LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **ECONOMICS**

FOURTH SEMESTER – **APRIL 2012**

# ST 4207 - ECONOMETRICS

Date : 19-04-2012 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**Section –A**

**Answer all the questions (10 x 2 = 20)**

1. Define Maximum likelihood estimation.
2. Give any two properties of normal distribution.
3. Mention the difference between statistic and parameter.
4. What is level of significance?
5. Distinguish between R2 and adjusted R2
6. What is meant by Intercept and Slope?
7. Define Multicollinearity.
8. Give any two forms of Glesjer test.
9. State the reason for lag.
10. Define specification error.

**Section –B**

**Answer any five questions (5 x 8 = 40)**

1. Data on the readership of a certain magazine show that the proportion of male readers under 35 is 0.40 and over 35 is 0.20. If the proportion of readers under 35 is 0.70, find the proportion of subscribers that are female over 35 years. Also calculate the probability that randomly selected male subscriber is under 35 years of age.

1. A random variable X has the following probability distribution function:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Value of X, x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| P(x) | K | 3k | 5k | 7k | 9k | 11k | 13k | 15k | 17k |

1. Determine the value of k
2. Find P( X < 3) , P( X 3)
3. P ( 0 < X < 5 )
4. Establish the unbiasedness property of OLS estimators for simple linear regression model.
5. State and prove Gauss Markov theorem.
6. Derive by using matrix approach for a multiple regression model.
7. How do you measure the goodness of fit in the regression model.

17. Consider the model with the following observations on Y and X

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Y | 2 | 2 | 3 | 3 | 3 | 1 | 4 | 5 | 5 | 2 |

            The estimated model is =1.933+0.194X; Examine the existence of heteroscedasticity

using spearman’s rank correlation test.

1. Explain lagged variable with an illustration.

Section **– C**

**Answer any two questions (2 x 20= 40)**

1. a) A variable X is distributed between the values 0 and 4 and its probability density function is given by

Find the value of k, the mean and standard deviation of the distribution.

b) Write short notes on:-

1. Nature of Econometrics
2. Structural and reduced forms
3. Applications of Econometrics
4. Given the following data

|  |  |
| --- | --- |
| ∑ Yi2 | 1000 |
| ∑ X1i2 | 200 |
| ∑X2i2 | 100 |
| ∑ X1i  Yi | 400 |
| ∑ X2i  Yi | -100 |
| ∑ X1i  X2i | 0 |
|  | 50 |
|  | 15 |
|  | 10 |
| n | 28 |

1. Estimate the parameter in the equation,
2. Estimate S.E. of estimators,
3. Test the significance of and
4. Find R2.
5. Given the following data test the problem of heteroscedasticity with the help of Goldfeld Quantt test.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Y | 2 | 2 | 2 | 1 | 3 | 5 | 8 | 11 | 12 | 10 | 10 | 12 | 15 | 10 | 11 |

1. Consider the following data on Y, X1 and X2.

Y: 10 20 40 30 50

X1: 2 5 3 8 7

X2: 1 0 1 2 1

a.) Fit a linear model of Y on X1 and X2. Interpret the regression coefficients.

b.) Calculate R2 and interpret it.

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