Test 5 SHORT ANSWER QUESTIONS

1. Which is always possible, an experiment or an observational study?
2. If done correctly, which controls lurking variables, an experiment or an observational study?
3. The investigators control which subjects get what treatments in which one, an experiment or an observational study?
4. Give an example in which an experiment changed the conclusions of an observational study.
5. Were the observational studies wrong that said women at menopause that had hormone replacement therapy had fewer heart attacks?
6. What was the lurking variable that in observational studies made it appear that hormone replace at menopause made women have fewer heart attacks?
7. Give a lurking variable other than wealth or smoking that may explain why it appear that drinking wine appears to be better than beer or hard liquor in observational studies.
8. Give a lurking variable other than wealth or diet that may explain why it appear that drinking wine appears to be better than beer or hard liquor in observational studies.
9. Give a lurking variable other than diet or smoking that may explain why it appear that drinking wine appears to be better than beer or hard liquor in observational studies.
10. How could it be proven that wine is better than beer or hard liquor when it comes to health?
11. Suppose a large florist is deciding whether or not to accept a shipment of roses. The florist asks a recently hired employee to go into the truck where the shipment is and get a sample of 10 roses. What do you think this employee will do?
12. Suppose a large florist is deciding whether or not to accept a shipment of roses. The florist asks a recently hired employee to go into the truck where the shipment is and get a sample of 10 roses. There is a good chance the employee will pick 10 nice roses. Would you be surprised if after accepting the shipment the florist is not happy with the overall quality of the roses?
13. Give a bias with Mall Sampling other than against tuff looking individuals and in favor or teenagers.
14. Give a bias with Mall Sampling other than against tuff looking individuals and in favor or retired people.
15. Give a bias with Mall Sampling other than in favor of retired people and in favor or teenagers.
16. True or false: Getting a good sample is usually pretty easy to do.
17. The reasons people get bad samples is because of ignorance and \_\_\_\_\_\_\_\_\_.
18. The reasons people get bad samples is because of agenda and \_\_\_\_\_\_\_\_\_.
19. Are volunteer response samples good?
20. Give an example of a volunteer response sample.
21. The AFA (American Family Association) has online polls. Usually these polls will have what kind of bias?
22. The AFA (American Family Association) got upset when an online poll about same sex marriage showed 2-1 in support of it. What happened?
23. The ultimate way to sample is to get a what kind of sample?
24. How often are SRS’s possible?
25. Is it hard to get a bad sample?
26. Is it hard to get a good sample?
27. Give an example of undercoverage.
28. Give an example of nonresponse.
29. What is the problem with undercoverage and nonresponse?
30. Suppose a large city is deciding whether or not to use tax money to build a new stadium for its NFL football team. A newspaper is curious what the residents think and so they send out a mail questionnaire (that instantly makes it clear the NFL team is affected, but it’s not clear until you read closer that tax money is involved) to 10,000 addresses picked at random. Do you think all 10,000 questionnaires will be returned?
31. Suppose a large city is deciding whether or not to use tax money to build a new stadium for its NFL football team. A newspaper is curious what the residents think and so they send out a mail questionnaire (that instantly makes it clear the NFL team is affected, but it’s not clear until you read closer that tax money is involved) to 10,000 addresses picked at random. Do you think that even half will be returned?
32. Suppose a large city is deciding whether or not to use tax money to build a new stadium for its NFL football team. A newspaper is curious what the residents think and so they send out a mail questionnaire (that instantly makes it clear the NFL team is affected, but it’s not clear until you read closer that tax money is involved) to 10,000 addresses picked at random. Do you think people that would like a new stadium and those that do not will have the same rate of mailing the questionnaires back?
33. Suppose a large city is deciding whether or not to use tax money to build a new stadium for its NFL football team. A newspaper is curious what the residents think and so they send out a mail questionnaire (that instantly makes it clear the NFL team is affected, but it’s not clear until you read closer that tax money is involved) to 10,000 addresses picked at random. What sort of bias do you think will result if the newspaper relies only on the returned questionnaires?
34. Suppose a large city is deciding whether or not to use tax money to build a new stadium for its NFL football team. A newspaper is curious what the residents think and so they send out a mail questionnaire (that instantly makes it clear the NFL team is affected, but it’s not clear until you read closer that tax money is involved) to 10,000 addresses picked at random. Should they put a story in their paper telling the residents what they think about the potential new stadium?
