Name **MAT 330-Introduction to Statistics**
Date **Assignment #11**

1. The mean G.P.A (grade point average) of all male students at a college is 2.75 and the mean G.P.A of all female students at the same college is 2.98. The standard deviations of the G.P.As are 0.36 for the males and 0.30 for the females. Suppose we take one sample of 48 male students and another sample of 41 female students from this college. Assume the populations are normally distributed.

   a. What is the mean, rounded to two decimal places, of the sampling distribution of the difference between the mean G.P.As for males and females?

   b. What is the standard deviation of the sampling distribution of the difference between the mean G.P.As for males and females, rounded to four decimal places?

2. A sample of 12 from a population produced a mean of 84.4 and a standard deviation of 16. A sample of 16 from another population produced a mean of 71.9 and a standard deviation of 14. Assume that the two populations are normally distributed and the standard deviations of the two populations are not equal.

   The null hypothesis is that the two population means are equal, while the alternative hypothesis is that the mean of the first population is greater than the mean of the second population. The significance level is 2.5%.

   a. What is the number of degrees of freedom of the t distribution to make a confidence interval for the difference between the two population means?

   b. What is the standard deviation of the sampling distribution of the difference between the means of these two samples, rounded to three decimal places?

c. Derive the corresponding 99% confidence interval for the difference between the means of these two populations, rounded to three decimal places.

Lower limit:
Upper limit:

d. What is the p-value for this test, rounded to four decimal places?

e. Do you reject or fail to reject the null hypothesis at the 2.5% significance level? State your answer as "reject" or "fail to reject".

3. Given that 875 and 275, the value of b in the regression of y on x, rounded to two decimal places, is:

4. The table shown below gives six pairs of *x* and *y* values.

x	***y***
16	8
20	13
12	9
10	4
9	6
9	4

a. What are the values of SS_{xx} and SS_{xy} , rounded to three decimal places, are:

i. Part A: SS_{xx} =
ii. Part B: SS_{xy} =

b. For the regression of *y* on *x*, the values of *a* and *b*, rounded to two decimal places, are:

i. Part A: *a* =
ii. Part B: *b* =

c. Using the regression of y on x, the predicted value of y for x = 17, rounded to two decimal places, is:

5. The table shown below gives information on a variable for three samples selected from three normally distributed populations with equal variances.

Sample I	Sample II	Sample III
15	14	21
15	9	16
28	18	24
19	10	13
12	19	19

6.

By using ANOVA, we wish to test the null hypothesis that the means of the three corresponding populations are equal. The significance level is 1%.

a. The value of $\sum x$ is:

b. The value of $\sum x^2$ is:

c. The value of SSB, rounded to two decimal places, is:

d. The value of SSW is:

e. The value of MSB is:

f. The value of MSW, rounded to three decimal places, is:

g. The degrees of freedom for the numerator of the *F* distribution are:

h. The degrees of freedom for the denominator of the *F* distribution are:

i. The critical value of *F* is:
A) 4.81 B) 2.76 C) 6.93 D) 99.42

j. The value of the test statistic *F*, rounded to three decimal places, is: