Statistics 1040, Section 006, Quiz 12 (20+ Points)

Due on or before December 11, 2002

Your Name: _____

This is a take–home quiz. You should work on it on your own and bring it to me on or before the final examination day. Please work on this quiz independently, getting as little help as possible from your friends, books, and notes.

Question 1:

(20 Points) A thermostat used in an electrical device is to be checked for the accuracy of its design setting of 200 degrees Fahrenheit. Ten thermostats were tested to determine their actual setting, resulting in the following data:

202.2	203.4	200.4	202.5	206.3	198.0	203.7	200.8	201.3	199.0

Is the mean setting of these thermometers different from 200 degrees Fahrenheit? State the null and the alternative hypothesis, calculate test statistic (after finding the average and SD of the sample), obtain the P–value, and clearly state your conclusions. Assume that the thermometer settings follow the normal curve.

The following questions are extra–credit questions. You may obtain a maximum of 20 extra–points if you complete both questions.

Question 2:

(10 Points) In an experiment to study the dependence of hypertension on smoking habits, the following data were taken on 180 individuals:

	Nonsmokers	Moderate Smokers	Heavy Smokers
Hypertension	21	36	30
No hypertension	21	26	21

Is the presence or absence of hypertension independent of smoking habits? Conduct an appropriate statistical test to answer this question.

Question 3:

(10 Points) A study was made to estimate the difference in salaries of college professors in private and state colleges of North Carolina. A random sample of 100 professors in private colleges showed an average 9–month salary of $32,000 with a standard deviation of $1300. A random sample of 200 professors in state colleges showed an average salary of $32,900 with a standard deviation of $1400. Is there any statistical evidence that professors in state colleges have **higher average salaries** than professors in private colleges? Conduct an appropriate statistical test to answer this question.