Exam 1 Practice

Questions 1-4 are based on the following description

A team of researchers wished to study whether oatmeal reduced bad cholesterol levels in those who ate it. They found 500 adults over age 40 who regularly eat oatmeal or products from oatmeal. They then matched each of these 500 with a similar adult (one of the same gender, within 10 pounds of the same weight, and who exercised roughly the same amount) who did not regularly eat oatmeal or products made from oatmeal. Finally, they measured the bad cholesterol LDL for each adult and compared both groups.

1) This is NOT an **experiment** because:

A) It did not use a random sample of subjects
B) It used matched pairs
C) It was not at least single-blind
D) The researcher did not assign the adults to regularly eat oatmeal or not
E) The researcher did not use a random sample

2) The **individuals** in this observational study were:

A) The 500 non-oatmeal eaters
B) The 500 who regularly ate oatmeal
C) The combined 500 oatmeal eaters and 500 non-oatmeal eaters
D) The researchers
E) Eating oatmeal and not eating oat-meal

3) The **matching** was good because it:

A) Avoided undercoverage
B) Helped reduce the number of processing errors
C) Increased the variability of the estimated difference due to oatmeal
D) Removed confounding with gender, weight, and exercise
E) Removed the placebo effect

4) This study can't give evidence that oatmeal causes a decrease in LDL levels of those in our sample because:

A) It did not use a random sample of subjects
B) It used matched pairs.
C) The researcher did not assign the adults to regularly eat oatmeal or not
D) The researcher did not use a random sample
E) The sample size wasn't large enough

Questions 5-14 are based on the following description

A recent poll in Indiana was conducted to see what percentage of all likely voters for the state's upcoming presidential primary election would favor moving the primary from May to January. A sample of size 800 was chosen by using the list of all living voters who had voted in at least two of the last three presidential primary elections. The sample was chosen by numbering everyone who was on the list and then selecting 800 of those numbers at random using a computer program like we saw in class. 488 of the 800 contacted by phone favored moving the Indiana primary from May to January, and 312 were not in favor of moving the primary.

5) This is an example of a:

A) Cluster Sample
B) Multistage Sample
C) Simple Random Sample
D) Stratified Random Sample
E) Systematic Sample

6) The **sampling frame** in this example is:

A) Likely primary election voters in the state
B) The 488 people who answer that they would favor moving the primary
C) The 800 people who responded to the survey
D) The computer program used to select the random numbers
E) The list of all those who voted in two of the last three presidential primary elections

7) The target **population** in this example is:

A) Likely primary election voters in the state
B) The 488 people who answer that they would favor moving the primary
C) The 800 people who responded to the survey
D) The computer program used to select the random numbers
E) The list of all those who voted in two of the last three presidential primary elections

8) Notice that those who are younger than 22 now are not old enough that they could have voted in the last two presidential primary elections, and so they cannot be part of this sample. This is an example of:

A) Dropouts
B) Nonadherers
C) Nonresponse
D) Refusals
E) Undercoverage

9) If they decided to sample in two parts, taking 800 as described above and also taking 200 from among the registered voters under age 22, this would be an example of a:

A) Cluster Sample
B) Matched Pairs Design
C) Simple Random Sample
D) Stratified Random Sample
E) Systematic Sample

REPEATED FROM THE PREVIOUS PAGE

Questions 5-14 are based on the following description

A recent poll in Indiana was conducted to see what percentage of all likely voters for the state's upcoming presidential primary election would favor moving the primary from May to January. A sample of size 800 was chosen by using the list of all living voters who had voted in at least two of the last three presidential primary elections. The sample was chosen by numbering everyone who was on the list and then selecting 800 of those numbers at random using a computer program like we saw in class. 488 of the 800 contacted by phone favored moving the Indiana primary from May to January, and 312 were not in favor of moving the primary.

10) What is the **percentage** ($\hat{p}$) of those surveyed who favored moving the primary?

A) $\frac{1}{\sqrt{488}} = 0.045 = 4.5\%$

B) $\frac{1}{\sqrt{800}} = 0.035 = 3.5\%$

C) $\frac{1}{800} = 0.001 = 0.1\%$

D) $\frac{488}{800} = 0.61 = 61\%$

E) $\frac{1}{488} = 0.002 = 0.2\%$

11) What would the **margin of error** be at the 95% confidence level?

A) $\frac{1}{\sqrt{488}} = 0.045 = 4.5\%$

B) $\frac{1}{\sqrt{800}} = 0.035 = 3.5\%$

C) $\frac{1}{800} = 0.001 = 0.1\%$

D) $\frac{488}{800} = 0.61 = 61\%$

E) $\frac{1}{488} = 0.002 = 0.2\%$

12) The **parameter** is:

A) Likely primary election voters in the state
B) The 800 people who responded to the survey
C) The margin of error
D) The percentage of people in the sample who favor moving the primary
E) The percentage of people in the population who favor moving the primary

13) The **statistic** is:

A) Likely primary election voters in the state
B) The 800 people who responded to the survey
C) The margin of error
D) The percentage of people in the sample who favor moving the primary
E) The percentage of people in the population who favor moving the primary

14) Increasing the sample size would

A) Reduce the bias of the parameter
B) Reduce the bias of the statistics
C) Reduce the variability of the parameter
D) Reduce the variability of the statistic
E) None of the Above

Questions 15-16 are based on the following paragraph
A recent telephone poll by Best Buy found that 41% of HDTV owners said they understand little to nothing at all about HDTV. The margin of error for this result is +/- 3 percentage points at the 95 percent confidence level.

