2018

ECONOMICS

ECO: 2.4

ELEMENTS OF ECONOMETRICS

Full Marks: 80

Time: 3 Hours

The figures in the margin indicates full marks for the questions

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1. Answer the following questions. 2x4=8
   a. What is a standard error?
   b. When do we simultaneous equation?
   c. Convert the equation to linear form: $CD = ak^c l^d$
   d. Why do we use dummy variables in a regression model?
2. Answer the following questions. 5x4=20
   a. Explain simultaneous equation with example.
   b. In the presence of multicollinearity, prove that the estimators are indeterminate.
   c Interpret the use of dummy variables for change in intercept over time.
   d. Elaborate the uses of adjusted R^2 and its relationship with the normal R^2.
3. Answer any two of the following questions. 10x2=20
   a. Formulate the standardized form of simultaneous equation model.

b. Discuss the role of order and rank condition for identification of SME.

c. Derive the variance, standard errors and the hypothetical set up for a two variable regression model.

d. Using OLS derive the estimators for a multiple regression model with all its CLRM assumptions.

4. Answer the following questions. 16x2=32

A. With all standard assumptions of the disturbance term, estimate the parameters for a 2-variable linear regression model. Show that the least square estimators are BLUE. (4+10+2=16)

OR

B. For a two-variable regression model prove that its estimators have the least variance. From the data given, estimate the elasticity of demand. (8+8=16)

Quantity(Y)	**69**	**76**	**52**	**56**	**57**	**77**	**58**	**55**	**67**	**53**	**72**	**64**
Price(X)	**9**	**12**	**6**	**10**	**9**	**10**	**7**	**8**	**12**	**6**	**11**	**8**

C. Given the average grade(G) of 10 students and income(Y) of their parents:

Grade(G)	**90**	**80**	**60**	**70**	**40**	**60**	**70**	**50**	**50**	**40**
Income(Y)	**25**	**21**	**15**	**15**	**9**	**12**	**18**	**6**	**12**	**8**

i. Estimate the regression line $G = \beta_0 + \beta_1 Y$

ii. Find the variance and standard erors of β_1

iii. Test the hypothesis that grades of students depend on the income of their parents. ($t_{0.05}$ for n = 9 is 1.833)

(10+3+3=16)

OR

D. What is a multiple regression model? Three related variables X_1, X_2, & X_3 take the following sets of values:

(2+10+4=16)

X_1	1	2	3	4	5
X_2	2	1	5	4	3
X_3	3	1	4	5	2

a. Find out the multiple regression equation of X_1 on X_2 and X_3.

b. Find out the value of R^2 and Adjusted R^2.

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