***Instructions:***

*1. Make sure to save the word document you are working on.*

*2. Write your answer under each question in the Word document.*

*3. Use scratch paper and a calculator for resolving the problems.*

*4. Round to the nearest thousandth (i.e. 0.047) while doing calculations. Round Z(obtained) to the nearest hundredth (i.e. 0.05).*

**Section 1. Multiple Choice** (1 point each)

1. In tests of significance, if the test statistic falls inside of the critical region, we may conclude that:
	1. The **null hypothesis** fails to be rejected.
	2. The **null hypothesis** can be rejected.
	3. The **research hypothesis** can be rejected.
	4. The **research hypothesis** fails to be accepted.

**Write your answer here:** a) **The null hypothesis fails to be rejected**

1. In hypothesis testing, if the critical region begins at *Z* (critical) = $\pm 1.96$and the test statistic is – 1.90, we:
	1. Fail to reject the null hypothesis.
	2. Reject the null hypothesis.
	3. Cannot make a decision because the test statistic is too close to the critical region.

**Write your answer here:** a) **Fail to reject the null hypothesis**.

1. In a representative sample of 1,300 New Yorkers, 64% approve of the mayor’s ideas to expand affordable housing. If you want to estimate this value in the total population of New Yorkers. You will:
2. perform a 2-sample hypothesis test.
3. construct a confidence interval.
4. perform a 1-sample hypothesis test.
5. None of the above.

**Write your answer here:** **construct a confidence interval**

1. Samples of Republicans and Democrats have been tested for their level of support for welfare reform with a 2-sample hypothesis test. The test statistic (z obtained) is 2.71, and the critical region begins at ± 2.58. What may we conclude?
	1. The difference between Republicans and Democrats on this issue **is** **significant**. The difference we observe is not due to random chance alone.
	2. The difference between Republicans and Democrats on this issue **is not** **significant**. The parties are not statistically different on this issue.
	3. None of the above.
	4. **Write your answer here:** The difference between Republicans and Democrats on this issue **is not** **significant**. The parties are not statistically different on this issue.
	5. Where would the critical region begin in a lower-tail, 1-tailed hypothesis test that uses an alpha level of .10? **Hint**: use the Z-table
	6. -1.65
	7. -1.29
	8. -2.33
	9. -1.96

**Write your answer here:** -1.29

1. A group of researchers conducted a survey to determine if older people have different feelings about abortion compared to younger people. They used an alpha level of 0.05 (*Z* critical = ±1.96) to test for significance and found that their computed test statistic (Z obtained) was 0.80. Which of the following conclusions is justified?
	1. Feelings about abortion do not necessarily vary by age.
	2. Older and younger people have significantly different feelings about abortion.
	3. Older people are significantly more likely to support abortion.
	4. Older people are significantly less likely to support abortion.

**Write your answer here:** Older and younger people have significantly different feelings about abortion

1. In a representative sample of 250 Brooklyn College students, the average amount of credit card debt is $651. If a researcher wants to use this data to estimated that the average debt of all Brooklyn College students, what procedure should she perform:
	1. Establish the alpha level.
	2. Estimate the confidence level.
	3. Establish the margin of error.
	4. Estimate the confidence interval.

**Write your answer here:** Establish the alpha level, Estimate the confidence level, Estimate the confidence interval, Establish the margin of error.

1. 39% of a representative sample of 450 Queens residents identify as Black/African American. 43% of all NYC residents identify as Black/African American. In this research situation

a.) The sample proportion (*Ps*) is .39 and the population proportion (*Pu*) is .43.

b.) The population proportion (*Pu*) is .43 and sample proportion (*Ps*) is 450.

c.) The sample proportion (*Ps*) is .39 and the population proportion (*Pu*) is 450.

d.) The population proportion (*Pu*) is .39 and the sample proportion (*Ps*) is .43.

**Write your answer here:** The sample proportion (*Ps*) is .39 and the population proportion (*Pu*) is .43

1. When testing the significance of the difference between two sample proportions, the null hypothesis is

* 1. H0: Ps1 = Ps2
	2. H1: Ps1 ≠ Ps21
	3. Pu = (1 - Pu)
	4. H0: Pu1 ≠ Pu2
	5. **Write your answer here:** H0: Ps1 = Ps2
1. The central problem in the case of two-sample hypothesis test is to determine:

a.) if the samples are different in size (N).

b.) if the samples are random.

c.) if a value from a sample is different from the value in the general population.

d.) if a value from one sample is different from the value of another sample.

**Write your answer here:** .) if a value from one sample is different from the value of another sample.

1. A sample of people attending NASCAR events averages 11.4 years of formal education while the surrounding community averages 12.1. The difference is significant at the .05 level using a **1-tail test**. What could we conclude?

a.) People who attend NASCAR events **have** **significantly different** education achievement than the community as a whole.

b.) People who attend NASCAR events **do not have significantly different** education achievement than the community as a whole.

c.) People who attend NASCAR events **are significantly less** educated than the community as a whole.

d.) People who attend NASCAR events **are not significantly more** educated than the community as a whole.

**Write your answer here:** b.) People who attend NASCAR events **do not have significantly different** education achievement than the community as a whole.

1. A one-tailed hypothesis test can only be used for one-sample situations:
	1. True
	2. False

**Write your answer here:** true

1. The Null hypothesis and the Research hypothesis are always opposite from one another:

a.) True

b.) False

**Write your answer here:** true

**Section 2. Short answers** (3 points each)

Write at least 3 sentences for each answer. Feel free to provide examples.

1. What is the goal of Inferential Statistics?

**Write your answer here:** To draw conclusions from a sample and generalize them to a population from which the sample was drawn eg in inferential statistics we calculate mean, median, variances of a sample and interpret it as that of the represented population.eg the mean age of students selected at random being 15 means the average age of students in the entire class is 15

1. What is the difference between a population parameter and a sample statistic?

**Write your answer here:** a parameter is a value that describes a characteristic of an entire population such as the mean while a sample statistic is a piece of information we get from a fraction of a population,

**Problem solving** (3 points each)

***Instructions:***

*Use scratch paper and a calculator for resolving the problems.*

16.) A polling organization surveyed a representative sample of 917 New York City residents about their opinion on random drug testing for taxi drivers and found that 44.1% favored it. Estimate the value in the population at the 99% confidence level.

**Write your answer here. You must write at least 2 full sentences:** Pu= 40.27%. Again Pu =48.07%

17.) According to recent statewide population data from a given state, 44% of the general population reject to allow casinos in the state. In a random sample of 308 rural precincts, 47% of voters rejected the proposal. Did rural voters reject the proposal at a significantly different rate than the general population? Use an alpha level of .10.

**Write your answer here.** *(Include the Null hypothesis in one sentence and write the answer in at least 2 full sentences)* **null hypothesis: rural voters reject the proposal at a different rate than the general population.**. Z obtained(1.06) is less than the z from the tables (1.29) which means it is within the acceptance region and the null hypothesis is therefore accepted thus rural voters reject the proposal at a significantly different rate than the general population.

18.) A researcher is interested in gender differences in attitudes toward flying. Polling representative samples of 205 men and 215 women, they find that 33% of the men and 42% of the women are fearful of flying. Are difference between men and women statistically significant? Use an alpha level of .01.

**Write your answer here.** *(Include the Null hypothesis in one sentence and write the answer in at least 2 full sentences)* gender differences in attitudes toward flying are statistically significant.

gender differences in attitudes toward flying are statistically significant. The standard deviations differ by 0.039 therefore small variance and again the population proportion of 37.6% is between Ps1 and Ps2.