference between the number of students in the 10:10 and 11:15 recitations was less than the difference between the number of students in the 12:20 and 11:15 recitations. (T , F)

(b) _____

(c) The 10:10 recitation was less popular than the 12:20. (T , F)

(c) _____

(d) The 12:25 recitation had the most students. (T , F)

(d) _____

15. The below is the STA1013 Test Result. Use the table given below to answer the following questions.

28	45	50	61	62	72	73	75	80	81
82	88	89	93	94	95	96	98	100	100

(a) Create a Stem and Leaf plot (Set the tens digit as a stem, and the unit digit as a leaf)

Solution

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

(b) The shape of the distribution is

A. Bell-shaped B. Left-skewed C. Right-skewed D. Uniform

(b) _____

16. The split-stemplot below shows the customer service times (in minutes) at a supermarket chain. Remember that the first occurrence of a split stem carries leaves 0-4, the second occurrence carries leaves 5-9.

0	2	2	3	3	3	4	4	4								
0	5	5	6	6	6	6	7	7	7	8	8	8	8	9	9	
1	0	0	1	1	1	1	1	1	1	2	2	2	3	3	3	4	4
1	6	6	7	7	8	8	8	8	9	9							
2	1	2	3													
2	5	8														
3	1	1														
3	6															
4																
4	5															
5	2															

(a) The shape of the distribution is

A. bell-shaped B. left-skewed C. right-skewed D. uniform

(a) _____

(b) Roughly half the customers had to wait more than _____before being served. Choose the best answer to fill in the blank, that is, the answer that would make the statement closest to the truth.

A. 4 mins B. 2 mins C. 1 min

(b) _____

(c) Circle the words that would make true statements.

i. Most customers had to wait a (long / short) time and few had to wait a (long / short) time.

ii. There (are / are no) service times that are exceptionally short compared to the other service times.

iii. There (are / are no) service times that are exceptionally long compared to the other service times.

17. Which Study type is appopriate (Retrospective, Prospective, Cross-Sectional)

(a) **Drinking and Driving Study** : In order to study the seriousness of drinking and driving, a researcher obtains records from past car crashes. Drivers are partitioned into a group that had no alcohol consumption and another group that did have evidence of alcohol consumption at the time of the crash.

(a) _____

(b) **Meat and Mortality** : Researchers at the National Cancer Institute studied meat consumption and its relationship to mortality. Approximately one-half million people were surveyed, and they were then followed for a period of 10 years.

(b) _____

(c) **Smoking Study** : Researchers from the National Institutes of Health want to determine the current rates of smoking among adult males and adult females. They conduct a survey of 500 adults of each gender.

(c) _____

18. In a recent Gallup poll, pollsters randomly selected adults and asked them whether they smoke. Among the adults who responded to the survey question, 21% said that they did smoke.

    (a) Is that value of 21% an example of a statistic or an example of a parameter?

    (a) _____

    (b) Is that study an observational study or an experiment?

    (b) _____

19. In testing the **effectiveness of a new vaccine**, suppose that researchers used females for the treatment group and males for the control group. What is the confounding variable ?

    19. _____

20. You are conducting a survey of students in a co-ed dormitory in which males are assigned to odd-numbered rooms and females are assigned to even-numbered rooms.

    (a) You can obtain a representative sample when you choose every 6th room? (T, F)

    (b) Wchich sampling method is used in this example ?

        A. Simple random sample

        B. Systematic sample

C. Cluster sample

D. Stratified sample

(b) _____

21. Use the table to answer the following questions.

ind	1	2	3	4	5	6	7	8	9	10
Gender	M	F	M	F	M	F	M	F	M	F
Weight	195.6	165.6	200.4	165.3	191.7	169.3	189.5	153.2	170.4	149.3
ind	11	12	13	14	15	16	17	18	19	20
Gender	M	F	M	F	M	F	M	F	M	F
Weight	185.3	150.3	179.6	160.3	198.4	163.2	197.3	166.3	201.3	168.2

(a) We will draw sample from the below table. Which sampling method is better ?

A. Select 5 sample randomly

B. Start from 2 select every 4th observation

(a) _____

(b) Circle the words that would make true statements.

The sampling method (B.) in the above question will (Underestimate / Overestimate) the true parameter.

(c) Which sampling method is appropriate ?

A. Start from 1 select every 4th observation

B. Start from 2 select every 6th observation

C. Start from 3 select every 2nd observation

D. Start from 3 select evert 3rd observation

(c) _____

22. Identify which of these types of sampling is used: random, systematic, stratified, or cluster

(a) When collecting data from different sample locations in a lake, a researcher uses the "line transect method" by stretching a rope across the lake and collecting samples at every interval of 5 meters.

