

APR 25 11:00 AM

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Reg. No. ....

**FOURTH SEMESTER M.Sc. DEGREE EXAMINATIONS, APRIL 2005**

**STATISTICS**

**PAPER - ECONOMETRICS (ELECTIVE II)**

Time : 3 Hours

Max. Marks : 70

Answer any FIVE questions, choosing one from each unit

**Unit 1**

1. (a) Define (i) production function (ii) constant returns to scale (iii) Cobb-Douglas production function (iv) producers equilibrium.  
b) Explain the problem of estimation of parameters in Cobb-Douglas production function. (8+6=14)
2. a) Explain homogeneous production function.  
b) Prove that for a linearly homogeneous Cobb-Douglas production function  $Q = AK^\alpha L^\beta$ ,  $\alpha =$  the output elasticity of the capital and  $\beta =$  the output elasticity of labour.  
c) Explain the elasticity of substitution. (4+6+4=14)

**Unit 2**

3. a) Describe the method of least squares for estimating parameters of a simple linear regression model. Show that estimators are best linear unbiased estimates, under some conditions to be stated.  
b) How do you test the hypothesis  $H_0: \beta_1 = 0$  for the model  $y_i = \beta_0 + \beta_1 X_i + U_i$ . Also suggest a method for the construction of confidence intervals for  $\beta_0$  and  $\beta_1$ ? (7+7=14)
4. a) Define (i) standard error of regression (ii)  $R^2$  (iii) tests of stability (iv) Analysis of variance.  
b) In the multiple regression equation  $y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + U_i$ , show that least square estimators and maximum likelihood estimators of  $\beta_i$ 's are identical, but the estimates of  $\sigma^2$  are different. (6+8=14)

**Unit 3**

5. a) Define Almon lag model. Discuss its utility? What are the statistical problems that arise in estimating such lag models.  
b) Explain the tests for rationality based on (i)  $y_{t-1}$  and (ii) tests of equality of coefficients. (8+6=14)
6. a) Describe non-linear regression models. Explain a method for estimating the parameters of this model.  
b) How do you test normality of errors?  
c) Explain different data transformation methods. (6+4+4=14)

**Turn Over**

Pmt

Unit 4

- 7. a) How do you detect the multicollinearity? Explain rule of thumb procedures to address the problem of multicollinearity.
- b) What do you mean by heteroscedasticity? Explain the consequences of using least square estimates in such situations? What are the remedial measures. (6+8=14)
- 8. a) Explain idea of Ridge regression and its properties.
- b) Discuss the method of estimation of the coefficients of linear model when errors are auto correlated.
- c) Describe Dubin Watson test for autocorrelation? (5+5+4=14)

Unit 5

- 9. a) Define recursive models. Explain the method of estimation of parameters of such models.
- b) Explain indirect least squares method of estimation. Discuss the properties of such estimators. (7+7=14)
- 10. a) Explain the structural form and reduced form of system of simultaneous equations. Explain the method of estimation for the just identified equation.
- b) What do you mean by an overidentified equation? Explain the method of two stage least squares for the estimation of such equations. Discuss the properties of such estimators. (7+7=14)

Three

1. (a)  
(b)

(c)  
2. (a)

(b)  
(c)

3. (a)

4.