Time: 2 hours | **MATH 207** | **Jan.31, 2000**

Final Exam

Form 2 | **First Semester, 1999-2000**

Instructions: 1) **Write down the formulas you use in each problem and show all your work.**

2) Round answers to two places after the decimal point.

3) Write down the number of the form you are answering on the top left corner of the front cover of your answer sheet.

1.Telephone companies conduct surveys to obtain information on the duration of telephone conversations. A sample of 12 phone calls yields the following durations to the nearest minute.

4	2	1	2	2	8
6	3	1	3	1	15

a) Obtain the mean duration of this sample of 12 calls.
b) Obtain the range of the durations.
c) Obtain the sample standard deviation of the durations.

2.In the U.S., the mean monthly fuel expenditure, per household vehicle is $58.80. The standard deviation is $30.40.

a) Determine the sampling distribution of the mean for samples of size 50. (Give shape, mean, standard deviation.)

b) What is the probability that the mean monthly fuel expenditure for a random sample of 50 such vehicles be $25 or less?

3. A stock market analyst has kept records for the past several years of the daily selling price of a particular blue-chip stock. The resulting distribution of scores is normally shaped with a mean μ = $84.10 and a standard deviation σ = $7.62.

a)What percentage of selling prices were between $76 and $88?

b)What percentage of selling prices were above $70?

4.The average weight of a certain population of males is 73kg. with a standard deviation σ=9.1kg. A random sample of 100 males is selected from the population. Their mean weight is $\bar{x}$ = 71.4kg. At the 10% significance level, do the data provide sufficient evidence to conclude that the mean weight of that population is different from 73kg?

5. In a small class in a statistics course, a professor gave 2 short quizzes graded over 10. The professor wants to determine if the scores students received on the second quiz are correlated with their scores on the first. Here are the students' respective grades in the 2 quizzes:

Quiz I	Quiz II
6	6
8	10
7	8
7	7
5	7
8	9
8	7
6	9

a)Calculate the linear correlation coefficient r.
b)Interpret the value of r in terms of the linear relationship between the grades in the 2 quizzes.

6.A 99% confidence interval for the mean hourly rate for people employed in the manufacturing industry was calculated by using a sample of 30 such people. The 99% confidence interval is from \$12.3 to \$15.3.

a) Determine the margin of error, E.

b) Determine the sample size required to ensure that we can be 99% confident that μ is within \$0.50 of our estimate $\bar{x}$. Use $\sigma =$ \$3.25.

7. A college counselor wants to determine the average amount of time first year students spend studying. He randomly samples 61 students from the freshman class, and asks them how many hours per week they study. The mean of the resulting scores is 20 hours and the standard deviation is 6.5 hours. Construct the 95% confidence interval for the population mean.