35. Does the wording of a question have much effect on the answers?
36. Give an example in which the wording of a question could make quite a difference.
37. Give an example of how a sensitive question might not give accurate results.
38. Give an example of a question in which people are forgetful and the results may not be accurate.
39. Give an example of a question asked by the wrong person that would make the results worthless.
40. Give an example of a question that begs a certain answer and hence the results can’t be trusted.
41. We wish to perform an experiment to see whether an online version of a Stat course is better than an in class version. We have data from two teachers. Teacher A teaches an online class and the average grade point for the students in this class is 2.94. Teacher B teaches a regular class and the average grade point in this class was 2.33. So we conclude the online version is better. Three distinct problems are luck, Teacher A might be easier, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
42. We wish to perform an experiment to see whether an online version of a Stat course is better than an in class version. We have data from two teachers. Teacher A teaches an online class and the average grade point for the students in this class is 2.94. Teacher B teaches a regular class and the average grade point in this class was 2.33. So we conclude the online version is better. Three distinct problems are luck, better students might be more likely to take the online class, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
43. We wish to perform an experiment to see whether an online version of a Stat course is better than an in class version. We have data from two teachers. Teacher A teaches an online class and the average grade point for the students in this class is 2.94. Teacher B teaches a regular class and the average grade point in this class was 2.33. So we conclude the online version is better. Three distinct problems are better students might be more likely to take the online class, Teacher A might be easier, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
44. What is a control group?
45. The three principals of experimental design are to divide subjects at random, use a control group, and \_\_\_\_\_\_\_\_\_\_\_\_
46. The three principals of experimental design are to divide subjects at random, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and use a lot of subjects.
47. The three principals of experimental design are \_\_\_\_\_\_\_\_\_\_\_\_\_\_, use a control group, and use a lot of subjects
48. What does statistically significant mean?
49. What is a placebo?
50. What is the purpose of a placebo?
51. What is a double-blind experiment?
52. What is the purpose of a double-blind experiment?
53. Statistically significant depends on difference and \_\_\_\_\_\_\_\_\_.
54. Statistically significant depends on sample size and \_\_\_\_\_\_\_\_\_.
55. Give an example of how lack of realism can cause problems in an experiment.
56. In a matched-pairs experiment if each person gets both treatments, why is it still important to divide the people up at random?
57. Two advantages of a block design are to make luck less likely to affect things and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
58. Two advantages of a block design are to see what does better in each subgroup and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
59. Are the conditions usually met exactly when doing CIs or HTs?
60. Is it rare to see any problems when doing CIs or HTs?
61. If you have an outlier that is found to be a real piece of data, should you remove it?
62. To be a good statistician what should you do about not meeting conditions once the data is collected?
63. If you have an outlier that is found to be an incorrect piece of data and can’t be corrected, the best thing to do is what?
64. Do CIs and HTs remedy basic flaws in the data?
65. Give an example where a SRS is called for and not met, but probably does not cause any bad problems.
66. Give an example where a SRS is called for and not met, and this causes the results to be useless.
67. Give an example where there was a high statistical significance of something occurring, but it was not what people thought at first.
68. In the gastric freezing example, we were pretty sure patients were getting better, at first doctors thought it was \_\_\_\_\_\_\_\_\_\_\_\_\_\_ , but later experiments showed it was probably just because of placebo affect? The problem was at first the gastric freezing experiment was not controlled.
69. In the gastric freezing example, we were pretty sure patients were getting better, at first doctors thought it was gastric freezing, but later experiments showed it was probably just because of the\_\_\_\_\_\_\_\_\_ affect? The problem was at first the gastric freezing experiment was not controlled.
70. In the gastric freezing example, we were pretty sure patients were getting better, at first doctors thought it was gastric freezing, but later experiments showed it was probably just because of the placebo affect? The problem was at first the gastric freezing experiment was not \_\_\_\_\_\_\_\_\_.
71. Do outliers have much effect on the HTs and CIs we do in the class?
72. Does the margin of error in a CI fix nonresponse?
73. Does the margin of error in a CI fix undercoverage?
74. Does the margin of error in a CI fix biased data?
75. If your sample is not a random sample, can you be 95% sure that the CI has the correct answer for the parameter?
76. There is only one thing the margin of error in a CI covers, what it that?
77. What does the *p*-value mean in cases where the sample you use for the HT has problems with it?
78. \_\_\_\_\_\_\_\_\_\_\_\_, how hard it would be to believe the result, and the consequences are three things that affect how small we would desire the *p*-value or the significance level to be.
79. How important it is to get it right, \_\_\_\_\_\_\_\_\_\_\_\_, and the consequences are three things that affect how small we would desire the *p*-value or the significance level to be.
80. How important it is to get it right, how hard it would be to believe the result, and \_\_\_\_\_\_\_\_\_\_\_\_ are three things that affect how small we would desire the *p*-value or the significance level to be.
81. Should we always use the 5% significance level?
82. If you have a small sample size, what will happen to the *p*-value if the same behavior is seen with a larger sample?
83. If you have a small sample size and the *p*-value is too high, should you just give up on rejecting Ho?
84. Does practically significant mean the same as statistically significant?
85. A small difference that nobody would care about in the real world, but we are really sure about is \_\_\_\_\_\_\_\_\_\_\_\_\_ significant, but not practically significant?
86. A small difference that nobody would care about in the real world, but we are really sure about is statistically significant, but not \_\_\_\_\_\_\_\_\_\_\_\_\_ significant?
87. When doing HTs is it best to first look at the data you collect before deciding on Ho and Ha?
88. Is it a good idea to do many different HTs to search for things that are true?
89. Why is it not a good idea to do many different HTs to search for things that are true?
90. Is it a good idea to do repeat the same HTs with different sets of data?
91. Why is it a good idea to repeat the same HTs with different sets of data?
92. How often we will be able to exactly meet the condition for CIs and HTs to be mathematically precise?
93. Generally speaking there are there more concern with doing HTs and CIs with small sample sizes or large sample sizes?
94. Name one problem with doing HTs and CIs with large sample sizes.
95. If your degrees of freedom are not in the table what should you do?
96. If you reject an Ho assuming fewer degrees of freedom than you actually have, will you be able to reject Ho with the correct degrees of freedom?
97. If you reject an Ho assuming more degrees of freedom than you actually have, will you be able to reject Ho with the correct degrees of freedom?
98. If you give a 95% CI assuming fewer degrees of freedom than you actually have, you should be \_\_\_\_\_\_\_\_\_\_\_\_ than 95% sure you have the correct answer in the CI?
99. Suppose you assumeand  and *n* = 16 and and you are trying to prove . Would it be better or worse if *s =* 9?
100. Suppose you assumeand  and *n* = 16 and and you are trying to prove . Would it be better of worse if *n =* 17?
101. Suppose you assumeand  and *n* = 16 and and you are trying to prove . Would it be better or worse if ?
102. You are comparing two means and your sample sizes are 5 and 8. The samples are random. There are no outliers but the shapes of the sample data are quite different. Do you think it is OK to do HT or CI?
103. You are comparing two means and your sample sizes are 50 and 80. The samples are random. There are no outliers but the shapes of the sample data are quite different. Do you think it is OK to do HT or CI?
104. You are comparing two means and your sample sizes are 5 and 8. The samples are random. There are no outliers and the shapes of the sample data are very close. Do you think it is OK to do HT or CI?
105. You are comparing two means and your sample sizes are 50 and 80. The samples are random. There are no outliers and the shapes of the sample data are very close. Do you think it is OK to do HT or CI?
106. You are comparing two means and your sample sizes are 5 and 8. The samples are random. There are two minor outliers and the shapes of the sample data are very close. Do you think it is OK to do HT or CI?
107. You are comparing two means and your sample sizes are 50 and 80. The samples are random. There are two minor outliers and the shapes of the sample data are very close. Do you think it is OK to do HT or CI?
108. You are comparing two means and your sample sizes are 5 and 8. The samples are random. There are two minor outliers and the shapes of the sample data are quite different. Do you think it is OK to do HT or CI?
109. You are comparing two means and your sample sizes are 50 and 80. The samples are random. There are two minor outliers and the shapes of the sample data are quite different. Do you think it is OK to do HT or CI?
110. You are studying a mean and have a sample of size 10. The sample data is symmetric with no outliers and the data was collected at random. Do you think it is OK to do HT or CI?
111. You are studying a mean and have a sample of size 10. The sample data is not symmetric and there are no outliers and the data was collected at random. Do you think it is OK to do HT or CI?
112. You are studying a mean and have a sample of size 10. The sample data is symmetric with a minor outlier and the data was collected at random. Do you think it is OK to do HT or CI?
113. You are studying a mean and have a sample of size 100. The sample data is symmetric with no outliers and the data was collected at random. Do you think it is OK to do HT or CI?
114. You are studying a mean and have a sample of size 100. The sample data is not symmetric with no outliers and the data was collected at random. Do you think it is OK to do HT or CI?
115. You are studying a mean and have a sample of size 100. The sample data is symmetric with a minor outlier and the data was collected at random. Do you think it is OK to do HT or CI?
116. You are studying the mean heights of all adult men and have a sample of size 1200. The sample data is all major league baseball players and it is symmetric with no outliers. Do you think it is OK to do HT or CI?
