***E370, Spring 2016***

***Lab Activities week of 4/4/2016***

***Valued at 25 points***

Solve the following problems. Please follow the instructions given and show your work and any Excel commands you use to obtain full credit.

1. A national survey of restaurant employees found that 75% said that work stress had a negative impact on their personal lives. An executive of a restaurant chain wants to know whether this number underestimate the work stress of his employees at a level of significance of 8%. A random sample of 100 employees of the chain are selected and 80 answer “Yes” when asked “Does work stress have a negative impact on your personal life?” Use the information to answer the following questions. (15 points)
2. State the null and alternative hypotheses. (3 points)
3. Write out the decision rule using the p-value. (2 points)
4. Calculate the standardized test statistic. Then obtain the p-value for this test. (4 points)
5. Make a decision based on the decision rule in b and interpret your result in terms of the problem. (2 points)
6. Calculate the critical value for this test and write a decision rule using the critical value you have calculated. (2 points)
7. What would your decision be for this test using the critical value method? Is that different with p-value method? (2 points)
8. The following table is partial output from Excel’s Descriptive Statistics. The data are fill observations of 2-liter bottles of soft drink. Use this information to answer the next questions. (10 points)

|  |  |
| --- | --- |
| Amount | Operations control is concerned that the profit margin is eroding and wants to know if their two-liter bottles are overfilled at a level of significance of 6%. They want to use the p-value method for the test. |
| Standard Deviation | 0.0565 |
| Sample Variance | 0.00319 |
| Sum | 200.93 |
| Count | 100 |

1. State the null and alternative hypotheses. (2 points)
2. Write a decision rule using the p-value. (2 point)

1. Calculate the standardized test statistic and give the p-value. (2 points)
2. Make a decision based on the decision rule in b and interpret your result in terms of the problem. (2 points)
3. What would be the result of the test if it was known that σ = 0.0565? Don’t calculate any number, but provide your reasoning. (2 points)