

YOUR NAME: _____

Section I (30 points) Questions 1-10 (3 points each)

Section II (50 points) Questions 11-15 (10 points each)

Section III (20 points) Questions 16

Section I. Define or explain the following terms (3 points each)

1. restricted vs. unrestricted sum of squared errors-

2. omitted variable bias-

3. type two error-

4. population mean vs. sample mean-

5. collinear economic variables-

6. log-log model vs. linear-linear model-

7. a model that is linear in the coefficients but is nonlinear in the independent variables (the Xs)-

8. $E(\mu | X) = 0$ -

9. adjusted R-squared -

10. probability significance values (i.e., 'p-values')-

II. Some Concepts

11. Suppose that the joint distribution for random variables x, y is given as

$$f(x, y) = .6^x .4^{1-x} .3^y .52^{1-y} 2^{xy}$$

for values $x=0, 1$ and $y=0, 1$.

A. What are the joint probabilities $f(x=0,y=0)$, $f(x=0,y=1)$, $f(x=1,y=0)$, and $f(x=1,y=1)$?

B. calculate the marginal probability densities $f(x)$ and $f(y)$

C. Calculate $E(x)$ and $V(x)$ (no credit unless you show the right formulas).

D. Calculate the conditional probability density $f(y|x=0)$ (again, no credit unless you show the right formulas)

E. Are x and y independent? Why or why not?

Indicate whether the following statements in the next two questions are True, False or Uncertain (indicate which, you are graded only on your explanation for your answer).

12. "Normality is never really used in regression analysis, and so it really isn't a very important concept."

13. "Suppose wages are regressed on age in a simple regression model (wages are the dependent variable). Then changing the units of measurement of wages from dollars to cents will increase the intercept but not the slope; while changing the units of measurement of age from years to months will increase the slope but not the intercept."

14.a. Explain the Gauss-Markov theorem (but don't prove it).

b. Does this theorem apply to least squares estimators, or to least squares estimates, or both? Explain.

15.VARIABLE	ESTIMATED	STANDARD	T-RATIO	PARTIAL STANDARDIZED ELASTICITY			
NAME	COEFFICIENT	ERROR	180 DF	P-VALUE	CORR. COEFFICIENT	AT MEANS	ELASTICITY
AGE	0.10628E-01	0.4260E-02	2.495	0.013	0.183	0.1734	0.0656
WHITE	-0.36061	0.3587	-1.005	0.316	-0.075	-0.0650	-0.0584
MALE	0.20959	0.1148	1.826	0.070	0.135	0.1323	0.0191
YRHS	0.11875E-01	0.5543E-01	0.2142	0.831	0.016	0.0147	0.0232
YRCOL	0.93169E-01	0.2664E-01	3.497	0.001	0.252	0.2687	0.0271
EXEC	0.30588	0.3010	1.016	0.311	0.076	0.1859	0.0180
TECH_SAL	-0.64281E-01	0.3146	-0.2043	0.838	-0.015	-0.0259	-0.0012
SERV_OCC	-0.11243	0.3047	-0.3690	0.713	-0.027	-0.0611	-0.0045
OPER_OCC	0.14959	0.2912	0.5136	0.608	0.038	0.0819	0.0061
AG_CNSTR	0.40647	0.1997	2.036	0.043	0.150	0.1533	0.0066
MANUF	0.20933	0.1580	1.324	0.187	0.098	0.0947	0.0052
TRADE	0.28680	0.1617	1.773	0.078	0.131	0.1430	0.0090
PUB_ADMN	0.29599	0.2272	1.303	0.194	0.097	0.0869	0.0028
CONSTANT	5.3310	0.8682	6.140	0.000	0.416	0.0000	0.8814

|_test yrhs - yrcol =0
 TEST VALUE = -0.81293E-01 STD. ERROR OF TEST VALUE 0.63707E-01
 T STATISTIC = -1.2760425 WITH 180 D.F. P-VALUE= 0.20358
 F STATISTIC = 1.6282845 WITH 1 AND 180 D.F. P-VALUE= 0.20358

Where the log of wages is the dependent variable, and the independent variables are as defined in classroom presentation (YRHS=years of educational attainment up through the completion of high school, YRCOL=the number of years of post-high school educational attainment). What do the estimated coefficients, t-statistics, and F-test indicate about educational attainment's impact on wages?

16. Prove that the least squares estimator is consistent under the usual assumptions.