117. You are studying the mean number of gallons of milk sold per day by a store and your sample is 60 days all in a row. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
118. You are studying the mean number of gallons of milk sold per day by a store and your sample is 30 days starting with one day and picking every 7th day after that. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
119. You are studying the mean number of gallons of milk sold per day by a store and your sample is 30 days starting with one day and picking every 12th day after that. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
120. You are studying the mean drying time of paint on 2x4’s sold by a home improvement store and your sample is 40 boards all from the same shipment and the wood is pretty much the same from shipment to shipment. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
121. You are studying the mean drying time of paint on 2x4’s sold by a home improvement store and your sample is 40 boards all from the same shipment and the wood tends to vary quite a bit from shipment to shipment. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
122. You are studying the mean drying time of paint on 2x4’s sold by a home improvement store and your sample is 40 boards in which you choose 10 shipments spaced out over several months and then chose 4 boards from each at shipment (one off the top, two from the middle, and one off the bottom). It’s not a SRS, but do you think it would still be OK to do a HT or CI?
123. You are studying the mean drying time of paint on 2x4’s sold by a home improvement store and your sample is 240 boards all from the same shipment and the wood tends to vary quite a bit from shipment to shipment. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
124. You are studying the percents of cats that prefer two different types of cat food and your sample is 42 cats that were basically all the cats of all the people you know well that would participate. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
125. You are studying the percents of people that prefer two different types of beer and your sample is 42 prisoners in county jail. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
126. You are studying the difference in average weights of boy 4th graders and girl 4th graders and your samples are all 52 4th grade boys from a school in Mississippi and all 32 4th grade girls from a school in Colorado. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
127. You are studying the difference in average weights of boy 4th graders and girl 4th graders and your samples are all 52 4th grade boys from a school in Mississippi and all 32 4th grade girls from the same school. It’s not a SRS, but do you think it would still be OK to do a HT or CI?
128. For HTs and CIs for comparing means from two independent samples with small sample sizes, you want the samples to have similar \_\_\_\_\_\_\_\_\_\_ with no outliers.
129. For HTs and CIs for comparing means from two independent samples with small sample sizes, you want the samples to have similar shapes with no \_\_\_\_\_\_\_\_\_\_.
130. How can you get a good idea about the shape of a distribution?
131. How can you get a good idea if there are outliers?
132. When subtracting means from two independent samples {X and Y}of size  and with sample variances and  the best guess for the standard deviation for sample means from X is \_\_\_\_\_\_\_\_\_\_\_
133. When subtracting means from two independent samples {X and Y}of size  and with sample variances and  the best guess for the standard deviation for sample means from X is , the best guess for the variance for the sample means from X is \_\_\_\_\_\_\_\_\_\_.
134. When subtracting means from two independent samples {X and Y}of size  and with sample variances and  the best guess for the standard deviation for sample means from X is , the best guess for the variance for the sample means from X is , the best guess for the variance of the difference of the means from X and Y is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
135. When subtracting means from two independent samples {X and Y}of size  and with sample variances and  , the best guess for the variance of the difference of the means from X and Y is , the best guess for the standard deviation of the difference of the means from X and Y is \_\_\_\_\_\_\_\_\_\_\_\_\_.
136. Suppose andand and and and  and X and Y are normal, we are looking at the distribution of . What will be its shape?
137. Suppose andand and and and  and X and Y are normal, we are looking at the distribution of . What will be its mean?
138. Suppose andand and and and  and X and Y are normal, we are looking at the distribution of . What will be its standard deviation?
139. How do you go from how many successes (Binomial) to proportion of successes?
140. If you divide the number of successes by *n*, the mean gets divided by \_\_\_\_
141. If you divide the number of successes by *n,* the variance gets divided by \_\_\_\_\_\_
142. The mean of the binomial is *np* which divided by *n* is \_\_\_\_\_\_, which is the mean of *p’.*
143. The variance of the binomial is *npq* which divided by  is \_\_\_\_\_\_\_.
144. The variance of the binomial is *npq* which divided by  is  , so the standard deviation of *p’* is \_\_\_\_\_\_\_\_\_\_.
145. If a population is normal, then dividing by *n* will give it what shape?
146. The binomial is approximately normal when *np* and *nq* exceed ­­­­\_\_\_\_\_\_\_ so *p’* is also approximately normal under the same conditions.
