STAT2201, Semester 1 2016

Quiz #3b (25 minutes)

Name:_____

Student ID:_____

Lecture to which you are **enrolled** (circle one): Thursday / Friday

Let M be your month of birth, i.e. $M \in \{1, 2, \ldots, 12\}$. $M =$ _____.

The quiz has two questions - one on each side of this paper. Please write your answers on this paper only. Do NOT hand in the formula sheet.

Question 1: You obtain a sample of $n = 5 + M$ weight observations (the sample size in the question depends on your month of birth). Upon computing the sample mean ($\bar{x}$) and sample standard deviation (s) you find:

$$\bar{x} = 72.4, \qquad s = 8.2.$$

(a) Obtain a 95% confidence interval for the population mean weight:

(b) What assumptions are required for this confidence interval to be valid?

Question 2: You are comparing the heights of two groups of items: 1 and 2. You wish to determine if their population means are the same or not. In the comparison you assume that heights are distributed Normally with a mean of μ_i for group i and with the same variance for both groups, denoted by σ^2; but the means and variance are not known.

You obtain two random samples with n_i observations for group i. Upon computing the sample means (denoted by $\bar{x}_i$) and sample standard deviations (denoted by s_i) you find:

$$\bar{x}_1 = 24.3, \qquad \bar{x}_2 = 27.4, \qquad s_1 = 3.2, \qquad s_2 = 2.7.$$

Assume that $n_1 = 12 + M$ and $n_2 = 8 + M$ (i.e. the number of observations in the question depends on your month of birth).

(a) Use the pooled sample variance to calculate your estimate for the population standard deviation σ:

estimate of σ = _____

(b) Write out the hypotheses associated with this question:

H_0:

H_A:

(c) Calculate the test statistic and draw your conclusion with $\alpha = 0.1$: