Biology 4605/7220 NAMES for credit _____
27 November 2019 Worksheet from 2015 review material on website

For the example circled, show on the reverse side:

(A) Variables in a tabular format, as follows.

name	symbol	scale	Explanatory is Random or Fixed

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

(B) Using the symbols, write a general linear model relating the response variable to explanatory variable(s) and interaction terms (if appropriate).

(C) Beneath each term in the model (except β_o) write the degrees of freedom.

1 . H.A. Wallace and G.W. Snedecor (1931 *Correlations and Machine Calculations*, Iowa State University Press) provide data on value of land ($) in relation to corn yield (bushels/acre) and pig brood stock (brood sows/1000 acre) for farms in 25 Iowa counties. Does land value depend on corn yield and pig brood stock ?

2. O.L. Lacey (*Statistical Methods in Experimentation*, New York: MacMillan, 1953) wished to determine the effects of glutamic acid injection upon maze learning in the rat. He has a colony of 70 rats at his disposal, each of known weight (grams). Lacey does not define "learning" but assume this is measured as the improvement (in minutes) in time taken to run a maze. Does injection of glutamic acid change learning, taking into account the effects of body size ?

3. B. Ostle and L.C. Malone (1988 *Statistics in Research* Iowa State University Press) provide data from an experiment by Mr. X, who sprayed apple trees with different concentrations of a nitrogen compound, then determined the amounts of nitrogen (mg/dm^2) remaining on the leaves. The experiment was executed with three levels (low medium high) of nitrogen, resulting in 3 measurements from the first experiment, and 3 from the second. Taking into account differences between experiments, does the amount of unabsorbed nitrogen (amount remaining) depend on level of nitrogen applied ?

4. B. Ostle and L.C. Malone (1988 *Statistics in Research* Iowa State University Press) provide data on average yield of oats (bushels/acre), pre-season precipitation (inches), and growing season precipitation (inches). They present 25 years of data, from a semiarid part of South Dakota.
Does yield depend on pre-season and growing season precipitation ?