147. For a HT for *p* we use , because we assume Ho is \_\_\_\_\_ and so have a value for *p*.
148. For a CI for *p* we use  because we estimate *p* by \_\_\_ and *q* by q’.
149. For a CI for *p* we use  because we estimate *p* by p’ and *q* by \_\_\_\_\_.
150. When subtracting proportions from two independent samples {X with sample size and proportion  and Y with sample size and proportion } the standard deviations from X and Y are \_\_\_\_\_\_\_ and 
151. When subtracting proportions from two independent samples {X with sample size and proportion  and Y with sample size and proportion } the standard deviations from X and Y are  and \_\_\_\_\_\_.
152. When subtracting proportions from two independent samples {X with sample size and proportion  and Y with sample size and proportion } the standard deviations from X and Y are  and , the variances are \_\_\_\_\_\_ and .
153. When subtracting proportions from two independent samples {X with sample size and proportion  and Y with sample size and proportion } the standard deviations from X and Y are  and , the variances are  and \_\_\_\_\_\_\_\_\_\_.
154. When subtracting proportions from two independent samples {X with sample size and proportion  and Y with sample size and proportion } the variances from X and Y are , the variances are and , when subtracting the variance is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
155. When subtracting proportions from two independent samples {X with sample size and proportion  and Y with sample size and proportion } when subtracting the variance is  and the standard deviation is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
156. The formula for the standard deviation of the difference of two proportions is . If we must estimate the *p’s* with sample numbers without the assumption that the *p’s* are equal then the formula becomes what?
157. The formula for the standard deviation of the difference of two proportions is . If we estimate the *p’s* with sample numbers with the assumption that the *p’s* are equal then the formula becomes what?
158. Suppose  and and and , what will be the mean of ?
159. Suppose  and and and , what will be the standard deviation of ?
160. Suppose  and and and , what will be the approximate shape of ?
161. With a Test for Independence why are the Es = (row total)(column total)/(grand total)? For E that is for Row 2 and Column 3, E should be (grand total)(P(\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)) = *n*(P(R2) P(C3)) because we assume that Ho is true which is that the rows and columns are independent. The best estimate for P(R2) = (R2 total)/n and for P(C3) = (C3 total/n) making the estimate (R2 total)(C3 total)/*n.*
162. With a Test for Independence why are the Es = (row total)(column total)/(grand total)? For E that is for Row 2 and Column 3, E should be (grand total)(P(R2 & C3)) = *n*(P(\_\_\_\_\_) P(C3)) because we assume that Ho is true which is that the rows and columns are independent. The best estimate for P(R2) = (R2 total)/n and for P(C3) = (C3 total/n) making the estimate (R2 total)(C3 total)/*n.*
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165. With a Test for Independence why are the Es = (row total)(column total)/(grand total)? For E that is for Row 2 and Column 3, E should be (grand total)(P(P(R2 & C3)) = *n*(P(R2) P(C3)) because we assume that Ho is true which is that the rows and columns are independent. The best estimate for P(R2) = \_\_\_\_\_\_\_\_\_\_ and for P(C3) = (C3 total/n) making the estimate (R2 total)(C3 total)/*n.*
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167. Suppose you have three normal populations with equal variances and you find , , , , , and . Would you have better evidence for a difference in population means if  instead?
168. Suppose you have three normal populations with equal variances and you find , , , , , and . Would you have better evidence for a difference in population means if  instead?
169. Suppose you have three normal populations with equal variances and you find , , , , , and . Would you have better evidence for a difference in population means if  instead?
170. Suppose you have three normal populations with equal variances and you find , , , , , and . Would you have better evidence for a difference in population means if  instead?
171. Can you still do all the calculations for CIs and HTs if the data is bad?
172. Should you do all the calculations for CIs and HTs if the data is bad?
173. Two advantages of Non-parametric statistics are that they tend to be less assumptions and \_\_\_\_\_\_\_\_\_\_\_\_.
174. Two advantages of Non-parametric statistics are that they tend to be easy to apply and \_\_\_\_\_\_\_\_\_\_\_\_.
175. Give a disadvantage of Non-parametric statistics.
176. If you want to do a HT about the mean but the sample size is small and there is an outlier, you might instead do a HT about the \_\_\_\_\_\_\_\_\_\_ and use the nonparametric test called the Sign Test.
177. If you want to do a HT about the mean but the sample size is small and there is an outlier, you might instead do a HT about the median and use the nonparametric test called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
178. With a Test for Independence why are the Es = (row total)(column total)/(grand total)? For E that is for Row 2 and Column 3, E should be (grand total)(P(P(R2 & C3)) = *n*(P(R2) P(C3)) because we assume that Ho is true which is that the rows and columns are independent. The best estimate for P(R2) = (R2 total)/n and for P(C3) = (C3 total)/n making the estimate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.