

Greetings! Welcome to the second in the latest trilogy of statistics exams. As you might remember, in the first exam you were asked to read the exam carefully and answer the questions *completely*. Do the same here. (Completely includes stating the null hypotheses and your conclusions.) Once again, points equal minutes, so the most time you should spend on any question is the number of minutes indicated by the point value. (In other words, you'll have to move along at a fairly brisk pace.) Also, keep in mind that the Skidmore Honor Code is in effect, so keep your eyes glued to your own exam. Good Luck and may the force fall equally on your groups!

1. Dr. Sam Antix was interested in the effects of word frequency on memory for words. To that end, he creates a list of 30 words, with 10 Low Frequency words (e.g., apothecary), 10 Medium Frequency words (e.g., abyss) and 10 High Frequency words (e.g., animal) in the list in a randomized order. He presents the list to 5 subjects to see how many of the words the subjects can recall (i.e., best performance would be recalling 10 out of 10 words from each category). The data from the subjects are seen below. Analyze the data completely, telling Dr. Antix what he could conclude on the basis of this study. (Some of the summary data are provided to ease your task.) [20 pts]

	Low	Medium	High
	2	2	4
	3	2	6
	2	4	8
	1	3	6
	1	3	7
X (T)	9	14	31
X ²	19	42	201
Mean	1.8	2.8	6.2
SS	2.8	2.8	8.8

SOURCE	SS	df	MS	F
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Total

2. Suppose that Dr. Antix was interested in testing the possibility that the mean recall of the population for Low Frequency words is 3. Based on the sample obtained in the preceding study, what would you tell Dr. Antix about this hypothesis? [10 pts]

3. The denominator of a test statistic is often used as an estimate of the variability present in some distribution. Tell me *very specifically* what is being estimated in the denominator of: [5 pts]

a. the single sample t-test

b. the independent groups t-test

c. the independent groups ANOVA

4. Dr. Cara Lott is interested in the impact of four different forms of relaxation therapy (five different forms if you include the No Therapy control condition) on the time it takes insomniacs to fall asleep. She has the subjects come to the sleep lab on the first night and gives them no therapy at all (to establish a baseline), then on the second night in the lab she first uses relaxation therapy A, then on the third night she uses relaxation therapy B, then on the fourth night she uses relaxation therapy C, and on the final night she uses relaxation therapy D. The dependent variable that Dr. Lott uses is the time it takes the insomniac to get to sleep, so smaller numbers are "better." She analyzes her data from the five nights using StatView, which produces the output seen below — except that the sloppy Dr. Lott has spilled white-out on the source table, obliterating some of the information. She's about to recompute the analysis when you stop her, saying "No need at all to do that...I can figure out the missing values from what you have here." Well, it's 'put up or shut up' time...complete the source table for Dr. Lott. Then tell Dr. Lott what she could conclude on the basis of the source table and what she should do next. You might also want to comment on her design...any suggestions? Finally, can you tell me how many subjects Dr. Lott ran in her study? [10 pts]

Source :	df:	Sum of Squares:	Mean Square:	F-test:	P value:
Between subjects	8	8142.044			
Within subjects	36	5697.2	158.256		
treatments		4332.578			.0001
residual		1364.622			
Total	44	13839.244			

5. Dr. Ignatius Pooh (Iggy to his friends) is interested in studying revulsion. To that end, he fashions chocolate into various shapes and then sees how long it takes people to eat his "creations." (Believe it or not, someone actually does research just like this!) In his latest study he randomly assigns 40 subjects to one of four conditions based on the shape into which the chocolate is formed (Doggy Doo [feces], Rattle Snake, Rabbit, Block [control condition]). The dependent variable is the time it takes for the subject to eat the chocolate (longer times indicate greater "revulsion"). Below is a partially completed source table for Dr. Pooh's study. Complete the source table and tell Dr. Pooh what he can conclude and what he should do next. [10 pts]

SOURCE	SS	df	MS	F
Between	30			
Within	180			
Total				