ID# _____ Exam 2 PS 217, Spring 2002

As always, the Skidmore Honor Code is in effect for this exam, so keep your eyes focused on your own exam. Read each question carefully and answer each question completely, showing all your work. You'll need to work quickly through the exam, because we've got a class coming in right after ours. So, don't spend more time on your answer to a question than the point value merits. Good luck on the exam…enjoy your weekend.

1. Drs. Dewey, Stink, & Howe were interested in memory for various odors. They conducted a study in which 6 participants were exposed to 10 common food odors (orange, onion, etc.) and 10 common non-food odors (motor oil, skunk, etc.) to see if people are better at identifying one type of odorant or the other. The 20 odors were presented in a random fashion, so that both classes of odors occurred equally often at the beginning of the list, at the end of the list, etc. (Thus, this randomization is a strategy that serves the same function as counterbalancing.) The dependent variable is the number of odors of each class correctly identified by each participant. The data are seen below. Analyze the data and fully interpret the results of this study. [15 pts]

	Food Odors	Non-Food Odors
	7	4
	8	6
	6	4
	9	7
	7	5
	5	3
$\sum X$ (T)	42	29
$\sum X^2$	304	151
SS	10	10.8

2. In most prisons there are a variety of treatment and rehabilitation programs, such as substance abuse and psychological and spiritual counseling, as well as academic and vocational education programs. An interesting question is whether corrections officers of various races are more likely to oppose such inmate programs and take a punitive attitude toward doing time (Jackson & Ammen, 1996). Using the following data, test the hypothesis that there are differences on a punitive attitude scale among White, African-American, and Hispanic corrections officers. (Higher scores on the scale indicate a greater punitive attitude.) [15 pts]

	White	African-American	Hispanic
Mean	27.90	21.77	25.58
Variance	9.55	11.49	9.18
n	30	30	30

Source	SS	df	MS	F
Treatment	567			28.2
Error				
Total				

3. Suppose that you were interested in computing an ANOVA on 3 sets of data from 30 different people, for which summary statistics are shown below. [5 pts]

	Group 1	Group 2	Group 3
Mean	15	20	40
Variance	10	20	60
n	10	10	10

a. What parameter the MS_{Error} is intended to estimate?

b. What the MS_{Error} would be in the ANOVA computed on the data?

c. [Careful!] What F_{Crit} would you use to evaluate the F_{Obt}?

4. Not only are repeated measures designs more powerful than independent groups designs, they are also more efficient ("more bang for the buck"). Give a specific example to illustrate the efficiency of a repeated measures design compared to an independent groups design. [3 pts]

5. People like Jacob Cohen suggest that we should conduct experiments with power of at least .80. What are they saying about the level of Type II error that they are willing to tolerate? [2 pts]

6. As you might recall from the last lab, we talked about research on the auditory localization abilities of bats. Suppose that Dr. Belfry was interested in conducting a similar study, looking at bats' abilities to avoid wires of varying thickness as they traverse a maze. The DV is the number of times that the bat touches the wires. (Thus, higher numbers indicate an inability to detect the wire.) Complete the source table below and fully interpret the results. [15 pts]

ANOVA Table for Wire Thickness

	DF	Sum of S...	Mean Sq...	F-Value	P-Value	Lambda	Power
Subject		37.026					
Category for Wire Thickness				102.232	<.0001	204.465	1.000
Category for Wire Thickness * Subject			.662				

Means Table for Wire Thickness
Effect: Category for Wire Thickness

	Count	Mean	Std. Dev.	Std. Err.
Thin Wire	13	4.923	1.553	.431
Medium Wire	13	3.077	1.256	.348
Thick Wire	13	.385	.650	.180