AS2 (Assignment 2, Unit 4): Computing the Z-test Statistic

Research Scenario #1

A researcher hypothesizes that zylex, a new antidepressant, will affect concentration. It is known that scores on a standardized concentration test is normally distributed with a μ= 50 and a σ= 12. A random sample of n=16 participants, aged 19-35, are chosen from the State of New Jersey. The sample is put on a six month dosage plan of zylex. After six months, all the participants are given a standardized concentration test. The researcher records the data and calculates a sample mean of M=56. Are the data sufficient to conclude that the drug, zylex, does have an effect on concentration?

Based on the above research scenario, please answer the following questions:

1. Name the population: _____
2. Name the sample: _____
3. What is the independent variable? _____
4. What is the dependent variable? _____
5. What is the appropriate hypothesis test? _____
6. What two means are you comparing in this test? _____
7. Please calculate the appropriate hypothesis test using all four steps:

Step 1:

Step 2:

Step 3:

Step 4: _____

Write the statistical statement for your results: _____

Interpret your results (relating back to the hypothesis):
_____
_____
_____

Is there a probability of Type I error? Yes _____ No _____

If yes, what is the probability of a Type I error? _____

Is yes, how could you have decreased that probability?
_____

Is there a probability of Type II error? Yes_____ No_____

If it is appropriate, please calculate effect size: Answer:_____

Research Scenario #2:

A researcher wanted to study the effect of alcohol on reaction time. She hypothesized that alcohol will INCREASE reaction time (participants will take longer to react). She selected a sample of n= 36 participants from Rutgers University. The 36 participants each consumed a 6-ounce glass of wine. Thirty minutes later, the researcher measured each participant's reaction time, using a standardized driving simulation task for which the regular population has a $\mu = 400$ msec reaction time with a $\sigma = 48$. The reaction time mean for the sample was M= 412 msec. Are the data sufficient to conclude that the alcohol significantly increased reaction time?

Based on the above research scenario, please answer the following questions:

1. Name the population: _____
2. Name the sample: _____
3. What is the independent variable? _____
4. What is the dependent variable? _____
5. What is the appropriate hypothesis test? _____
6. What two means are you comparing in this test? _____
7. Please calculate the appropriate hypothesis test using all four steps:

Step 1:

Step 2:

Step 3:

Step 4: _____

Write the statistical statement for the results: _____

Interpret your results (relating back to the hypothesis):
_____
_____
_____

Is there a probability of Type I error? Yes ____ No_____

Is there a probability of Type II error? Yes ____ No____

If appropriate, please compute effect size: Answer: _____