

UNIVERSITY OF TEXAS AT AUSTIN

## Quiz # 15

t-procedures: Two means.

Provide your **complete solution** to the following problems.

**Problem 15.1.** (8 points) *Source: Problem #7.74 from Moore-McCabe-Craig.*

Researchers were interested in the long-term psychological effects of being on a high-carbohydrate, low-fat (LF) diet versus a high-fat, low-carbohydrate (LC) diet. A total of 106 overweight and obese participants were randomly assigned to one of these two energy-restricted diets. At 52 weeks, 32 LC dieters and 33 LF dieters remained. Mood was assessed using a total mood disturbance score (TMDS), where a lower score is associated with a less negative mood. The sample average for the LC group was 47.3 with the sample standard deviation of 28.3. The sample average for the LF group was 19.3 with the sample standard deviation of 25.8. At the 0.05 significance level, is there a difference in the mean mood between the two kinds of dieters?

**Problem 15.2.** (7 points) *Source: Ramachandran-Tsokos.*

A study of two kinds of machine failures shows that 58 failures of the first kind took on the average 79.7 minutes to repair with a sample standard deviation of 18.4 minutes, whereas 71 failures of the second kind took on average 87.3 minutes to repair with a sample standard deviation of 19.5 minutes. Find a 99% confidence interval for the difference between the true mean amounts of time it takes to repair failures of the two kinds of machines. Assume the normal distribution for the repair times.