HW6 – Chapter 18 ***Name*** _____

The Rutgers Daily Targum polls a sample of 330 students randomly, finding 144 who say they will vote "yes" on the upcoming referendum on whether keep funding the paper . Create a 95% confidence interval for actual intentions of all students.

1. Random sampling condition. Were the students sampled randomly?
A. Yes B No. C. Most of the times D. Almost never

2. Is the 10% condition satisfied?
A. Yes, because 144 is more than 10% of the sample
B. Yes because there are more than 3300 students eligible to vote
C. No because 144 is more than 10% of the sample
D. Cannot be determined, because we don't know how many students will vote

3. What's the number of "successes" $n\hat{p}$?
A. 186 B. 330 C. 72 D. 144

4. What's the number of "failures" $n\hat{q}$?
A. 186 B. 330 C. 72 D. 144

5. Does the success/failure condition apply?
A. Yes, because there are more failures than successes
B. Yes, because there are more successes than failures
C. Yes, because both successes and failures are greater than 10
D. Yes, because the sum of successes and failures is greater than 10

6. What's the value of p?
A. 0.95 B. 0.436 C. 0.5 D. 0.624

7. What the values of $SE(\hat{p})$?
A. 0.034 B. 0.015 C. 0.027 D. 0.054

8. What's the margin of error?
A. 0.034 B. 0.015 C. 0.027 D. 0.054

9. What's the confidence interval?
A. (0.382, 0.490) B. (0.492, 0.563)C. (0.215, 0.364)D. (0.382, 0.590)

Chapter 19

A 2002 FEMA report claimed that at least 90% of all American households have at least one smoke detector installed. New York's fire department has been running a campaign to boost the percentage of homes that have a smoke detector installed. The city wants to know if this campaign has raised New York City level above the 90% national rate. Building inspectors visit 400 households selected at random and find smoke detectors in 376 of them. Is this strong evidence that New York City rate is higher than the national rate?

10.What is the null hypothesis in words?
A. The city has a worse rate than the national rate.
B. The city has a better rate than the national rate.
C. The city is no different from anywhere else.
D. There is no way to know the real population rate.

11.What is the alternative hypothesis in words?
A. The city has a worse rate than the national rate.
B. The city has a better rate than the national rate.
C. The city is no different from anywhere else.
D. There is no way to know the real population rate.

12.How can we express the two hypotheses in mathematical terms?

A. H_0: $p = 0.90$, H_A: $p < 0.90$
B. H_0: $p > 0.90$, H_A: $p = 0.90$
C. H_0: $p < 0.90$, H_A: $p > 0.90$
D. H_0: $p = 0.90$, H_A: $p > 0.90$

13.How many successes do we expect?

A. 40 B. 90 C. 360 D. 400

14.How many failures do we expect?

A. 40 B. 90 C. 360 D. 400

15.Do the random sampling condition, the 10% condition and the success/failure condition apply?
A.Only the first one
B. All three of them
C. Only the last two
D. Only the last one

16.Which kind of model do I need to use?
A. A geometric model
B. A normal model and a one-proportion z-test
C. A binomial model
D. A normal model and a t-test for the mean

17.What's the New York City rate, $\hat{p}$?

A. 0.94 B. 0.40 C. 0.75 D. 0.90

18.What's the z score?

A. – 1.04 B. 0.52 C. 1.87 D**.** 2.67

19.What's the P-value?

A. 0.0095 B. 0.004 C. 0.015 D. 0.007

20.What's the meaning of the P-value?
A. The city rate is higher than the national rate by only a small percentage
B. There is a very small probability that the difference observed is due to the sampling error.
C. The difference is so small to be significant
D. The P-value is too small to be meaningful

Chapter 20

A soda machine at your workplace dispenses soda into paper cups. You should get 10 ounces of soda, but the amount may vary slightly from serving to serving. You measure the amount of soda in a random sample of 20 servings and you find that the mean of your sample is 9.845 ounces, with a standard deviation of 0.199. Is the difference due to random fluctuation, or is the machine giving less soda than it should be?

21.What is the null hypothesis in words?
A. The mean amount of soda is 10 ounces
B. The mean amount of soda is greater than 10 ounces
C. The mean amount of soda is smaller than 10 ounces
D. The mean amount of soda is impossible to determine

22.What is the alternative hypothesis in words?
A. The mean amount of soda is 10 ounces
B. The mean amount of soda is greater than 10 ounces
C. The mean amount of soda is smaller than 10 ounces
D. The mean amount of soda is impossible to determine

23.How can we express the two hypotheses in mathematical terms?

A. H_0: m = 10.0, H_A: m < 10.0
B. H_0: m > 10.0, H_A: m = 10.0
C. H_0: m < 10.0, H_A: m > 10.0
D. H_0: m = 10.0, H_A: m > 10.0

24.Do the random sampling condition, the 10% condition and the independence condition apply?

A.Only the first one
B. All three of them
C. Only the last two
D. Only the last one

25.Which kind of model do I need to use?

A. A geometric model
B. A normal model and a one-proportion z-test
C. A binomial model
D. A normal model and a t-test for the mean

26.What's the t statistics ?

A. -2.23 B. 1.59 C. –3.49 D. 2.48

27.What's the P-value?

A. 0.0012 B**.** 0.006 C. 0.022 D. 0.0003

28.What's the meaning of the P-value?

A. The city rate is higher than the national rate by only a small percentage
B. The P-value is too small to be meaningful
C. The difference is so small to be significant
D. It is unlikely that the low sample value derives from sampling error

Chapter 21

The Palmolive management is concerned that only 19.5% of the people who use toothpaste buy Colgate toothpaste. A manager suggests that the company starts a new ad campaign, which will include TV ads and new labels and packaging for the toothpaste. To determine if the market share increases with new labels and packaging, the product department conducts trials of the new product in test markets for one month

29.What's the company's null and alternative hypotheses in mathematical terms?

A. H_0: $p = 0.195$, H_A: $p < 0.195$

B. H_0: $p > 0.195$, H_A: $p = 0.195$

C. H_0: $p < 0.195$, H_A: $p > 0.195$

D. H_0: $p = 0.195$, H_A: $p > 0.195$

30.In this context what's a Type I error?

A.concluding that the proportion of people that buy Colgate will go up when in effect it won't.

B. concluding that the proportion of people that buy Colgate will stay the same when in effect it won't.

31.In this context what's a Type II error?

A.concluding that the proportion of people that buy Colgate will go up when in effect it won't.

B. concluding that the proportion of people that buy Colgate will stay the same when in effect it won't.

32. The product department, after studying the results of the trial, found that a 98% confidence interval for the proportion of all consumers who might buy Colgate toothpaste was (16%, 28%). What conclusion should be reached about the new ad campaign?

A.the confidence interval contains the current value of 19.5, that means it is correct

B.the confidence interval contains the current value of 19.5, that means there is no evidence the campaign increased the percentage of costumers

C. The confidence interval is too wide to be effective

33.What level of significance did the product department use?

A. 5% B. 1% C 2.5% D. 2%

34.The board of directors asked the product department to extend the trial period to two months so that more data can be collected. Will the power increase, decrease, or remain the same?

A. increase B. decrease C. remain the same D. cannot be determined