FINAL Exam: Economics 463, Labor Economics Spring 2003 in R. Butler's class
YOUR NAME:_____
Section I (60 points) Questions 1-20 (3 points each)
Section II (80 points) Questions 21-28 (10 points each)
Section III (60 points) Questions 29-32 (15 points each)

I. Define or explain the following terms:
1. type II error-

2. BLUE (as a type of estimator)-

3. central limit theorem--

4. logit model-

5. dummy variable trap -

6. endogeneous variable-

7. maximum likelihood estimation--

8. F-test (Chow test)-

9. Goldfeld-Quandt test-

10. random walk-

11. identification problem (in simultaneous equation models)-

12. dynamically complete models--

13. [shazam code]: ols y x1 x2 / hetcov--

14. [shazam code]: 2sls y x1 x2 (x1 x3) ---

15. median--

16. one-tailed hypothesis test-

17. probability density function--

18. stochastic independence for random variables w,y--

19. t-distribution--

20. instrumental variable--

II. True, False, or Uncertain Questions
State whether the following quotations are True, False, or sometimes truth (uncertain), explaining why. You are graded only for your explanation, not for correctly indicating T or F.

21. "If age is measured in months rather than years, than the estimated age coefficient in an OLS regression will increase 12-fold but the other coefficients will remain unchanged."

22. "The assumption that $E(\mu \mid X) = 0$, implies that $E(\mu) = 0$ and that there is no simultaneous equation problem."

23. "$plim\ g(\hat{\theta}) = g(plim\ \hat{\theta})$ for nonlinear transformation g(.) only if $\hat{\theta}$ is normally distributed."

24. "The estimated regression wage = 50,000 + 100 age - 1.0 age squared, indicates that wages increase at a decreasing rate until they reach a maximum at about 100 years of age."

25. “In a linear regression model, if the sample means of X are zero and the sample means of Y is zero, then the intercept will be zero as well.”

26. "A first order autoregressive process, $y_t = \rho\, y_{t-1} + \mu_t$, where μ_t is white noise, is both stationary and weakly dependent if ρ <1.”

27. "The reduced form equation can always be estimated by OLS whereas the structural equation often cannot be estimated by OLS because the structural equation violates the full rank assumption."

28. "If heteroskedasticity is due to an omitted variable, the OLS estimator $\hat{\beta}$ will be unbiased but the estimated covariance matrix is biased (and so are the associated t-statistics)."

III. Some Proofs

29. From the assumptions of the Classical linear regression model (state them yourselves), derive the sampling distribution for the following for cross section data:

a. the sampling distribution for $\hat{\beta}$ the lease squares coefficient vector, and

b. the sampling distribution of Y_T, a forecast value of the dependent variable given a specific value of the regressor vector, X_T (i.e., $Y_T = X_T \hat{\beta}$).

30. Prove that under the standard assumptions, the OLS estimator for the variance, s^2, is an unbiased estimator for variance of the error term (when the error term is given in the usual linear model as μ in $Y = X\beta + \mu$).

31. Prove that under the standard assumptions (plus whatever large sample assumptions you need to make—be explicit what they are), the OLS estimators are consistent for the model $Y = X\beta + \mu$.

32. Derive the variance of the error in the linear probability model (where y is a vector of dummy variables):

$$y = X\beta + \mu .$$

b. Besides the errors, are there any other features of the linear probability model that present a problem for the econometrican?