Ryerson University
F16 QMS 202
Practice Questions for Lecture 3
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1. For the hypothesis $H_0 : \mu = 100$, $H_1 : \mu \neq 100$, and for a sample of a fixed size n, why is β smaller if the actual value of μ is 75 than if the actual value μ is 90?

   a) Because $100 - 90 < 100 - 75$.

   (b) If all other things are fixed, the closer the hypothesized mean is to the actual mean, the larger the risk of committing a Type II error will be.

   c) If all other things are fixed, since $75 < 90$ the β corresponding the the actual value 75 is smaller than the β corresponding the the actual value 90.

   d) The question cannot be answered because we do not know the level of significance α.

2. What is the p-value, if in a two-tail hypothesis test $Z_{STAT} = 2.5$?

   a) 0.3225

   b) 0.1245

   (c) 0.0124

   d) None of the above.

3. What is your statistical decision if you test the null hypothesis at the 0.01 level of significance in the problem above?

   (a) Do not reject H_0

   b) Reject H_0

   c) Accept H_1

   d) Reject H_1

4. A company that sells a brand of soft drink with a label of 355 ml is suspected of cheating its customers. The consumers understand that it is not necessary that every can contain 355 ml, but the average should be close to 355 ml. They believe that the average amount in the cans is not close to 355 ml. A group of concerned consumers has approached a consumer advocate who has found that the bottling process that fills this type of can has a standard deviation of 2 ml and the volume of soft drink in the cans will fit a normal distribution. To obtain evidence, a sample of 4 cases of 24 cans was measured carefully and the mean volume was found to be 354.5 ml. Does this evidence support the claim of the consumers at the 1% and 5% level of significance?

   **Which of the following would be an appropriate alternative hypothesis? **

   a) $H_0 : \mu = 355$ ml

   b) $H_1 : \mu = 354.5$ ml

   c) $H_0 : \mu \neq 355$ ml

   (d) None of the above.

5. A company that sells a brand of soft drink with a label of 355 ml is suspected of cheating its customers. The consumers understand that it is not necessary that every can contain 355 ml, but the average should be close to 355 ml. They believe that the average amount in the cans is not close to 355 ml. A group of concerned consumers has approached a consumer advocate who has found that the bottling process that fills this type of can has a standard deviation of 2 ml and the volume of soft drink in the cans will fit a normal distribution. To obtain evidence, a sample of 4 cases of 24 cans was measured carefully and the mean volume was found to be 354.5 ml. Does this evidence support the claim of the consumers at the 1% and 5% level of significance?

   **Match the following items

   a) At $\alpha = 0.01$

   b) At $\alpha = 0.05$

   with

a) Do not Reject H_0

b) Reject H_0

c) Reject H_1

d) Accept H_1

to form correct decisions**

Answer: a) and a) ; b) and b)

6. A company that sells a brand of soft drink with a label of 355 ml is suspected of cheating its customers. The consumers understand that it is not necessary that every can contain 355 ml, but the average should be close to 355 ml. They believe that the average amount in the cans is not close to 355 ml. A group of concerned consumers has approached a consumer advocate who has found that the bottling process that fills this type of can has a standard deviation of 2 ml and the volume of soft drink in the cans will fit a normal distribution. To obtain evidence, a sample of 4 cases of 24 cans was measured carefully and the mean volume was found to be 354.5 ml.

   **Does this evidence support the claim of the consumers at 5% level of significance? **

   (a) The evidence supports the consumers' claim.

   b) The evidence does not support the consumers' claim.

   c) It cannot be answered because we do not know Z_{STAT}.

-The end-