Full Name:

Quiz #4
BIOSTAT 705 Spring 2023

1. For each statement below circle True/False statement:

   a) (2 pts) Rejecting the null hypothesis H_0 : No LoF for a model $y = \beta_0 + \beta_1 x + \beta_2 x^2 + \epsilon$, implies the model is lacking only cubic-term (ie, x^3)?
   True False

   b) (2 pts) Rejecting the null hypothesis $H_0 : \beta_3 = 0$, for a regression model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_1 x_2 + \epsilon$, implies the model is additive?
   True False

   c) (2 pts) The sum of deleted residual ($e_{-i} = \frac{e_i}{1-h_{ii}}$) is not equal to zero? (Note: $0 < h_{ii} < 1$)
   True False

   d) (2 pts) A strong correlation between dependent variable and at least 1 of the predictors, leads to a multicollinearity problem?
   True False

2. (4 pts) In a regression model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \epsilon$, to test the null hypothesis $H_0 : \beta_1 = \beta_3 = \beta_4 = \beta_5$ in a random sample with n observations, then the test statistic will have the following distribution:(circle the correct answer)

   a) $F_{4,n-5}$
   b) $F_{4,n-6}$
   c) $F_{3,n-5}$
   d) $F_{3,n-6}$
   e) None of the above

3. For question #2 above,

   a) (6 pts) Express the null hypothesis in terms of $A\underset{\sim}{\beta} = \underset{\sim}{c}$, provide A and $\underset{\sim}{c}$ which yield the correct formulation of H_0.

   b) (2 pts) The rank of matrix A above = 4? True False