Biology 4605/7220
6 November 2002

Name		
		Exam #2b

For each of the following situations (1 and 2):

(A) Define variables in a tabular format, as follows.

name symbol scale

scale = nominal, ordinal, or cardinal cardinal = interval or ratio scale.

nv = number of variables

nt = number of terms

A. score = 3nv

B. score = nt

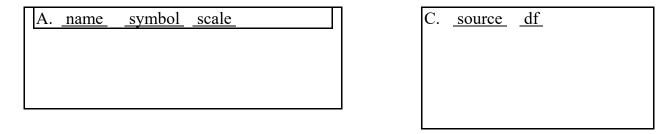
C. score = 2nv + 2

D. score = 1

- (B) Using the symbols, write a general linear model relating the response variable to explanatory variable(s) and interaction terms (if appropriate).
- (C) Complete the first two columns of the ANOVA table <u>source</u> <u>df</u>
- (D) State the name of the analysis, from the following list.

 t-test, one-way ANOVA, two-way ANOVA, three-way ANOVA
 paired comparisons, randomized blocks,
 hierarchical (nested) ANOVA
 regression, multiple regression,
 ANCOVA (at least 1 nominal and at least 1 cardinal scale explanatory variable)
 none of the above.
- 1. Height is frequently named as a good predictor variable of weight among people of the same age and gender. Roberts (*American Journal of Clinical Nutrition* 54:499) measured the heights (cm) and weights (kg) of 14 males between the ages of 19 and 26 years of age. Does weight depend on height?

 A=6 B=3 C=6 D=1



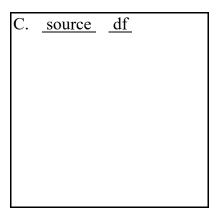
B. $\underline{\hspace{1cm}} = \underline{\hspace{1cm}} + \varepsilon \hspace{1cm} [3]$

D. [1]

2. Skinner and Allison (*J. Agric. Res.* 23:433-445) studied the effect of date of planting and amount of fertilizer (borax) on cotton growth, measured in pounds. Amount of borax was 0, 5, or 10 pounds. Three methods of borax application were (borax in drill & seed planted immediately, borax in drill & seed planted one week later, or borax broadcast). The experiment was carried out on 3 dates. When the analysis is carried out, all of the interaction terms were found to be non significant, with p-values of 0.173 or more. Write the model with no interaction terms.

A=12 B=5 C=10 D=1

A.	name	symbol	scale



B.
$$\underline{\hspace{1cm}} = \underline{\hspace{1cm}} + \varepsilon \hspace{1cm} [3]$$

3a. Define a 1995, p 210) mean	then defi	ne a sy	mbol for the	e observed (sample) me	an and th	e true (p	opulation)
3b. For the other obse	lata on sc rved mear		vidth (8 val	ues below) ^v	write	— (Sy	= mbol) =	[1] (Value)
3c. Write a j true mean								[2]
	vcdf c1 00 -2 50 -2 00 -1 00 -1 00 1 00 1	; s	UBC> t 7	•	for the 95%	% limits ?	,	[1]
3e. Compute		confid	lence limits			•••••	•••••	[2]
MTB > pr	int c2							
ScWidth	380	376	360	368	372	366	374	382
MTB > de	scribe	с2						
S	cWidth	N 8	MEAN 372.25	MEDIAN 373.00	TRMEAN 372.25		EV 5	SEMEAN 2.60

	e for which the total Sum of Squares is 100, 15% of this and the sample size is 10. Be sure to compute MS and F-
ratio	[12]
Ab Evalain how you would go	mpute a p-value for the F-ratio in the table you have
•	re heterogeneous and non normal[2]
constructed, if the restruction were	[2]
`	ecrease) of <u>doubling</u> the sample size, in the ANOVA table A table for regression)[3]
	. 146
increase decrease	in MS error
increase decrease	in F-ratio
increase decrease	in p-value