SIMON FRASER UNIVERSITY Department of Economics

Econ 835 Quantitative Methods Prof. Kasa Fall 2002

MIDTERM EXAM

Answer the following questions True, False, or Uncertain. Briefly explain your answers. No credit without explanation. (10 points each).

- 1. All else equal, increasing the variance of the explanatory variables leads to more precise parameter estimates.
- 2. *t*-statistics are invalid if the model's error term is not normally distributed.
- 3. Least Squares residuals are always uncorrelated with the error term.
- 4. Increasing the significance level of test increases its power.
- 5. Since x^2 is an exact function of x, we will encounter the problem of 'multicollinearity' if we attempt to use both x and x^2 as regressors.

The following questions are short answer. Briefly explain your answer. Clarity will be rewarded.

- 6. (15 points). State the Gauss-Markov Theorem. On what assumptions is it based? Why is it important?
- 7. (10 points). Since we usually have only one sample of data, why should we be interested in the sampling distribution of an estimator?
- 8. (10 points). Two individuals are studying the relationship between wages and education. Mr. Bivariate simply runs a bivariate regression of wages on education, and concludes there is a negative relationship. Mr. Multiple runs a multiple regression of wages on education and experience, and concludes there is a positive relationship. What might account for their opposite conclusions? Who do you think is "right"?
- 9. (15 points). Some people have claimed that there is a "marriage premium" in labor markets, i.e., all else equal, married individuals earn more.
 - (a) Write down a wage equation that can test this claim.
 - (b) Write down a wage equation that can test whether the marriage premium is greater for men than for women.

For both parts, be sure to clearly state your null and alternative hypotheses, and explain exactly what test statistic you would compute.