

OK, good luck on this exam. Keep your attention focused on your own exam. Work carefully and quickly through the exam, showing all your work on all problems. The point value for each question is indicated, which should give you some clue as to how long to spend on a question (e.g., you should only spend about 5 minutes on a 5-point question).

1. Since the last exam, we've covered t-tests (single-sample and independent groups) and analysis of variance (independent groups and repeated measures). Briefly sketch out the situations in which you'd use each of these statistics. (In other words, what is the purpose of each statistic?) [5 pts]

2. Below is the output from a StatView analysis of an experiment. Tell me as much as you can about the experiment (what sort of design, how many treatment levels, how many people participated, what you could conclude, etc.). [5 pts]

One Factor ANOVA-Repeated Measures for X<sub>1</sub> ... X<sub>3</sub>

Source:	df:	Sum of Squares:	Mean Square:	F-test:	P value:
Between subjects	7	19338.625	2762.661	1.57	.2148
Within subjects	16	28157.333	1759.833		
treatments	2	11260.583	5630.292	4.665	.028
residual	14	16896.75	1206.911		
Total	23	47495.958			

Reliability Estimates for- All treatments: .363      Single Treatment: .16

3. First-born children tend to develop language skills faster than their younger siblings. One possible explanation for the phenomenon is that first-borns have undivided attention from their parents. If this explanation is correct, then it is also reasonable that twins should show slower language development than single children and that triplets should learn even slower. Davis (1937) found exactly this result. The following hypothetical data demonstrate the effect. The dependent variable is the measure of language skill at age three for each child. Analyze the data as completely as you can. Tell me what you would conclude, especially in light of the original hypothesis. [25 pts]

	<u>Single Child</u>	<u>Twin</u>	<u>Triplet</u>	
	8	4	4	
	7	6	4	
	10	7	7	
	6	4	2	
	9	9	3	
T	40	30	20	<u>Sum</u> 90
X <sup>2</sup>	330	198	94	622
SS	10	18	14	

4. Given the data from the earlier problem (#3), test the hypothesis that the triplets were sampled from a population with a mean language skill score of 7 (i.e.,  $\mu = 7$ ). [10 pts]

5. Below is a partially completed source table for an experiment with 6 levels of the factor and sample size (n) of 20. First, complete the source table. Then, tell me explicitly how you would interpret the results and what you would do next. [10 pts]

Source	SS	df	MS	F
Between	100			2.0
Within				
<hr/>				
Total				