15) Which of the following statements is true:

A) In 95% of surveys conducted using a method like this, the true population percentage will be within 3% of the percentage from the sample.
B) The percent of those in the population who say that they understand little or nothing about HDTV is a random quantity and there is a 95% chance that it is between 38% and 44%.
C) There is a 3% chance that the percentage of people in the sample who said they understood little or nothing about HDTV was 3%
D) There is a 95% chance that the percentage of people in the sample who said they understood little or nothing about HDTV was 41%.
E) There is a 95% chance that the percentage of people in the sample who said they understood little or nothing about HDTV was between 38% and 44%.

16) The **margin of error** could be made smaller by:

A) Decreasing the sample size
B) Increasing the sample size
C) Using a larger confidence level
D) All of the above
E) None of the above

Questions 17-25 are based on the following paragraph

A researcher is conducting an experiment to see if having brighter light bulbs and lighter colored counter-tops leads to more sanitary kitchens. Forty families moving into University Housing agree to be part of an experiment regarding "kitchen usage" in exchange for a $20 participation fee. Half of the kitchens have the equivalent of 150 watts of lighting and the other half have the equivalent of 250 watts of lighting. Half of the kitchens have light colored countertops and half have dark colored ones. However, none of the new residents are told that the units are intentionally different or that cleanliness is the "usage" being monitored. The kitchens are all professionally sanitized before anyone moves in and have their level of bacterial contamination measured at the end of one month. From past studies, the researcher also knows that having infants in the family and the frequency of dining out might have an affect as well.

17) R**esponse variable(s)** in this experiment are

A) The effective wattage of the kitchen lights and darkness of the counter tops
B) The forty families moving into University housing
C) The level of bacterial contamination at the end of one month
D) The presence of infants in the family and frequency of eating out
E) None of the above

18) E**xplanatory variable(s)** in this experiment are

A) The effective wattage of the kitchen lights and darkness of the counter tops
B) The forty families moving into University housing
C) The level of bacterial contamination at the end of one month
D) The presence of infants in the family and frequency of eating out
E) None of the above

19) L**urking variable(s)** in this experiment are

A) The effective wattage of the kitchen lights and darkness of the counter tops
B) The forty families moving into University housing
C) The level of bacterial contamination at the end of one month
D) The presence of infants in the family and frequency of eating out
E) None of the above

20) Having a relatively **large number** of families (40) participate should:

A) Allow for the results to be generalized to all families
B) Control for confounding between the effects of the different explanatory variables
C) Control for confounding between the effects of the explanatory and lurking variables.
D) Increase the chances that the results found are statistically significant
E) None of the above

21) Not telling the subjects that you are measuring the effects the lights and counters have on cleanness should:

A) Makes the experiment controlled
B) Makes the experiment double-blind
C) Makes the experiment randomized
D) Makes the experiment single blind
E) None of the above

REPEATED FROM THE PREVIOUS PAGE

Questions 17-25 are based on the following paragraph

A researcher is conducting an experiment to see if having brighter light bulbs and lighter colored counter-tops leads to more sanitary kitchens. Forty families moving into University Housing agree to be part of an experiment regarding "kitchen usage" in exchange for a $20 participation fee. Half of the kitchens have the equivalent of 150 watts of lighting and the other half have the equivalent of 250 watts of lighting. Half of the kitchens have light colored countertops and half have dark colored ones. However, none of the new residents are told that the units are intentionally different or that cleanliness is the "usage" being monitored. The kitchens are all professionally sanitized before anyone moves in and have their level of bacterial contamination measured at the end of one month. From past studies, the researcher also knows that having infants in the family and the frequency of dining out might have an affect as well.

22) One possibility is to put all of the 150 watt systems with the dark counter tops and all of the 250 watt systems with light counter tops. Instead, making sure that the apartments are divided into four groups so that all four treatment combinations occur would:

A) Allow for the results to be generalized to all families
B) Control for confounding between the effects of the different explanatory variables
C) Control for confounding between the effects of the explanatory and lurking variables
D) Increase the chances that the results found are statistically significant
E) None of the above

23) **Randomly assigning** the families to the different apartment units would:

A) Allow for the results to be generalized to all families
B) Control for confounding between the effects of the different explanatory variables
C) Control for confounding between the effects of the explanatory and lurking variables
D) Increase the chances that the results found are statistically significant
E) None of the above

24) Using the University Housing will likely make it hard to:

A) Allow for the results to be generalized to all families
B) Control for confounding between the effects of the different explanatory variables
C) Control for confounding between the effects of the explanatory and lurking variables
D) Increase the chances that the results found are statistically significant
E) None of the above

25) Randomly assigning the families to the different units would be a ____1____. Breaking the families into groups based on having infants or not and dining out or not and then randomly assigning the families in each group separately would make this a___2____.

A) 1=block design, 2= matched pairs design
B) 1=block design, 2=completely randomized design
C) 1=completely randomized design, 2=matched pairs design
D) 1=completely randomized design, 2=block design
E) None of the above