(a) _____

(b) The apple harvest from an orchard is collected in 1,200 baskets. An agricultural inspector randomly selects 25 baskets and then checks every apple in each of these baskets for worms.

(b) _____

(c) An educational researcher wants to know whether, at a particular college, men or women tend to ask more questions in class. Of the 10,000 students at the college, she interviews 50 randomly selected men and 50 randomly selected women.

(c) _____

(d) At a national conference of the American Appliances Association, a market researcher plans to conduct a survey of conference attendees. She uses the list of attendee names and selects every 20th name.

(d) _____

(e) In a Pew Research Center poll, 1007 adults were called after their telephone numbers were randomly generated by a computer, and 85% of the respondents were able to correctly identify what Twitter is.

(e) _____

(f) Exit Polls On the day of the last presidential election, ABC News organized an exit

poll in which specific polling stations were randomly selected and all voters were surveyed as they left the premises.

(f) _____

(g) Testing Lipitor In a clinical trial of the cholesterol drug Lipitor, subjects were partitioned into groups given a placebo or Lipitor doses of 10 mg, 20 mg, 40 mg, or 80 mg. The subjects were randomly assigned to the different treatment groups.

(g) _____

(h) Acupuncture Study In a study of treatments for back pain, 641 subjects were randomly assigned to the four different treatment groups of individualized acupuncture, standardized acupuncture, simulated acupuncture, and usual care.

(h) _____

(i) Bayer HealthCare LLC produces low-dose aspirin pills designed to contain 81 mg of aspirin. Because each pill contains other ingredients, including corn starch, talc, and propylene glycol, it is difficult to check whether manufactured pills contain 81 mg of aspirin. A quality control plan is to select every 1000th pill, which is then tested for the correct amount of aspirin.

(i) _____

(j) In order to test for a gender gap in the way that men and women purchase cars, the Grant Survey Company polls exactly 750 adult men and 750 adult women randomly selected from adults in the United States.

(j) _____

(k) In the last general election, 132,312 adults voted in Dutchess County, New York. You plan to conduct a post-election survey of 500 of those voters. After obtaining a list of those who voted, you number the list from 1 to 132,312, and then you use a computer to randomly generate 500 numbers between 1 and 132,312. Your sample consists of the voters corresponding to the selected numbers

(k) _____

23. Marijuana Survey Identify the type of sampling (random, systematic, convenience, stratified, cluster) used when a sample of the 1500 survey responses is obtained as described. Then determine whether the sampling scheme is likely to result in a sample that is representative of the population of all adults.

(a) A complete list of all 241,472,385 adults in the United States is compiled and every 150,000th name is selected until the sample size of 1500 is reached.

(a) _____

(b) A complete list of all 241,472,385 adults in the United States is compiled and 1500 adults are randomly selected from that list.

(b) _____

(c) The United States is partitioned into regions with 100 adults in each region. Then 15 of those regions are randomly selected, and all 100 people in each of those regions are surveyed.

(c) _____

(d) The United States is partitioned into 150 regions with approximately the same number of adults in each region, then 10 people are randomly selected from each of

the 150 regions.

(d) _____

24. Imagine that, for the 5,000 homes in its sample, **Nielsen chose only homes in which the primary wage earners worked a late-night shift**. Because late-night workers aren't home to watch late-night television, Nielsen would conclude late-night shows are unpopular among all Americans. Is the conclusion valid ? (Yes, No)

25. Determine whether the given description corresponds to an observational study or an experiment.

    (a) In a clinical trial of the cholesterol drug Lipitor, 188 subjects were given 20-mg doses of the drug, and 3.7% of them experienced nausea (based on data from Pfizer, Inc.).

    (a) _____

    (b) In a study sponsored by Coca-Cola, 12,500 people were asked what contributes most to their happiness, and 77% of the respondents said that it was their family or partner.

    (b) _____

26. Identify the independent variable and dependent variable in the following experiment. You want to see which type of fertilizer helps plants grow fastest, so you add a different brand of fertilizer to each plant and see how tall they grow.

    (a) Independent variable (Response variable) :

    (a) _____

    (b) Dependent variable (Explanatory variable) :

    (b) _____

27. Use the table given below to answer the question. We want to measure average weight of dogs. Which systematic sampling method is appropriate ? (G : Golden Rietriever, P : Poodle, M : Maltese)

ind	1	2	3	4	5	6	7	8	9	10	11	12
Breed	G	P	M	G	P	M	G	P	M	G	P	M
ind	13	14	15	16	17	18	19	20	21	22	23	24
Breed	G	P	M	G	P	M	G	P	M	G	P	M

A. Select from 3 every 3rd observation

B. Select from 2 every 3rd observation

C. Select from 1 every 6th observation

D. Select from 2 every 4th observation

27. _____