Quiz # 1 Stat 212-02

NAME: ID #: Serial #:

1. You know that the probability of committing a Type II error (β) is 5%, you can tell that the power of the test is
   a) 2.5%
   b) 95%
   c) 5%
   d) 97.5%
   e) unknown

2. If a test of hypothesis has a Type I error probability (α) of 0.01, we mean
   a) If the null hypothesis is true, we don't reject it 1% of the time.
   b) If the null hypothesis is true, we reject it 1% of the time.
   c) If the null hypothesis is false, we don't reject it 1% of the time.
   d) If the null hypothesis is false, we reject it 1% of the time.
   e) None of the above are correct.

3. The power of a statistical test is
   a) The probability of not rejecting H_0 when it is false.
   b) The probability of rejecting H_0 when it is true.
   c) The probability of not rejecting H_0 when it is true.
   d) The probability of rejecting H_0 when it is false.
   e) None of the above are correct.

4. Suppose we wish to test H_0: $\mu \leq 47$ versus H_1: $\mu > 47$. What will result if we conclude that the mean is greater than 47 when its true value is really 52?
   a) We have made a Type I error.
   b) We have made a Type II error.
   c) We have made a correct decision
   d) Not enough information to decide.
   e) None of the above are correct.

5. How many Kleenex should the Kimberly Clark Corporation package of tissues contain? Researchers determined that 60 tissues is the average number of tissues used during a cold. Suppose a random sample of 100 Kleenex users yielded the following data on the number of tissues used during a cold: $\bar{X} = 52$, $s = 22$. Give the null and alternative hypotheses to determine if the number of tissues used during a cold is less than 60.
   a) $H_0: \mu \leq 60$ and $H_1: \mu > 60$.
   b) $H_0: \mu \geq 60$ and $H_1: \mu < 60$.
   c) $H_0: \mu \leq 60$ and $H_1: \mu \geq 60$.
   d) $H_0: \bar{X} \geq 60$ and $H_1: \bar{X} < 60$.
   e) $H_0: \bar{X} = 52$ and $H_1: \bar{X} \neq 52$.

6. How many Kleenex should the Kimberly Clark Corporation package of tissues contain? Researchers determined that 60 tissues is the average number of tissues used during a cold. Suppose a random sample of 100 Kleenex users yielded the following data on the number of tissues used during a cold: $\bar{X}$ = 52, s = 22. Using the sample information provided, calculate the value of the test statistic.
   a) $t = (52 - 60) / 22$
   b) $z = (52 - 60) / (22 / 100)$
   c) $z = (52 - 60) / 22$
   d) $t = (52 - 60) / (22 / 100^2)$
   e) $t = (52 - 60) / (22 / 10)$

7. How many Kleenex should the Kimberly Clark Corporation package of tissues contain? Researchers determined that 60 tissues is the average number of tissues used during a cold. Suppose a random sample of 100 Kleenex users yielded the following data on the number of tissues used during a cold: $\bar{X}$ = 52, s = 22. Suppose the alternative we wanted to test was $H_1 : \mu < 60$. State the correct rejection region for α = 0.05.
   a) Reject H_0 if $t > 1.6604$.
   b) Reject H_0 if $t < -1.6604$.
   c) Reject H_0 if $t > 1.9842$ or $Z < -1.9842$.
   d) Reject H_0 if $t < -1.9842$.
   e) Reject H_0 if $t > -1.6604$.

8. How many Kleenex should the Kimberly Clark Corporation package of tissues contain? Researchers determined that 60 tissues is the average number of tissues used during a cold. Suppose a random sample of 100 Kleenex users yielded the following data on the number of tissues used during a cold: $\bar{X}$ = 52, s = 22. Suppose the test statistic does fall in the rejection region at α = 0.05. Which of the following decision is correct?
   a) At α = 0.05, we do not reject H_0.
   b) At α = 0.05, we reject H_0.
   c) At α = 0.05, we accept H_0.
   d) At α = 0.10, we do not reject H_0.
   e) None of the above are correct.

9. We have created a 95% confidence interval for μ with the result (10, 15). What decision will we make if we test $H_0 : \mu = 16$ versus $H_1 : \mu \neq 16$ at α = 0.025?
   a) Reject H_0 in favor of H_1.
   b) Accept H_0 in favor of H_1.
   c) Fail to reject H_0 in favor of H_1.
   d) Fail to accept H_0 in favor of H_1.
   e) We cannot tell what our decision will be from the information given.

10. The owner of a local nightclub has recently surveyed a random sample of n = 250 customers of the club. She would now like to determine whether or not the mean age of her customers is over 30. If so, she plans to alter the entertainment to appeal to an older crowd. If not, no entertainment changes will be made. Suppose she found that the sample mean was 30.45 years and the sample standard deviation was 5 years. What is the p-value associated with the test statistic?
   a) 0.3577
   b) 0.1423
   c) 0.98
   d) 0.0780
   e) 0.02