

Name (Last, First) _____

Final

Instructions: Whenever a significance level is needed and not specified, use $\alpha = 0.05$. Only provide outputs that are directly related to your answers.

1. **Twelve** adults were put on a liquid diet in a weight-reducing plan. Weights were recorded before and after the diet. The data are shown below. Use an appropriate testing procedure of your choice to ascertain whether the plan was successful.

Weights on Liquid Diet												
	1	2	3	4	5	6	7	8	9	10	11	12
Before	186	171	177	168	191	172	177	191	170	171	188	187
After	188	177	176	169	196	172	165	190	166	180	181	172

2. An agriculture experiment was conducted to compare yield of four varieties of sweet potatoes. The experiment was conducted in a completely randomized design for four varieties. The data are in the following table. The yields are not assumed to be normally distributed. Perform a test to determine whether the yields are the same among varieties A, B, C and D.

Yields of Sweet Potatoes				
sample	Variety A	Variety B	Variety C	Variety D
1	8.3	9.1	10.1	7.8
2	9.4	9.0	10.0	8.2
3	9.1	8.1	9.6	8.1
4	9.1	8.2	9.3	7.9
5	9.0	8.8	9.8	7.7
6	8.9	8.4	9.5	8.0
7	8.9	8.3	9.4	8.1

3. Many students graduated from college are deeply in debt from student loans or credit card debts. A sociologist took a random sample of 401 single persons, classified them by gender, and asked “Would

you consider marrying someone who was \$25,000 or more in debt?” The results of this survey are shown in the following table.

Survey Results			
	Yes	No	Uncertain
Women	125	59	21
Men	101	79	16

- (a) What are *the expected counts* for the 2×3 table of the survey results?
 - (b) Perform a test to determine whether gender and survey response are associated.
4. One hundred insects of a particular species were put into a chamber and exposed to an insecticide for 15 seconds. The procedure was applied in random order of six times to each of the four insecticides. The response is the number of dead insects. Based on the data in the table of insecticide can you make a conclusion on the equality of mean rates of dead insects across four insecticides assuming all responses are normally distributed? What is your conclusion on the pairwise comparisons of the mean rates of dead insects cross the four insecticides?

Table of Dead Insects				
ID	Insecticide A	Insecticide B	Insecticide C	Insecticide D
1	85	90	93	98
2	82	92	94	98
3	83	90	96	100
4	83	91	95	97
5	89	93	96	97
6	92	81	94	99

5. In an experiment on decision making, five executives were exposed to three methods of quantifying the maximum risk premium they would be willing to pay to avoid uncertainty. The three methods are the utility method, the worry method, and the comparison method. Each subject was asked to state the degree of confidence in the method of quantifying the risk premium on a scale from 0 (no confidence) to 20 (highest confidence). It is assumed that the confidence scales are approximately normally distributed. The results of the experiment are presented in the table below.

It also can be found that the variance for all rating scores in the sample is $s_y^2 = 26.257$. Answer the following questions.

- (a) Complete the following ANOVA table.

Table of Methods of Executive

Executive	Method			Average
	Utility	Worry	Comparison	
1	1.3	4.8	9.2	5.10
2	2.5	6.9	14.4	7.93
3	7.2	9.1	16.5	10.93
4	6.8	13.2	17.6	12.53
5	12.6	13.6	15.5	13.90
Average	6.08	9.52	14.64	10.08

↑
grand mean

ANVOA Table

Source	df	SS	MS	<i>F</i>
method	(1)	(5)	(8)	(11)
executive	(2)	(6)	(9)	10.209
error	(3)	29.824	(10)	
total	(4)	(7)		

- (b) Test for the equality of confidence ratings among the three methods.
- (c) Test for the equality of confidence ratings among the five executives.
- (d) Test for the equality of confidence ratings of any pair of executives.
- (e) Test for the equality of confidence ratings of any pair of methods.